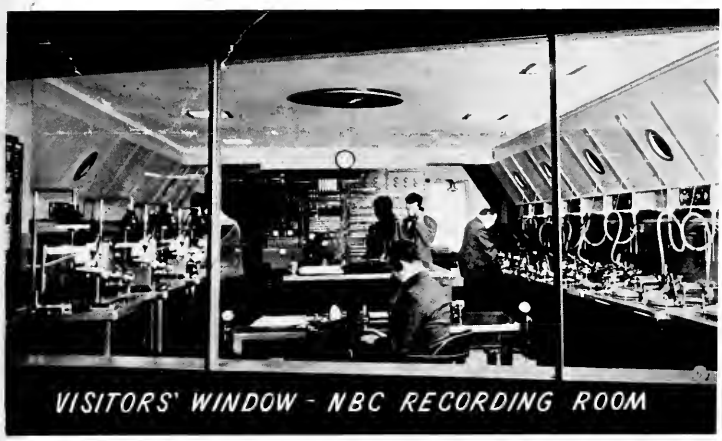
PUBLISHED BY AUDIO DEVICES, INC.

Vol. I No. 1 | 444 Madison Ave., N. Y. C. | July, 1945

A NEW DIGEST ON RECORDING



VISITORS' WINDOW - NBC RECORDING ROOM

NBC's Recording Division Is Carrying Big Load For Many Government Services And Civilians

The Engineering Department of NBC's Radio Recording Division teems with activity. A super-trained staff, including recording engineers, studio engineers and clerks work with some of the finest, most delicate high fidelity recording equipment in the world today. An apprentice in the engineering room is not even allowed to touch a recording machine until he has been trained to handle it.

Research Is Continuous

Improved record quality is the constant aim at NBC. Research and development is continuous and the results are evident in the latest recordings. The full benefit of this experimental work will be felt after the war when more improved equipment becomes available.

Big expansion of studio, technical, and manufacturing facilities is planned, for post-war, according to Recording Supervisor, George E. Stewert. Right now, the recording division is one of the most fascinating places in New York City, and the stream of visitors who gaze through the huge plate glass windows into the engineering room never ends.

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Schirmer's Has Doubled Its Recording Business

Audiodiscs Used Exclusively

"Anything can happen—and does—in a recording studio," says engineer, Bob Hyndman, recording chief for the famed house of G. Schirmer, Inc., in New York. Known the world over as a leader in the Sheet music field, Schirmer has added to that an enviable reputation in recording. Many stellar lights from the theater, movies and radio record their personalities. As a result Schirmer's are scheduling twice as many appointments this year. The main reason for the big increase is the desire of "just plain folks" to make recordings.

"But," went on Mr. Hyndman, "we

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Audio Headquarters Now Your N. Y. Listening Post

The art of making fine quality disc recordings is one of constant change and improvement, one where the correct technique must be combined with a best quality recording blank if true fidelity is to be achieved. With the idea of increasing your enjoyment or profit, Audio Devices is going to send you this digest on recording — approximately monthly.

National Chains Interviewed

To get the most out of your recording blanks, you should know what the experts are doing. For that reason your Audio Record reporter is busily interviewing radio stations, networks, and recording companies. We will show pictures of various plants, pass along advice and "tips of the trade" that you will find interesting and helpful.

Many News Sources

Many surprising sources have stories that will point out new uses for recordings and new and better methods of using them.

For instance, the Office of War Information has a wealth of stories pertaining to entertainment, education, and morale building in our armed forces that we will pass along to you. There are schools and colleges with articles of how recordings are aiding education and with post-war, we will have lots to tell you about family heirloom recordings, family parties and home sound movies.

All Users Considered

We plan to print articles by engineers giving you information on the use and handling of records. Colleges and school educators will give you reports of uses they have made of recording blanks. The dealer angle is also important and will be more so, once priorities are lifted for civilian and private home use. Perhaps you've had an experience others will find helpful—if so, send it along with pictures that will help explain it.

AMPHIBIOUS OPERATION?—Seaman Gerard Grandmont of the Navy and T/5 Maurice Hogan of the Army make a free recording at "99 Park," headquarters of the New York City Defense Recreation Committee, Inc. The booth is sponsored by Gem Razor Company. The hostess mails the record home, morale is upped, and another future civilian knows how to make recordings.

Office of War Information Now Using Recordings To Counteract Totalitarian Propaganda Effects

The task of de-Nazi-ing the many years of German propaganda imposed on French people is beginning to reach its stride in the OWI's Voice of America radio broadcasts. The half-hour radio dramatizations in French of American movies and the 15-minute news stories of American institutions and day-by-day American life are already two outstanding successes. The latter programs are broadcast by short-wave, recorded in Paris and re-broadcast nightly at 11:00 PM Paris time over the French national network (Radiodiffusion Francaise). They are also broadcast directly from OWI's transmitters in New York and London and beamed at France. Both sources are used because the French network was left so crippled by the Germans that it alone is unable to reach many parts of France.

French Cooperation

In exchange for the French network broadcasting OWI's informational programs, the OWI is broadcasting over its own transmitters in New York, London and Europe, a 15-minute French program to these same inaccessible areas. This is the "Ce Soir en France" (This Evening in Paris) show which reports on French political and editorial trends. Both countries are pleased with the results of such an arrangement.

Portugal — Italy

Another program of a similar nature began March 25th to Portugal, called "Answering the Portuguese People," and is sent weekly. This was started because of the interest and curiosity about the United States prevailing in Portugal. Leading educators and writers participate, and recordings are made of the discussions. The subjects discussed range from such queries as to whether American women have the same opportunities as men, to how much information is available on prefabricated houses.

The success of this Portuguese program augurs well because of the "Fan-mail" received from Italy and Spain, two other countries receiving such programs, is mounting steadily.

The OWI Italian show has been so popular that is was recently requested for re-broadcast over the Italian national networks.

Schirmer's Business Doubled

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manage to get a lot of laughs too. Like the quiet little man who had arranged for an appointment two weeks in advance. When all was set, the platter spinning and the signal given, he said not a word but just sat gazing into the mike. Half-a-minute, a full minute—the engineers were going mad, but the little fellow just smiled. After a disc was cut he waved his hand and the same performance was repeated. Three records were cut to this vast silence. Then he asked for a play-back and the entire staff gathered in growing mystification. The little man nodded and moved toward the desk. He paid his fee and smiled happily. 'I'm recording my thoughts,' he said.

A Junior Genius

"Recently, a woman came in with a reluctant looking seven year old boy in firm tow. In demanding tones she asked to try the piano and was seated at the Baldwin in Studio A where she rippled over the keyboard. 'No tone,' she declared coldly. She was patiently led to Studio B where she tried the Steinway. 'No soul,' declared milady. "Finally," said Mr. Hyndman, "I took her into our large studio to another Steinway. Here let me say that Walter Damroch, Ernest Hutchinson, the concert pianist, and Harold Bauer, head of Julliard Music School, all think our pianos are pretty good. Anyway, I was relieved when our customer announced that the third piano would do. After all, an artist is an artist. 'Come Junior,' she ordered. Junior came and plunked down at the Steinway grand. He's going to play 'Anchors Away,' the lady condescended to explain. And tinkle it out he did!"

An Audio Booster!

Mr. Hyndman was enthusiastic about the qualities of Audiodiscs. "You'll be glad to know," he said, "We use Audidisc exclusively at Schirmer. This after having tried every disc on the market. We have sound business reasons for this choice. Frankly, we have fewer complaints, cleaner grooves, and clearer sound with Audiodisc. And we find, after keeping careful check, that Audidiscs have a longer life."

The World on Records

"We do a lot of the colleges. Yale's 'Wiffenpoof's. The Harvard Show. Vassar, Smith, Hunter. About thirty-five of the independent recording companies. As for languages and folk music, you couldn't name one we haven't caught for posterity, from three of the leading Russian groups, down through Arabian, Serbian and many others.

disc-data for the Recordist

Handling Recording Discs

By E. Franck, Research Engineer

The problem of handling and storing recording disks is easily answered. Don't touch the surface and leave fingermarks, either before or after recording. See picture at right. Recording discs must be handled with respect. But don't be like some people who seem afraid to touch one. Easy does it! Pick up the disc carefully with both hands and hold firmly. You can turn and twist it to any angle that way, and I've yet to see one dropped when held right. That's the method our own inspectors follow and they handle thousands daily.

While the storage of recording discs is simple some recordists take fancy precautions which are not necessary and sometimes even harmful.

Store new blanks convenient to the recording room. For a moderate stock, a single tier of strong shelves along an inside wall is satisfactory. For larger stocks, double tiers with access from both sides is best. Select a spot with even temperature. Avoid sunny windows or windows where rain could blow in. It is a good plan when taking a box of blanks from stock to the recording room to open the box in the storage room. This keeps box dust or dirt out of the recording room.

Recorded discs are best stored on edge in individual paper envelopes. A filing number should appear on both disc and envelope. A metal cabinet is the best container but not essential. And don't crowd the shelves. There should be room enough to take discs out without bending or scratching. Avoid putting more than one record in an envelope—the grooves of one may impress marks on the other, if under pressure.

In fact, there are only three rules to follow. Keep away from dust, don't crowd, and store in a place of average temperature and humidity. We definitely do not recommend any type of coating or special cellophane envelopes.

The method of storage we have suggested is based on our own experience for a number of years and that of some of our customers, who find that Audiodiscs produced and recorded in our first year of manufacture still give perfect reproductions.

Close-up of NBC engineer operating recording machine. Also illustrates correct method of handling record.

NBC's Recording Division

(Continued from page 1)

Among the many programs originating from NBC is the official program of the U. S. Army Recruiting Publicity Bureau, "The Voice of the Army," now being broadcast on more than 800 stations and in its sixth year.

V-Discs

Under the auspices of the Special Services Division of the U. S. Army 250,000 records of the latest songs and arrangements by top bands, orchestras and singers go overseas every month. NBC Radio-Recording Division and RCA Victor Division are proud of their contribution to this tremendous morale-building program. Lt. Col. Howard C. Bronson and Capt. Robert Vincent are in charge of V-disc production for the Army. The U. S. Navy also uses V-discs on board ships and at Naval stations.

Many Government Departments Served

In addition to V-discs, NBC notes increasing recording activity for the U. S. Navy, Naval Air Stations, the Radio Section of the Bureau of Public Relations, U. S. Marine Corps, Office of War Information, Coordinator of Inter-American Affairs, U. S. Treasury Dept., War Loan Drives, U. S. Dept. of Agriculture, U. S. Dept. of Interior and U. S. Public Health Service.

Recordings For Independents

National independent organizations using NBC recorded programs include the American Red Cross, National Tuberculosis Association, National Foundation for Infantile Paralysis, "The March of Dimes," and the YMCA, and the NBC Thesaurus service.

ATTENTION READERS!

To be sure you always receive a free copy of Audio Record, fill out the enclosed card—no cost—no obligation and mail it to AUDIO RECORD, 444 Madison Ave., New York 22, N. Y.

This Is Your Publication

You Are Invited To Use It And Shape It To Your Needs

We want this paper to bring you news and information. We also want it to be a friendly little sheet where you will see articles and pictures of yourself—your friends—your customers—and men who are in the same type of business as yourself.

You Are Invited To Help

The sources and interest of any publication depend largely upon the information sent in from its readers. You can help give it the "Personal Touch" we want. Have you had an interesting experience in recording? Have you discovered a new use for recording blanks? A new technique? Have you had an interesting sales experience, or do you know the story of a friend or customer who has? If so, send it in—pictures too. Mail your letters or photos to:
Audio Record Editor, 444 Madison Avenue, New York 22, N. Y.

"Who-Dun-Its" Use Recordings

The mystery was solved by a recording machine! Two of the recent Charlie Chan pictures, "The Jade Mask" and "The Scarlet Clue," produced by Monogram, featured recordings and recording machines. Photo is scene from "The Scarlet Clue" showing Sidney Toler as "Charlie Chan" with Robert Homans.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. I No. 2 | 444 Madison Ave., N. Y. C. | August, 1945

Library of Congress Brings Folklore Music To American Public

10,000 Recordings Available

For the first time the folk music of America, a true expression of American life from romantic cowboy to negro spiritual, is now available to all. For many years the Music Division of the Library of Congress has been collecting American folk music. Mr. John Lomax, Honorary Curator of the Library, through a grant from the Carnegie Corporation, has travelled all over the country with portable machinery and has accumulated a collection of more than 10,000 songs on discs. This collection, one of the largest of its kind in the world, was for a time available only to students who were free to come to the library, or to people who could afford expensive copies. Now, with a complete sound laboratory for duplicating phonographic recordings and for making master recordings which can be pressed and distributed, the National Library is able to bring directly to schools, colleges and the public its wealth of cultural materials.

Field Recordings Excellent

These recordings, made in the field amongst such varied groups as mountain ballad singers, negro prisoners, cowboys, work gangs as they lay the railroad tracks, and sailors as they chant their ballads of the seas and canals, are as acoustically good as the commercial recordings of classical music and drama now available to the public.

Portable Recorders Provided

Six portable field recorders provided in the Carnegie grant will be loaned to qualified students of folklore who wish to record and study the music of their own regions.

Naval Veterans Learning Radio Production While Convalescing at St. Albans Hospital

Out on Long Island, the staff of St. Albans Hospital for wounded naval personnel is doing an inspiring job of morale building. In addition to being provided with excellent medical care, men are, in many cases, regaining lost confidence and are being fitted for post-war jobs in fields they never could have entered but for the opportunities offered while they were convalescing.

Becoming Professionals

One of the most successful programs was organized five months ago when the Educational Services Dept. started its first "Radio—Dramatic" class under the very able direction of Wave Lt. Marianne Heaney, USNR. Attendance to this class is entirely voluntary and is organized on the basis of a workshop. Anyone who wishes to learn or to contribute is welcomed. Among its members are boys with or without experience, but all are interested in the radio aspects of writing, announcing, directing, acting or producing.

Jobs Being Offered

Much of the knowledge the class is gaining is through its more experienced members. For among these "professionals" which the class has been lucky in having at different times—are experienced producers, singers, and recordists. Tremendous advances have been made during the four months the "workshop"

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New York University Pioneers in Recording

Audiodiscs Aid Speech Class

Audiodiscs are used extensively in the speech department of New York University's Washington Square College. Prof. Arleigh Williamson, head of the speech department, has been using recordings as an integral part of his program for over thirteen years and is enthusiastic and keenly interested in its further development in teaching techniques.

Permits Careful Analysis

His department was, Prof. Williamson believes, the first to make use of recording and also the first to use its facilities in ways differing from the more stereotyped. For example, instead of the usual private session in which a student makes a recording to chart improvement in speech, the student actually talks to the class while recording. This gives both instructor and student a chance to analyze the psychological effect of an audience on the speaker's breath control, enunciation, voice timbre, tone, etc.

(Continued on Page 4)

Two American Broadcasting ace newscasters at their mikes . . . George Hicks (right) and H. R. Baukhage (left).

American Broadcasting Co. Finds Recordings Essential Aid To Foreign News Service

The American Broadcasting Company relies heavily on the use of records in transmitting its overseas pick-ups to the network. An important reason for this is the fact that atmospheric conditions change sharply without warning — even during a fifteen minute program. An important news story, coming from overseas, can be completely lost to American listeners due to a change in atmospherics at the time of reception.

Saves Circuit Time

Another vital factor is the time element which can by no means be ignored in these days when other networks, the Army, Navy and Allied Military governments need the overseas circuit. By using recordings, transcribed here in New York at Musak, the American Network can pick up its overseas correspondents on the circuit at a time when the demand is not too heavy. Thus, during the early morning hours, or late at night, American correspondents can broadcast direct to the New York newsroom with a minimum of delay and difficulty. The recordings of these pick-ups are quickly made and can be played over the air while the news is still fresh.

Full Public Acceptance

The management of the American Broadcasting Company's newsroom does not feel that a "transcription" in any way lessens the effect or the importance to the listening public. The average listener does not snap the radio dial button or twist it to another station if he is told that the broadcasting coming up from abroad is a transcription. Further, American officials hold that by judicious use of recordings they can comb out the unnewsworthy reports and keep the broadcasts more interesting.

Whole Nation Heard Hicks

Even those networks who have firm rulings against the use of recordings have been known in many cases to employ news transcriptions. For example, the memorable D-Day broadcast from the Normandy beachhead by American correspondent, George Hicks, was used as a "pool" broadcast by all networks and though the broadcast was not "live," the news certainly was.

Special Broadcasts Repeated

Equally important in the operation of the American newsroom are the recordings made of the "special feature" type of broadcast, as distinguished from regular news broadcasts. A classic example of special feature or special event broadcasting came during the few days following the death of the late President Roosevelt. Recordings were made of all tributes and special programs in honor of our departed leader. Some of these tributes were worthy of repeating, and, in the case of H. R. Baukhage's famed broadcast of Roosevelt's funeral, the record was repeated four times that Sunday.

The American Broadcasting Company has placed an increasing reliance on the use of recordings of its overseas news shows. New York and San Francisco newsroom edition and the correspondents in the field all feel that by careful use of recordings, news dissemination by the American Network can be kept at its high level.

disc-data for the Recordist

Controlling the Thread

By E. Franck, Research Engineer

When a person first sees a recording blank cut, he is usually fascinated by the thread removed by the stylus. In fact, his interest is often entirely centered on the purple thread spinning from the disc. But for the recordist, whether amateur or professional, this thread action is much more than a matter of curiosity. A recording machine in steady use for one hour will produce more than a mile of thread and the way this thread behaves is of real importance.

Thread Action Indicates Quality

In a good recording blank, the thread has a tendency to "kick" strongly toward the center, thus minimizing the chance of it tangling against the stylus. Equally, in a good blank, the thread is relatively free of static electricity and thus can be easily controlled.

When cutting from the inside out, insufficient thread throw is not so noticeable. If there is static charge in the thread, however, there is danger that a loop will jump to the recording head and cause a disastrous snarl.

When the record is started from the outside, good thread behavior is much more important. If the thread throws in from the stylus evenly, then the cutter, as it reaches the piled up circle of thread, will urge it gently inward and only occasional attention is required to brush the accumulated pile toward the center of the disc. If the throw is uneven, the stylus may hit the corner of the pile closest to the grooves and cause a snarl.

Thread Controls Not Foolproof

There are a number of thread control devices which help free the recordist of thread removal worries. But all of these, including the vacuum system used in most professional installations, need good thread action for best results. For example, in the vacuum system, static charge in the thread can cause sticking either at the nozzle or inside the suction hose. If more air is applied to overcome this difficulty, an annoying noise results which prevents good monitoring close to the recording table. The flow of too much air past the stylus into the suction nozzle will also modulate the grooves and result in a high background noise level.

In the early days of lacquer discs, proper thread action was difficult to obtain. Now, the art of recording lacquer formulation has greatly improved and the right thread behavior can be built into the recording blank.

Recording Hobby Wins Friends and Business

New York Executive Points Out Many Uses

Anyone who considers himself busy should meet Jack Schaflein, president of Stone Wright Studios, Inc. His is one of the biggest art concerns in the United States, where dozens of artists and photographers turn out hundreds of catalog pages for such firms as Spiegels, Montgomery Ward and Chicago Mail Order.

Man of Many Hobbies

In addition to running a business, where working until ten o'clock at night is not unusual, Mr. Schaflein finds time to develop new designs and materials in ceramics. In his home and office are paintings of his own creation that have won many awards, including that of the Royal Academy of Canada. Another hobby is his piano, but while he wasn't asked to admit it, it is evident that the hobby he devotes most time to is recording.

Service Men Head List

Stone Wright has many employees in the armed forces, and to them Mr. Schaflein is constantly sending records. He calls in their friends and cuts records that serve as group messages. When any of the boys are back on furlough, he lets them make recordings to send home.

Office Use

Mr. Schaflein finds that most visiting clients enjoy making recordings more than other forms of entertainment. When friends or clients have birthdays or are away on vacation, he will frequently surprise them by sending his greetings in the form of a record.

Home Entertainment

During quiet business seasons at the office, Mr. Schaflein's portable recorder and playback machine makes many trips to his suburban home, where he has amassed a library of personal recordings. In this library is a complete record of the voice development of his four little daughters. Records of neighbors' children have added to the collection, as have those of parties and special occasions among neighbors and friends. Most interesting is Mr. Schaflein's nature study recordings of wild birds that include the thrush, bobolink and robin.

Mosquitoes Lured to Death With Recordings

High Fidelity Discs Disclose Secrets of Insect World

Scientists have long sought an effective means of eradicating disease-carrying mosquitoes. At last Dr. Morton C. Kahn, Associate professor of public health and preventive medicine at Cornell University College, has found a revolutionary method of ridding us of these pests. Dr. Kahn has made use of the age-old lure of the "mate-call" in enticing these insects to their death.

He has successfully recorded mosquito sounds, some of which were completely inaudible, others only faintly audible to the human ear, and is able to transmit these sounds in order to call specific varieties of mosquitoes to a destroying mechanism. The electrical apparatus which was used in these experiments was (1) a microphone, (2) an amplifier of considerably more than usual power, (3) suitable band pass filters and (4) a conventional high quality disc-recorder.

Males Are Sopranos!

The variety of these sounds seem to indicate they may be mating calls or calls warning of danger or anger. The tones of each species, however, are so individual that it is possible to distinguish the different species, and the male and female of the same specie. The sounds recorded to date are in the frequency range of human hearing but far below the energy level required for that purpose. Male "voices" so far recorded are higher pitched than the females.

Only One Voice Needed

The most astonishing observation of this experiment is that the noise of only a single female will cause the males of the same species to burst into an answering chorus. As far as can be determined these sounds are produced in three ways —(1) noises made when the mosquitoes are in flight, (2) the rubbing of the Tarsi against the wing and also certain pure bird-like sounds, the origin of which has not yet been determined. To make these experiments, colonies of the insects are kept in the laboratory and when the recordings are made, the mosquitoes are placed in a soundproof test chamber under conditions of proper temperature and humidity in order to obtain sensitive recordings under a natural environment.

Additional Possibilities

Dr. Kahn hopes that this method may prove useful in the destruction of other insects as well as rats and rodents concerned in disease transmission. A great scientific step forward has been achieved together with new potential uses for the recording disc.

A group of Mr. Schaflein's friends enjoying an "Oklahoma Party." Making recordings was the highlight of the party.

New York University

(Continued from Page 1)

In the speech correction classes, recordings are frequently made of student and teacher speaking together, or two or more students in natural conversation. This encourages self-confidence and allows for a study in comparison.

Aids Radio Training

In the radio course at Washington Square College, which leads to the degree of Bachelor of Arts, recordings are also of great value to both student and instructor. Professor H. M. Partridge makes full use of recording methods in his course in technical problems in broadcasting. Voice recordings for self-criticism are used in the production classes.

Shortens Apprenticeships

Students at New York University have the advantage of the greatest city in the world as their "campus." At Radio City Music Hall, the "Met," and in the legitimate theaters they find unending productions to spur them on to further studies in the fields they hope to enter. Happily the faculty who channel the ability of these young people are awake to the vast potentialities of recordings as a means of acquiring confidence, poise and balanced personalities, qualities which pay big dividends in the highly competitive world of today.

Navy Veterans

(Continued from Page 1)

has been operating. Already some of these boys show real ability, and one of them has been promised an announcer's job with a major network.

Helping Red Cross

Recordings are playing a leading role in giving the boys "mike" experience and in helping with speech correction. The first big project of this group was a Red Cross show completely put on by the patients, recorded at the hospital and broadcast over WQXR in New York City.

Active on War Loans

Much of the fine writing of these boys has come out of relating their actual war experiences. They were active in working on a contest for the best script for the last war loan appeal. And they have the huge satisfaction of knowing that even though wounded they can still contribute to the war effort. It augurs well for the fields of recording and radio that after the war there will be so many interested and capable young men available for them.

This Is Your Publication

You Are Invited To Use It And Shape It To Your Needs

We want this paper to bring you news and information. We also want it to be a friendly little sheet where you will see articles and pictures of yourself —your friends—your customers—and men who are in the same type of business as yourself.

You Are Invited To Help

The sources and interest of any publication depend largely upon the information sent in from its readers. You can help give it the "Personal Touch" we want. Have you had an interesting experience in recording? Have you discovered a new use for recording blanks? A new technique? Have you had an interesting sales experience, or do you know the story of a friend or customer who has? If so, send it in—pictures too. Mail your letters or photos to:
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The show is recorded as it "goes on the air" at Hunter College. Student assistants are responsible for timing and giving "cues" to cast. (Dr. Callahan, instructress, at recorder.)

Hunter College Students Prepare for Radio Careers

Popular Courses Given In Modern Radio Technique

Radio Broadcasting is receiving major attention these days at Hunter College of the City of New York. This famous woman's college, located in the swankiest section of New York's swank Park Avenue, is looking ahead, and according to the head of the Speech and Dramatics Department, Professor Marguerite E. Jones, students are eagerly exploring every department of radio, from engineering to acting.

Audiodiscs play an important role in this educational program; original scripts are recorded; classes in radio dramatics record their plays; and the records are then played back for class criticism. Students in the technical courses handle the production of all transcriptions and thus a dual purpose is served.

A complete broadcasting studio is located in the college building, and the control room is a model of efficiency with

(Continued on Page 4)

It Was Cool in Chicago!

The mellow, soothing baritone voice of Harry Cool had been heard over several network shows, and had been recorded on audition transcriptions for submission to several prospective sponsors. Finally a well known manufacturer of a certain famous brand of cigarettes was interested. Seated around a certain advertising agency's loud speaker while the discs were being played, representatives of the agency, the network and executives of the cigarette company were enjoying themselves—until the president of the sponsoring firm asked the name of the singer.

"Cool. Harry Cool," said the agency man, smugly.

"What!" The president yelled, "have a fellow named Cool on our show? Why we'd sell more cigarettes for Kool than we would for ourselves!"

The lad **must** be good!

NBC Doubles Staff of Recording Division

Plans Promotional Program on Lateral Recording Superiority

Throughout the war the Radio-Recording Division of the National Broadcasting Company worked unceasingly with the War, Navy and Treasury Departments, the Red Cross, the OWI, OIAA and other Government agencies in the production of thousands of records for rebroadcast both on the home front and all over the world. It was expected that when the war was over, the staff replacements for those called into military service would surrender their jobs when the boys came back—however, activity on the seventh floor of NBC in New York has been stepped up to such an extent that in addition to more than doubling its wartime engineering facilities, the recording division next month will have increased its sales staff by more than 100%.

While operations are being increased in all branch offices the greatest activity is taking place in New York where all productions emanate. The most important technical improvement the division will have achieved will be having its own processing department, hitherto taken care of by RCA's Camden, N. J., production department.

The syndicated programs now total 21 and the NBC Thesaurus recording library numbers 5,000 selections; the department is presently programming several new syndicated shows.

Many Radio Recording Division engineers are currently calling on station engineers throughout the country, proving by actual tests the superiority of lateral recording over the vertical; they are demonstrating that the lateral system is less prone to produce distortion, claiming a range up to 15,000 cycles. The Columbia Broadcasting System, Standard Radio and other producers of transcriptions are joining NBC in this extensive educational program, and it is felt that the change to lateral recording will greatly improve the quality of transmission, particularly over Frequency Modulation transmitters.

Sumner Welles to Record New Program

Much interest is currently being displayed across the country in the forthcoming series of transcribed weekly talks by the former Undersecretary of State Sumner Welles. Welles has long been known as a stormy petrel, and his dismissal from his post by then Secretary Cordell Hull, is attributed to his penchant for speaking his mind. By recording his weekly talk, Welles hopes to avoid the censorship which he believes his talks may be subject to if delivered in person.

According to the William Morris agency, which made the deal, Welles will transcribe his comments on current affairs from wherever he may be each week, and the recordings will immediately be airmailed to subscribing stations.

Welles has had several previous offers to be heard on the air but has refused them heretofore as he felt that his comments might necessarily be such as to inspire censorship, and for this reason he would not be able to express himself. It was felt that transcriptions offered the best way of avoiding that possibility.

disc-data for the Recordist

Measuring Wear in Recording Blanks

By E. Franck, Research Engineer

Wear in recording blanks, like inebriation, is largely a matter of definition and both subjects are controversial.

Wear means different things to different people. A professional recordist will consider a recording worn beyond use as soon as he can notice an increase in noise level, a loss of high frequency response, or any form of distortion audible to his trained ear. A non-critical home recordist, with his less exacting equipment, would not be conscious of wear that would make a recording worthless professionally.

Test Equipment Available

High frequency loss with repeated playing is perhaps the easiest way to attack the wear problem. A high frequency of substantial level is cut, preferably at the smallest groove diameter to be used. This groove is played back repeatedly and the level watched on a meter, the number of playings required for a given decrease being an index of wear. This method is good for comparative measurements but cannot be used over a long period unless the cutting and the playback stylii are standardized. One advantage of this method is that the equipment required is usually available anywhere that blanks are cut.

Measure Noise Level

Increase of noise level on repeated playings is another method of measurement. This requires a set-up capable of measuring noise level as described in our column last month. Unmodulated grooves are cut, the noise level is measured, and the grooves played repeatedly until the noise level increases an arbitrary amount. 6 db is a convenient increase. The number of playings required is reduced by weighting the pickup and we find that with 2¼-oz. weight at the playback point from 100 to 200 playings are required to "wear" a good lacquer. When many measurements must be made, it is a time saver to position the pickup so there is no side pull, at the testing diameter so that when the end of a groove is reached, the pickup will slip back into the adjacent groove and repeat over and over in the last groove. A slight tilt to the turntable may be needed. Of course, when the pickup climbs over the wall there will be a terrific noise produced and the output meter needs to be protected at this instant. A telegraph key short circuiting the meter is a convenient way of doing this and with a little practice the noise can be measured over almost a complete revolution day after day with only an occasional accident to the meter.

Another Method

One logical objection to the above method is the use of unmodulated grooves, although any rise in noise level is first detected where there is no modulation. A different method of measuring wear employs modulated grooves. A full level tone of from 70 to 90 cycles is cut, and played back through a high pass filter. The filter, if it is a very good one, will take out the fundamental and all the various harmonics, leaving the noise which can be measured. Wear is again taken as the number of playings which produces a 6 db increase. Tests made this way usually give readings from 60 to 80% of the unmodulated readings.

Temperature is a big factor in wear measurements, wear going down or up with temperature, except in the high frequency loss method where the loss may be faster at higher temperature.

Most lacquers have a good progressive wear characteristic but some will be found where the grooves become suddenly useless, as though they were breaking down completely instead of wearing gradually.

Our general experience has been that whatever method is used, the results are about the same. Five different lacquers measured by any of the three methods would keep their same relative positions.

ATC Vet Returns To Audio Devices

The manufacturers of AUDIODISCS, Audio Devices, Inc., 444 Madison Avenue, New York, proudly announce the return of Captain C. C. Pell, Jr., to their organization as national sales manager.

Captain Pell, during four years of service as an Army Transport Command pilot, completed fifty-five Atlantic and four Pacific crossings. Other flights carried him to South America, Africa, India, and the Middle East.

An outstanding athlete, Pell gained national fame by teaming with Bobby Grant to win the U. S. Amateur Racquets Doubles Championship in 1936. The pair retained the title through 1941. No tournaments have been held during the war years.

Mr. Pell's duties with Audio Devices will also include flying. Using his own plane, he will contact representatives and distributors in over 200 cities throughout the United States and Canada. Customers, such as radio stations, motion picture studios, professional recording studios, phonograph record manufacturers, schools and colleges, also, will be included in these cross-country jaunts.

Zero Audition Gets Warm Greeting

Audiodisc Lacquer Saves Day

It gets hot down there in New Orleans —it gets cold up there in Chicago; but neither heat nor cold can destroy the efficiency of Audiodiscs according to a story told by J. D. Bloom, who is chief engineer of New Orleans' popular WWL.

Last winter the station's commercial manager, Larry Baird, developed a local program which he believed would be successful for a certain product he had in mind. Since the product was represented by a Chicago advertising agency, an audition recording of the show was made on a glass-base Auriodisc. Unwilling to trust the transcription to the mails or to the express company, Mr. Baird tucked his record under his arm and off he went to Chicago to deliver it personally.

Brrrr

It happened however that Chicago was enjoying one of the bitterest cold waves of the winter, so on his way to keep his audition appointment, Mr. Baird rode in a heated cab; but when he reached his destination, stepped out into the zero temperature and paid his fare, he was horrified to hear an ominous cracking sound in the box he had nursed so carefully under his arm, a sound that could mean only one thing.

The Show Goes On

Nevertheless the appointment must be kept and entering the agency he ruefully informed them that his trip was in vain; the sudden change in temperature between the heated cab and the sidewalk had caused the record to crack. After some discussion of the program, they decided to attempt to play the record anyway, and to everyone's surprise the reproduction was unharmed! The lacquer coating on the record had remained undamaged even though the glass-base had broken.

Mr. Bloom reports that WWL has been using Audiodiscs exclusively for about four years.

P. S. Mr. Baird sold his program!

Editor's Note: Yes, glass-base discs can crack and sometimes the story does not have the good ending Mr. Baird experienced. Yet, glass has proven a marvelous substitute for aluminum during the war. Now, many recording engineers tell us they prefer the glass-base to aluminum. We should be glad to hear from others on this subject. What type of base do you want, and why?

Name Stars Record Educational Dramas

Stations and Schools Welcome Program

The tenth series of broadcasts to be offered by the Institute for Democratic Education is now being made available to independent broadcasting stations throughout the United States, Alaska, Hawaii and Puerto Rico. The institute, which is a non-profit organization dedicated to the promotion of racial and religious unity, loans the transcribed series free to stations for broadcasting on a public service basis.

Thirteen programs have been recorded in this series, entitled "Lest We Forget These Great Americans," and based upon the success of the nine series which preceded it, this should be accorded an overwhelming reception. Featured on the series are Melvyn Douglas, Wendy Barrie, Myron McCormick, Sam Jaffe, and others. Personages whose lives are dramatized for the series include Franklin D. Roosevelt, Woodrow Wilson, Wendell Willkie, Alfred E. Smith, Jane Addams, and the late Justices Brandies and Holmes.

Under the direction of Dr. Howard M. Lesourd, Dean of the Boston University Graduate School, the Institute for Democratic Education has done much toward developing a higher appreciation of the democratic heritage and a wholehearted support of free institutions. Working steadily and tirelessly for the past seven years, and realizing that radio is primarily an entertainment medium, it has presented its series of educational transcriptions in dramatized forms, featuring many of the most prominent stars of radio, stage, and screen. Each series of thirteen programs has been entitled "LEST WE FORGET," and more than four hundred stations throughout the country and its possessions have already broadcast the shows.

Schools throughout the nation have been quick to see the advantages of these programs, and at the present time over 1500 schools and school systems are using them in history and current events classes. They find that the dramatizations give added reality and meaning to historical episodes and periods, arousing interest and stimulating discussion among pupils. An eight page booklet "Portfolio of Freedom" is distributed without cost to schools for classroom distribution. Records and booklets are supplied without cost, to schools owning public address systems or playback machines.

Financial support for the institute is obtained through private contributions from liberal educational and civic organizations.

(Continued from Page 1)

RCA equipment throughout. Classes in radio dramatics are held under the instructorship of Mrs. Harvey, Mrs. Callahan, and Mrs. Landeck, all of whom have had practical experience in radio in addition to a thorough grounding in educational theory.

Kids Get Big Chance

One of the most ambitious courses which will be included in the Spring curriculum is Radio for Children, a course designed for students interested in children's radio programs; it includes the adaptation of scripts for children; the casting, directing and producing of programs with child actors. Students in this course will also be given instruction in control room technique and the synchronizing of sound effects. Children from Hunter College Elementary School will comprise the repertory group of child actors.

During preliminary practice, this young actor, taking his part very seriously, studies the new personality.

Grads Make Good

Graduates of the existing courses have been singularly successful since leaving school. Advertising agencies, radio stations, recording studios and other schools and colleges have been quick to recognize their talents.

Professor Jones is especially pleased with the use of transcriptions in many other ways in the College—in speech correction classes; in public speaking and oral interpretation courses; in voice and phonetics exercises; in the music department.

Speech Handicaps Aided

Stammerers, and others with speech impediments are given corrective exercises with the use of both the "voice mirror" and recordings and a more rapid advancement has been noted when students are able to follow their own progress. The same is true of the other courses in the Speech department. In the music department of the College, under the direction of Dr. Walter Helfer, extensive use is made of the recording machines. The radio studio is also used by the Music Department for a course in broadcasting for singers.

Professor Jones predicts that an even broader use will be made of transcribing facilities at Hunter College in the very near future not only by the Speech and the Music Department, but by the many other departments that have already discovered its value.

Reporters Wanted

You Can Qualify For This Exciting Position

The current issue of AUDIO RECORD is Volume I, Number 4—we hope it has brought you a measure of entertainment, that some of the information we have been able to bring you has been interesting and useful to you. We want this paper to be of even greater use, and this can be made possible through your own cooperation.

An exchange of information can be of mutual assistance in these times of rapidly changing techniques in all lines of endeavour, and this is particularly true of the recording field. AUDIO RECORD can be a medium of such exchange and we will be only too happy to keep our columns open to our readers. The daily life of a recording engineer is filled with many incidents, some of them amusing—such incidents often make interesting reading. Perhaps you have a success story to tell which may be an inspiration to others.

In other words, AUDIO RECORD needs reporters; it can continue to be interesting only if you wish it to be. Send your letters to: THE EDITOR, AUDIO RECORD, 444 MADISON AVENUE, NEW YORK 22, N. Y. If you have interesting photographs, send them along, too! We'll print 'em!

PUBLISHED BY AUDIO DEVICES, INC.

ol. I No. 5 444 Madison Ave., N. Y. C. December, 1945

NOVEL RECORDING SHOW—BROADWAY HIT!

Scene from Broadway's "Date With A Disc" show, showing M.C. Enoch Light, Eng. Fritz Herbert and Danny Sullivan, band vocalist.

EFT — Loew's State Theatre poster. RIGHT — Photo of applicants signing-up for show.

Date With A Disc Packs 'Em In

"*Date With A Disc*, the new and different audience-participation show, now appearing at the Loew's State Theatre in New York, will uncover the Crosby, Sinatra, Shore and McDonald of tomorrow," says genial, music master Enoch Light, creator of the disc show that promises to keep Broadway "recording conscious" for many months to come. "Not only does *Date With A Disc* tickle your funny bone but it offers a real opportunity for the young fellow or girl with talent," Enoch relates.

Hit From The Start

Date With A Disc was first introduced to the public in the Bowman Room of New York's fashionable Biltmore in December 1944. It was received with such great enthusiasm that maestro Light decided to take it along with the band to test its appeal in Philadelphia, Providence and other eastern cities. It was the same, everywhere. *Date With A Disc* was a hit! And today, one year later, *Date With A Disc* is "in solid" with the Light musical aggregation. As the boys in the band put it: "Let there be Light and there is *Date With A Disc.*"

Mutual May Air Show

Soon it is hoped that *Date With A Disc* will be aired for the first time over WOR, New York's Mutual outlet. If it is, radio listeners are in for a real listening treat and will no doubt make *Date With A Disc* a "must" on their radio schedule.

As explained by Mr. Light, *Date With A Disc* is not a quiz show, but, it presents the same all-out appeal as the toughest sixty-four dollar question. The old familiar "no coaching from the audience, please," "isn't heard. Principally, because it isn't needed. In this game you're strictly on your own!

Contestants Drawn From Audience

The contestants for *Date With A Disc* are chosen from applications previously filled-out by the individual upon entering the theatre. The application

(Continued on Page 3)

WOR Recording Studios—Second to None

New York's Mutual Outlet Handling Tremendous Recording Load

Taking their place as one of the major rganizations in the business, the WOR ecording Studios are now doing a large ercent of all commercial recording in ie New York area. Located on the 3th floor of 1440 Broadway, the WOR ecording Studios facilities are used by usiness concerns from as far west as hicago. Over 50 percent of the studios' ork is handling commercial transcripons for most all of the major advertisig agencies in New York City.

Program Popularity Checked

The WOR Recording Studios also aintain a reference recording room or the purpose of making air checks for dvertising agencies. One third of the ork of the reference recording room onsists of making discs for rebroadast—for WOR as well as for other ations in New York City.

"The Sealed Book," syndicated radio rogram series produced by WOR's ommercial Program Sales division, is ecorded at the 1440 Broadway studios or transcription use all over the United States as well as in Canada and Hawaii.

Package shows, information and industrial series, propaganda messages and programs for governments in exile during the war, commercial transcriptions, special sound effects records—all have been recorded in the WOR studios.

Best Equipment Available

The WOR Recording Studios, which were opened in June, 1942, represent the latest word in recording facilities. The studios are modern in design and offer the latest in acoustical properties, lighting installations and recording equipment. The entire division is air-conditioned providing favorable working conditions regardless of outside temperature, and assuring uniformity of recording equipment operation.

The studios were designed under the supervision of sound control experts. The walls are built with obtuse angles which control reverberation and help eliminate sound reflections without the loss of desirable brilliance so necessary

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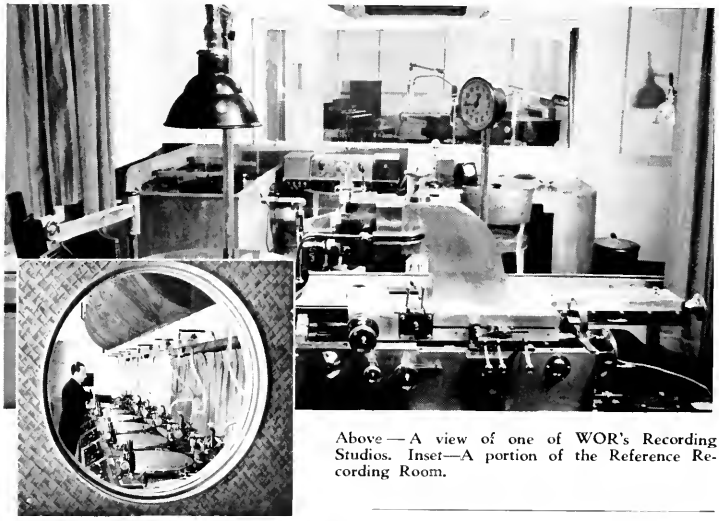

Above — A view of one of WOR's Recording Studios. Inset—A portion of the Reference Recording Room.

WOR Recording Studio

(Continued from Page 1)

to the production of high fidelity recordings.

The control rooms have specially designed Holophane lighting installations providing the ultimate in visual aid; the vision panels are set at angles which reduce glare, and each control room is equipped with a three-way talk-back microphone.

The recording machines themselves are the finest available—Scully Recording Lathes. Two of these are located in each of the two recording rooms; immediately adjacent to the control rooms of the studios. They are so arranged that a vision panel enables the recording engineer to look directly into the studio.

Eighteen Channels

The studios have eighteen channels available at all times; twelve of these are located in the reference recording room. These channels are chiefly used for recording programs "off the line" or "off the air." All eighteen channels are quickly interchangeable.

Re-Recording Equipment Set Apart

The re-recording equipment is installed in a specially designed and acoustically treated room which is isolated from the rest of the studios. The equipment consists of four dual speed, constant velocity, turntables and reproduction is achieved through the use of four high fidelity lateral-vertical reproducers.

For master re-recording a special

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What!! 1:30 A. M.

The Scene: The offices of the recording studios of PHOTO & SOUND, INC., San Francisco, Calif. John Wolfe, manager of the recording division, is at his desk.

The Time: Around 6:30 in the evening a day or so after Pearl Harbor.

The telephone rings, and a voice says, "This is the COI. We'd like to make a recording at 1:30 A. M. Can you handle it?" Wolfe, at first a little annoyed at what appears to be a practical joke, explodes, "What!! 1:30 A. M.! Who's trying to kid who? Whoever heard of making a recording at 1:30 in the morning! Our technicians have all gone home!" The reply comes quickly, "I assure you, nobody's kidding anybody. I am speaking for the Coordinator of Information, and it is absolutely essential that we make a highly confidential recording tonight. Can you do it?"

And so, in the dead of night, with the representative of a government agency so new few people had heard of it, with a school teacher, and two Japanese students from the University of California as talent, and with the manager of the recording division at the cutting lathe, PHOTO & SOUND, INC., made the first transcription to be used in our short-wave propaganda battle with the Japanese Empire. This was the first of a long line of transcriptions prepared for use by the COI, later to become the Office of War Information. During the ensuing year, the OWI utilized Photo & Sound's recording studios to the hilt. Twenty to 24-hour days were nothing

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Hearing Is Believing

Discs Aid Voice Coach

"To point out the shortcomings of a singer is one thing, but to convince him of those shortcomings is another," says Kenneth Hieber, New York voice coach and accompanist. "To tell a student that his diction is weak or that there are "wobbles" in his voice isn't easy, because the average student must have his voice recorded and played back to him before he fully realizes the importance and seriousness of his mistakes. One play-back does the work of many hapless hours of lecture," Mr. Hieber relates.

Juilliard Graduate

At present, Mr. Hieber, who attended the Longy School of Music and has been graduated from the Juilliard Institute of Musical Art, occupies a modest little studio in Greenwich Village where he tutors fourteen anxious and hopeful singers.

Busy Week

Mr. Hieber prepares Mary Agnes Davis for her March 23 Town Hall concert.

Aside from his studio work, Mr Hieber spends two days of every week with his students at the world renown Juilliard School, serving as piano accompanist to faculty member Evan Evans, well-known Gotham voice teacher; and one evening, Monday, with one of his proteges in the forty-third street recording studios of G. Schrimer.

Errors Isolated In Play-Back

During these Monday evening appointments, for which the student has prepared several selections that will, in most cases, be presented in a forthcoming examination or public appearance, four to six sides are cut and played back. The student is counseled after each play-back and the merits of the recording are discussed in length before the next disc is cut. In this way, the student may concentrate on weaknesses in diction, individual vocal problems (wobbles, lack of line, lack of sufficient color), or lack of rhythmic flexibility. Also, Mr. Hieber uses the pupil's recorded performance as a measuring guide for their progress over a period of time.

After the discs have served their purpose to the individual, they are usually given to proud parents or admiring friends as souvenirs. And, confides Mr. Hieber, "they're AUDIODISCS."

Date With A Disc

(Continued from Page 1)

form merely asks for the contestant's name and whether he or she will sing, yodel or give an oratory piece if called to the stage by program M. C., Enoch Light. Three applications are drawn from a ballot box and the lucky selectees are brought to the stage. They are first introduced to the audience and briefly interviewed by Light, then, program engineer Fitz Herbert signals that his equipment is ready to record the applicant's efforts. If the contestant is a singer (most of them are), the orchestra begins the introduction and the vocalist is on his own. After all three contestants have finished their performance, engineer Herbert sets up his equipment for the play-back, and the fun starts. One by one each hopeful listens intently as the disc starts on its merry way. With each revolution it is clear to see that the anxious fellow is thinking: "that ain't me." Ater the play-back is completed, the audience, by applause (recorded on the applause meter), selects the winner.

In There Pitching— Elderly contestant gives forth with his "Sunday Best."

Everyone Wins

Unlike quiz shows, all contestants win prizes. For example: the second and third place performers receive either a bottle of perfume or a handsome leather billfold. The winner: a fifth of Manhattan's best champagne. In addition, the recorded discs are given to the "also-rans" as souvenirs of their *Date With A Disc*. The winning contestant's disc is retained by a board of four judges along with those of other show winners.

As *Date With A Disc* is now being presented five times daily, to capacity audiences, each day brings five new winners to the fore. At the end of a week's engagement, thirty-five individual show winners have entered the "choice company" class and their discs are again replayed by the board of judges, headed by the well known radio personality, Martin Block, to determine "the best of the lot." This selection results in the winner receiving an elegant gold wrist watch. But, that isn't all! His or her disc will be retained for a period of three months, at the end of which the board selects the best disc recording made during that time. The

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In Braille and Talking Book Library of New York Institute For The Education Of The Blind, Robert Lovejoy, 12-year old student, is shown operating the Talking Book machine and listening through the privacy of his own ear-phones to a recorded copy of the Readers' Digest, while Jenny Lamanna, right, reads from her Braille copy, and Marie Gasperino, left, is being read to by the librarian, Miss Marjorie Schweitzer, from the regular ink-print copy.

Talking-Book Long Step Toward Brighter Future For Blind

"The 'talking book' (educational text recorded on 16" discs) and recordings in general bring a new approach and new methods of teaching through sound," says Dr. Merle E. Frampton, Principal of the 114 year old New York Institute For The Education of the Blind, The Bronx, New York.

"With the advent of the Talking Book has come a broadening of the educational and entertainment opportunities for the blind. Although, still in its infancy with many possibilities for its perfection and use yet to be explored and developed, the Talking Book has already become a potent force in the schools and homes of the blind across the country. Second only to radio as a medium of enlightenment and recreation, the Talking Book marks a golden mile-stone on the road to greater freedom from dependence upon others; for, with a flick of a switch, its magical turntable will spin a story drawn from the literary masterpieces of history or from the current best seller now on the shelves of the corner book-store. Adding to the enjoyment of the Talking Book is its voice, a professional story-teller, often the author himself—an experience denied the ordinary reader.

"Recordings which have captured the sounds of wild life in their natural habitats contribute a realism to courses in nature study and other kindred subjects heightening their interest and effectiveness. Through the recording, the listener can be a witness to great moments of history and science and can learn first-hand of the audible attributes of the natural wonders of the world. The wide range of possibilities for the educational and classroom use of recordings is challenging to the imagination and a stimulating subject for study and research.

"The ever-lengthening Talking Book shelves in libraries for the blind guarantee new sources of knowledge and entertainment to light and lighten the lives of the blind everywhere."

With the help of congressional appropriations, the Talking Book is recorded for the New York institute by the American Foundation For the Blind in New York City.

As Old As Methusela Maybe?

Recording of sound is not as recent a phenomenon as most people believe. Just how old recording actually is, probably, will never be determined. However, Plato, 500 years B. C., in his "Republic" mentioned having heard recorded sound. Also, the memoirs of Luigi La Blache (1794-1858), greatest basso of all time, hinted that he had heard his own voice through recordings made many years before.

Rock-A-Bye Baby

Working late in Columbia's forthcoming "Gilda," Rita Hayworth, glamorous screen star, hasn't had time to sing to her baby, so she's recorded lullabies for her nurse to play at the child's bed-time.

Engineer Jack Hawkins monitors a program in the main studio of Photo & Sound, pioneer San Francisco recording studio.

What!! 1:30 A. M.!!

(Continued from Page 2)

out of the ordinary, and for a time, 120 sides a day were being turned out. Nearly all of this was prepared for short-wave transmission to the Orient—in dozens of languages and for hundreds of different purposes.

When the Office of War Information found it feasible to go into recording for itself, its program at Photo & Sound was curtailed, but other recording, associated with the war effort, continued to consume much of the available studio time—transcriptions for the Army, for the Navy, and for the training films being produced by the Film Production Division of the company. As the war effort has tapered off, more and more time has been available for peacetime effort—agency transcriptions for broadcast purposes, personal recordings, and commercial recordings for public release. Now that the war is over, Mr. Wolfe looks forward to a greatly expanded program along these lines.

The recording division takes a justifiable pride in its record of past accomplishments, and looks forward to a bright future. With a staff of topnotch technicians, and the latest in modern recording equipment plus the unfailing quality of AUDIODISCS, which are used exclusively, it is in position to handle everything from, "Hello, mama, this is Joey. I'll be home for Christmas" to symphony recordings or the many-sided problems of sound effects, narration and dialogue arising in motion picture productions.

WOR Recording Studio

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studio has been built containing two Scully recording lathes. The studio includes an audio control console with vertical and lateral reproducing channels with associated equalizing systems.

One of the most important factors in present day recording practice is the blank disc itself. In WOR'S studios these discs are kept in specially constructed cabinets until required for use. The temperature is kept constant, thus insuring a uniform cutting medium at all times. Henry B. Lockwood manages the WOR Recording Studios.

Date With A Disc

(Continued from Page 3)

winner is awarded a contract with Guild Records. Results of the pressing may mean the start of a brilliant career for the lucky boy or girl. Only recently, Miss Dorothy Malone of Collingswood, New Jersey, was adjudged the best performer heard during the previous three month period and was given a contract as featured vocalist with Mr. Light's orchestra.

AUDIODISCS are used exclusively in the presentation of *Date With A Disc*, and Mr. Light advises, "they never let us down."

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2 No. 1 | 444 Madison Ave., N. Y. C. | January, 1946

"G.I. Journal" cast—Left to right—Mel Blanc (Pvt. Sad Sack), Rita Hayworth, Charlie McCarthy and Edgar Bergen.

Armed Forces Radio Service Expands Networks Into Areas of Occupation for '46 Operation

The Armed Forces Radio Service will continue as a military operation of the War and Navy Departments into 1946. Thus, armed forces overseas are assured a continuous supply of AFRS programs via shortwave beams originating from San Francisco and New York City, Armed Forces Radio Stations located in the immediate vicinity of troops, and via AFRS transcriptions for playback aboard ship and over landbased sound systems.

Webs on Peacetime Standard

The global broadcast outlets of the AFRS are still in daily operation overseas meeting the increased needs of soldiers, sailors, and marines for information and entertainment through radio. GI networks have been converted into peacetime status by expansion into areas of occupation. The "Far Eastern Network," under General MacArthur, extends from New Guinea through the Philippines into Japan. The "American Forces Network" formerly servicing troops in the British Isles and France has expanded its outlets into Austria, Germany, and Italy. Down in the South Pacific the "Mosquito Network" still has stations in operation from Guadalcanal to Samoa. Other AFRS Stations continue to function in the Middle East, the Aleutians, Panama, South America, Iceland, Greenland, India, Burma, and China.

L. A. Headquarters Maintains Pace

To meet the needs of such AFRS outlets, the Armed Forces Radio Service plans to continue its production of broadcast material at

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Church Women Plead For Enduring Peace

Recordings Heard by Thousands

The first Friday in November was observed nationally as World Community Day by the United Council of Church Women, an organization representing 10,000,000 Protestant women of all denominations. Their theme which they went at in earnest was "The Price of An Enduring Peace."

Program materials for the day went into 11,000 communities in the United States. Local groups in these communities put in weeks of study and preparation. These women knew they had to begin building world peace by getting understanding and tolerance for all peoples in their own communities.

National Leader SFPC Representative

To penetrate hearts and homes with the responsibility upon every individual for making the United Nations Charter live in a real United Nations Organization these women went on the air. Mrs. Harper Sibley, their national president, had been one of their representatives at the San Francisco Conference.

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World's Future Dependent Upon Modern Education

Students Point Way to Better, Easier Learning

Today, scientists tell us, we're living in the "atomic age." We're living at a time when the future of the world depends on sincere, successful thinking, and modern foresight by leaders of all nations. Modern foresight requires men with modern ideas. And, modern ideas, in turn, are the result of modern education.

As the reputation of the United States has long been without peer in the field of education, it is not difficult to understand why modern educators are tirelessly planning new ways of educating the American boy and girl. No doubt, your Mary or my Bill, will learn their ABC's as you and I, but, chances are, the alphabet will be presented to them in a new, streamlined way, a modern way. In other words, the youngsters of tomorrow will find school far more interesting and less arduous than was the case when we attended the little red school house on the hill. He or she might even find school to be "fun." At least that's the hope of the modern educator.

Better Citizenship Training Mapped

An example of what is now being done to make "going to school" a pleasure, is told in a report received from Mr. W. Howard Bateson, instructor in American Citizenship and in charge of Visual and Audio aids at Jefferson Junior High School in Dubuque, Iowa. Mr. Bateson, associated with audio-visual education in schools and commercial theaters for over twenty years, believes audio-visual equipment to be one of the prime factors in education's progress. "I am firmly convinced that this country is now to go forward into a new and greater field," Mr. Bateson exclaims. "This field, it seems to me, will be directly related to the school, the church and the local theatre. These institutions will provide the means for integrating all of the resources of the community for better citizenship training.

"Recently," the professor continues, "the students of my classes exchanged scrapbooks with the pupils of a junior high school in Georgia. In acknowledging receipt of the Georgia school's scrapbook, our students decided to send a recorded 'thank you' note. In the recording, they further explained many of the things in the Iowa scrapbook in order to give the Georgia pupils a better understanding of the history and resources of our city and state.

Streamlined Education

"Not only did this single recorded disc bring more information, pleasure and enjoyment to the Georgia group but it served to introduce them personally to the boys and girls who had prepared the Iowa scrapbook and whose photographs appeared in its pages.

"I know of no better way to teach history, geography and human relations than through a well planned recorded disc exchange project, supplemented by sixteen millimeter motion

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"Hi, Dad De!"—William Hillyer McDonald, with Mom, send greeting to Capt. McDonald, overseas.

USO Recording Service Proven Morale Builder

War Record Unparalleled

Popularity of "live letters" made on voice records at USO clubs is attested by the fact that USO Central Purchasing Department has sent out 301,059 discs for records in the last two years, and that this figure is exclusive of those purchased locally or through other channels.

All discs purchased by USO are donated to service men and mailed out by individual clubs. Some 350 USO clubs in large cities are equipped with voice-recorders, and men en route overseas during the war years or returning today have used these machines to send messages to their families.

But sheer statistics do not tell the human story behind this USO service.

Nation-wide reports indicate some of the companionship and warmth behind the making of these recordings.

Many Languages Recorded

A USO club director in Tacoma, Washington, wrote during the height of the war:

"Made recordings tonight for men of five nations. A choir boy from Russia chanted a message to relatives in New York City. A soldier from Free France who'd escaped to the United States and joined up here made a recording for his uncle in California. A Christian Arab sent one to his aunt in San Francisco—a Jewish boy from Palestine ever so shyly said a few lines to his sister in El Paso, Texas. An Irish lad from County Cork, Ireland, sang an Irish ditty to his grandfather in Wisconsin—and a chap from Corsica did one with an Italian flavor."

The voice records are usually made in a large room, so that there is always an interested crowd of kibitzers around. But any man wanting privacy for a special message may take the machine into the club director's office and make it without having a crowd listening to him.

Dan Cupid Given Hand

This is especially important in such instances, for example, as the time when a man proposed to his girl by voice record. In fact, sweethearts and wives receive a fair share of all these messages. Sometimes a man will sing a love song to his girl. And in a USO club in Ozark, Alabama, a red-haired Texan stopped in to say that his girl had turned him down. He made a voice record, singing "You've gone and left me all alone," and sent it to her family. Evidently his appeal was moving, for he became engaged to the girl soon after that.

Mom Not Forgotten

Thousands of men have made USO voice records "to Mom." Use of the recording-machines was especially in demand when men were leaving for combat zones overseas. For security reasons they could not say that they were "shipping out," but they usually managed by innuendo to put so much appeal in a letter that no one could fail to understand their meaning. Today, men returning and unable to go home immediately — and particularly the convalescent wounded who visit USO clubs—send "live letters" of greetings to their families.

From a USO club in the South came the story of a man who made a special record for his family. His mother wrote back that when his pet dog heard the boy's voice he sent up

(Continued on Page 4)

disc-data for the Recordist

Record Industry Depends on Master Recording Discs

By E. Franck, Research Engineer

Disc recordings played a vital part in the war, spreading information, propaganda and entertainment. They were also used in training and in morale building.

Great Demand On Industry

Some recordings were considered so important that air priorities were given to overseas shipments of vinylite pressings. To meet the greatly increased demand for pressings, the industry was expanded and production multiplied many fold. (Note the article in this same issue on the recording work of the Armed Forces Radio Service.)

For the most part, the production of all these pressings depends on Master size lacquer discs for the original recording. Discs for this type service must meet many requirements in addition to good cutting and playback qualities.

Uniformity in Quality Needed

We can understand these additional requirements best by following the Master disc through the steps of processing. First, the recorded surface must be rendered conductive to electricity so it can be electroplated. This is usually done either by a silvering process or by a gold sputtering method. The silvering process consists of depositing silver from a chemical solution, and requires all the care and control of mirror manufacture. If everything is not right, such as solution strengths, purity, work-room temperature and condition of the recorded surface, the deposit may be weak or splotchy and the results very erratic. In general, the technique of silvering needs to be adjusted to the particular recording disc used. Of course, once the technique has been adjusted to give good results, the recording discs must be uniform in quality in order to give consistent results. In the sputtering process, the Master disc is subjected to worse tortures. It is placed in a vacuum chamber and positioned next to a sheet of gold. The gold sheet is made a cathode of an electrical gaseous discharge and some of the gold is "splashed" off onto the disc.

Masters Copper Plated

After being coated with silver or gold, the lacquer Master disc is plated with copper to give a strong metal plate, and then stripped away from the disc. This gives a metal plate with ridges in place of the grooves in the recording and is used to press out "pressings" or records.

Lacquer Must Be Good

If the recording lacquer of the Master disc is not good, the silver or gold may adhere too strongly to the lacquer coating and make the stripping troublesome or impossible. With a good lacquer Master disc, on the other hand, the stripping process is easy and the disc may be put either through the silvering or the gold sputtering process more than once if required.

Processing Often Delayed

Frequently, there may be a delay between the time of recording and processing. This places an additional requirement on the Master disc, that is, that the recorded grooves shall not change shape during this period and that there shall be no increase in noise level.

AFRS to Stay In '46

(Continued from Page 1)

its headquarters in Los Angeles at a pace equal to that established during war time. This means AFRS headquarters will continue to produce 151 separate radio programs weekly, the equivalent of 60 transcribed hours of entertainment. Weekly air shipments will continue to key distribution points of clusters of AFRS outlets with each shipment offering a fresh issue of 120 plastic transcriptions, 5½ hours of script material, new selections for basic music libraries, and special educational and informational programs.

In addition, AFRS will maintain its shortwave operation offices in New York City and San Francisco. One thousand five hundred hours of AFRS programs a week are now being beamed overseas from 19 powerful shortwave transmitters ranging from 20,000 to 100,000 watts in power.

New Recording Tricks Saved Day

Approximately one and one-half million AFRS transcriptions have been shipped overseas since World War II began and ended. It is the general consensus of AFRS headquarters that the enormous task of bringing radio entertainment programs of the highest technical quality and talent performance from Los Angeles to American Forces throughout the world would have been greatly impaired without the development of new transcription techniques given impetus by war time requirements.

✦

Col. Thom. H. A. Lewis, former AFRS Commandant, receives millionth plastic transcription from Joseph Cousins, Los Angeles pressing plant employe.

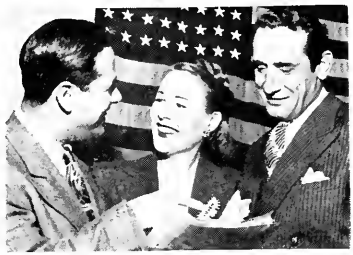
✦

The demands Armed Forces Radio Service made on the transcription industry were unprecedented. In many instances AFRS reached out into overseas theaters and brought back recording experts who had been drafted from pressing plants earlier in the war. Pressing processes were streamlined. And plant personnel worked on a 24 hour basis. In some cases pressing plants increased their transcription output thirteen hundred per cent to meet demands of the AFRS for more and more pressings!

New Year Plans Outlined

Today the transcription industry as a whole is turning out over 100,000 pressings per month for Armed Forces Radio Service. Sixty per cent of all AFRS transcriptions are shipped to overseas broadcast outlets and to ships of the U. S. fleet. Forty per cent are distributed to hospital sound systems operated by the AFRS in this country for wounded war veterans.

The outline of special AFRS shows for 1946 follows the same pattern of programs carried throughout the war. Included on the 1946 production list are its four major productions: "Command Performance," "Mail Call," "G. I. Journal," and "Jubilee." Included among other original AFRS shows slated for '46 are "Hymns From Home," "Concert Hall," "Downbeat," "G.I. Jive," and "Jill's Juke Box."



Producer-Director Robt. Lewis Shayon, Actress Wendy Barrie and Actor Victor Jory discuss "CRISIS IN OUR TOWN" script.

Nation Brought Closer to Human Problems

Work of Community Chests Aired to Public

A better understanding of human beings, their problems and the tangles they get out of, with the help of social agencies, is resulting from the widespread use of an annual series of recorded dramatizations being distributed by the non-profit organization, Community Chests and Councils, Inc.

These open-end recordings of fifteen-minute dramatizations are superbly produced and directed, and enacted by leading artists of stage, screen, radio and music.

The organization already has a third of its new series of scripts ready for 1946 production and distribution throughout the country for broadcast over leading stations.

Given Best Air Hours

With the exception of New York City, Community Chests exist in every city of more than 25,000 population, and distribution is made through the local Community Chests which are thereby made responsible for audience building and promotion. Use of open-end recordings permits complete identification of the program with the local Chest and work of the agencies it supports. During the last two years, the choice broadcasting hours allocated by local stations to these public service programs is a barometer of their excellence, and, according to a recent poll, the welcome mat is out for the new series when it comes along, thanks to the care with which scripts, production, casting and music are handled.

Rh Factor Discussed

Timely and provocative, the series each year includes some highly scientific material, such as the Rh factor, newest discovery in blood chemistry, which was dramatized in the 1945 series. The story, "MARVELOUS UNKNOWN," was written to dramatize some of the work done in hospitals supported by Community Chests. But its popularity with Dr. Alexander S. Wiener, a co-discoverer of the Rh factor, has been so great that he now uses the recording to highlight and illustrate his lectures on the subject to doctors and scientists!

Scripts are under the direction of Eloise Walton of Community Chests and Councils, Inc., and production and direction are in the capable hands of Robert Lewis Shayon, of the Columbia Broadcasting System.

Special music was written and directed by Jon Gart, and some of the talented stars enacting these stories are Victor Jory, narrator for the 1945 series, "CRISIS IN OUR TOWN," Mady Christians, Celeste Holm, and Ralph Bellamy.

Top Stars Featured In NTA Series

Hu Chain to Direct New Year Productions

A series of 13 radio dramatizations, playing up various aspects of tuberculosis control, has been produced by the National Tuberculosis Association under the title of "The Constant Invader." The transcriptions are for use by the National Association's affiliated associations throughout the country, which have ordered 270 sets.

The shows were written and directed by Hu Chain, with Dr. A. J. Cronin, well known author, as the narrator, and professional actors as the cast. Original music by Ben Ludlow was used. Another series of 13 will be produced by the Association in 1946.

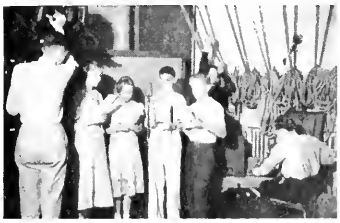
In connection with the annual Christmas Seal Sale, the Association, as usual; produced three radio transcriptions which were placed by affiliated associations on local stations throughout the country.

One was a fifteen-minute dramatic show commemorating the 50th anniversary of the discovery of the X-ray and starred Walter Huston. It was called "The Light That Saves Lives."

A musical show, also fifteen minutes and entitled "Christmas Seal — Christmas Music," featured Richard Crooks, the tenor, and Howard Barlow and his orchestra from the "Voice of Firestone" program. Milton Cross was master of ceremonies. The third was a series of spot announcements made by such persons as Roland Young, Herbert Marshall, Victor Moore, Lou Costello, Ray Milland, Capt. Eddie Rickenbacker and Edward Everett Horton. Orders were placed for 425 of each transcription in the set. Hu Chain was producer.

Most Beautiful Harpist? . . . . .

21-year-old blond Elaine Vito, harpist with the Music of Manhattan orchestra currently being heard on many stations throughout the country on transcriptions. Norman Cloutier, director of the orchestra which comprises some of America's best known musicians, is convinced that Elaine is the world's most beautiful harpist.



JJHS students broadcast round-table discussion over school sound system. (Presentation was recorded for future play-back and reference.)

World's Future Dependent On Modern Education

(Continued from Page 1)

pictures and snapshots taken by pupils to go with the recordings they make. These pictures can be shown on a screen by using an opaque projector, or made up into slide films and synchronized with the recordings. But, if this equipment is not available, then a scrapbook of recordings and snapshots is excellent. A well organized use of audio-visual aids will save from thirty-five to fifty percent of the time usually required to teach a given lesson. But more important than this is the fact that students have a wonderful opportunity for the mutual exchange of ideas, that to them are real and full of meaning.

Children Correct Voice Problems

"Recording discs, alone, serve many useful purposes. They can be integrated as a part of a round-table discussion and broadcast over the local school sound system or aired over a local radio station. For example; last year we made recordings of a series of eleven seasonal programs for our music department in eleven elementary schools, to be broadcast over two local radio stations. The children enjoyed hearing themselves before they went on the air and their teachers were given the opportunity to make necessary corrections in their style and delivery.

"With this type of procedure, children will find their citizenship training a functional, practical, and in understanding many community and national problems."

Church Women Plead For Enduring Peace

(Continued from Page 1)

Mrs. Sibley recorded her forceful message and one hundred cities across the nation bought and used the 100 recordings made.

Golden Rule Emphasized

By means of this recorded appeal thousands of homes in nearly every state in our union heard the earnest voice of Mrs. Harper Sibley, American Mother of 1945, saying:

"We must accept the Price of Enduring Peace—we who have paid so dearly in lives and blood for this war. And the price of enduring peace is based on willingness to take seriously the Golden Rule—wherever we may happen to live, hour by hour and day by day —"to do unto others as we would they should do unto us." It demands that we cast aside prejudice and old concepts of human relationships and recognize our kinship, as children of the one God, with peoples of all races, all creeds, all nationalities, everywhere on earth, but beginning in our own home town. If we want peace for ourselves, we must be prepared to share it with the other members of the world family; for peace today, like war is indivisible."

USO Recording Service

(Continued from Page 2)

great bays of delight. So the soldier went back to the USO club and made a whole recording just for his dog Fido.

Even a Will Recorded

The stories behind these recordings are endless. A composer made a record of piano music at the USO club in Hempstead, L. I., N. Y. One man once made his will, and its legality would be an interesting question. Again a tall soldier visited a Long Island USO and recited to a record a poem he had written for a shut-in invalid boy.

The system, however, works two ways. Frequently USO junior hostesses have made voice records for men who had visited the clubs and who had been transferred to other camps. And often mothers have come into the clubs to make records for their sons. Many are the instances of young wives who have held a child up to a microphone so that "daddy" far away could hear for the first time his baby's voice.

Many men welcome this method of greeting, and at holiday-time send their thoughts winging homeward on those little round discs.

Attention Readers

Audio Record is published monthly in the interest of better disc recording. If YOUR name is not on the Audio Record mailing list, drop a penny post card to — The Editor, Audio Record, 444 Madison Avenue, New York 22, N. Y.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2 No. 2 | 444 Madison Ave., N. Y. C. | February, 1946

ABS Sets Sights As Major Web

Recording "Saves Day" For Newscaster

A streamlined, major market network reaching twenty-five of the country's leading distributing centers thumbnails the framework of the Associated Broadcasting System, the nation's newest radio chain

John B. Hughes

Off To Good Start

ABS, boasting a metropolitan coverage of forty million potential customers, launched its sixteen-hour daily, coast to coast schedule last September. In the web's inaugural ceremonies, FCC Chairman Paul Porter, principal speaker, hailed the birth of Associated as a "symbol of the American determination to face the post-war period, not timidly, but with the courage to push on to new goals of achievement."

Net's Family Grows

With nineteen affiliates and four stations who cooperate in the clearance of time, ABS offers its listeners a variety of programs. It takes particular pride in the number of outstanding news programs currently being aired.

Travel Limitations Ignored

The importance of instantaneous recordings in the new network's makeup is told in a report received from Mr. Tom Dunn, ABS Publicity Director. "Recently," Mr. Dunn relates, "John B. Hughes, one of our chain's leading newscasters, went on a lecture tour. Due to uncertain travel conditions which might have prevented him from reaching a network station, his program was transcribed and shipped to the nearest originating affiliate for a playback. This arrangement, I'm happy to say, proved highly successful."

Leonard Versluis, himself owner of a Grand Rapids, Mich., radio station, WLAV, and for many years identified with the phonograph business in Michigan, is president of ABS.

Student director, engineer and turntable operator learn their duties at WNYE studios in Brooklyn Technical High School.

WNYE Trains N. Y. High School Engineers, Recordists

Radio Courses Offered by Board of Education

New York City high school students are currently being given intensive training in all phases of radio production at the Board of Education FM Station WNYE, located in the Brooklyn Technical High School building.

Tele Instruction Also Given

In conjunction with helping to operate FM Station and producing 20 broadcasts a week for classroom listening, students study theory of radio, broadcast station operation, sound recording, script writing, radio acting and production. They even study the rudiments of television production by appearing at CBS Station WCBW on "There Ought To Be a Law."

Many Get First Class Licenses

While the courses in script writing, radio acting, and radio production are open to students from all of New York's eighty high schools, engineering courses are open only to boys from Brooklyn Technical High School because of the very intensive and thorough pre-requisite training which is required for admission to these advanced classes. The

(Continued on Page 4)

WOR and AUDIODISCS "On the Ball"

Only ten minutes after the conclusion of ex-Prime Minister Churchill's press interview with reporters and newsreel men upon his arrival a few weeks ago on the Queen Elizabeth, WOR (New York's Mutual Outlet) was on the air with a 15-minute transcribed broadcast of the occasion.

Dave Driscoll, News and Special Features director, during the 30 minute press interview, repeated reporters' questions into a portable mike and Churchill's replies were recorded. Simultaneously, the entire proceedings were being recorded on Audiodiscs at the WOR studios and then edited for broadcast.

Raymond Massey and Canada Lee during a recording of "Two Men On a Raft."

Recorded Skits Popular "Y" Feature

Pressings Gain Favor Over "Live" Shows

The Young Men's Christian Association, largest user of electrical transcriptions in the field of Youth-serving agencies, also was first to utilize them on large scale.

Only Quality Programs Given

According to Henriette K. Harrison, National Radio Director for the Y. M C. A., a number of 'Y's' have weekly live programs, but the majority of them prefer the transcriptions because of a large acceptance by radio stations who by now are accustomed to the high standard of recording, performance and writing set by the organization. Approximately 359 'Y's' now feature recorded radio programs, locally.

Casts and Writers "Tops"

The best writers are used at all times as well as the finest professional actors and musicians available. Such personalities as Raymond Massey, Frederick March, Canada Lee, Paul Robson, Constance Collier and Edmund Gwenn have appeared in dramatic roles.

Recordings Aid Public Forums

Miss Harrison also states that while 'Y' recorded programs always interpret the aims of the organization, it is recognized that entertainment is a prime requisite. Many of these recorded programs are used on playbacks and made the basis for discussion and forums in Y.M.C.A.'s having Public Affairs programs.

Miss Harrison says further that the Y.M.C.A. is now planning a new series of thirteen transcriptions for early release.

"Der Bingle" Disc Booster

Recorded Shows Would Permit "Time Off"

The recent court action of the Kraft Food Co. against Bing Crosby for his failure to appear on the Kraft Music Hall radio program was highlighted by the crooner's statement that he preferred to do future programs by means of transcription, making three or four in advance so that he "can get away a little bit."

AFRS' Record Sighted

Bing contended that the Armed Forces Radio Service with its thousands of transcribed programs, more than proved that discs are the coming thing, chiefly because with them it is possible to edit, change or revise a program before it hits the air.

KFAB Farm Service Editor Bill MacDonald in Chicago's Stevens Hotel "Studio."

Audiodiscs Aid KFAB Scoop Neb.-Iowa Press

Highlights of 4-H Club Congress Recorded

Audiodiscs brought the top stories and "voices in the news" back to the midwest listeners of KFAB (Omaha-Lincoln) when Farm Service Editor, Bill MacDonald, covered the recent National 4-H Club Congress in Chicago.

Winners in the various classes and the delegates were interviewed in the "studio" set up in the Stevens Hotel, center of activities for the 4-H Club Congress.

"First"

All stories covered at the Congress were put on Audiodiscs and expressed to the Lincoln studios for "airing" each morning on the regular farm hour and play backs during the day. Thus, with Audiodiscs and air express, KFAB beat the daily presses in Nebraska-Iowa rural area by several hours.

disc-data for the Recordist

Tests Used in Recording Lacquer Research

By E. Franck, Research Engineer

A good recording lacquer is one that has been developed expressly for that purpose and none other. Experimental development work on this product includes a continuous process of testing each production run and, more important, a thorough study of other types of materials. This work requires careful tests of many different factors.

Some requirements are quite obvious. A smooth mirror-like surface, strong color and lack of unpleasant odor are basic essentials. There must also be good permanent adherence to the flat base material—usually aluminum or glass.

Cutting qualities are next tested. The coating material should offer low resistance to the cutting action of the stylus. At the same time, the material must be tough enough to reproduce the full range of audible sound frequencies throughout many playings. As the grooves are cut, there must also be a consistent, positive thread throw and the thread must be free from any annoying static charge. The grooves cut must be shiny and the material should not cause undue wear of the stylus.

Playback tests are next in order. Good tracking, low noise level (background scratch) and high frequency response, after many playings, should be evident. While tests for noise level and high frequency response can be made, to some extent, simply by listening, adequate results can only be obtained by precise measuring equipment.

Another major item to be considered is that the lacquer should "behave well" when processed for making pressings—either by the silver deposit or gold sputtering method.

For some applications of recording discs, one of the slowest tests is of major importance. That is the aging behavior of the grooves with regard to noise level and distortion. No "shortcuts" can be employed here. Careful, methodical, routine testing over a long period of time is required to see that initial noise level and distortion do not climb with age.

Other factors are also considered such as behavior with an advance ball, true groove contours and grease resistance.

Finally a good recording lacquer must stand up under varying degrees of temperature and humidity. The importance of such qualities was particularly emphasized during the war when discs were subjected to sub-zero shipping conditions and were used in the heat and humidity of tropical areas.

Rickenbacker Records "Air History" Series

Famed Aviator Contributes Salary to AAF Aid Society

A significant new trend toward transcribed radio presentations featuring outstanding name personalities is seen in the new Longines' "World's Most Honored Flights" series with Capt. Eddie Rickenbacker as host and commentator.

Eddie Rickenbacker

The business commitments against Capt. Rickenbacker's time were such that it would be impossible for him to appear on a live show at a certain hour on a certain day every week for several months. He could however adjust himself to the more flexible schedule of dramatized recordings.

America's Number One Voice of Aviation will be heard weekly starting February 2nd on a series of 13 coast-to-coast half-hour programs. The plays are rich in brand new dramatic personal-history material about American air pioneers.

AAF Needy To Benefit

The sponsor, at the request of Captain Rickenbacker, pays the fees he would ordinarily get to the AAF Aid Society to swell the fund for needy AAF widows and orphans as well as AAF men and women disabled in line of duty.

All recordings for the new series were made by the Columbia Recording Corp

Martin Block's "Record Shop" Gains Large Audience

Martin Block, creator of Radio's famous "Make Believe Ballroom" is hitting the air "jack pot" again with his new CBS transcribed program, "Martin Block's Record Shop."

Block interviews the artists whose recordings he plays on the program, and each week gives back-stage information about the leading figures in the world of popular music.

Recordings for Insomnia Victims

Recordings for helping people who cannot sleep or who are under a nervous strain were aired in New York recently on WNEW's "Music Hall" program. The recordings were from hypnotist Ralph Slater's new DeLuxe Album.

A group of Wing Scouts visit a recording studio.

Glossary of Disc-Recording Terms

(Editor's Note—We wish to thank the publishers of "The Proceedings of the I. R. E." for their cooperation in allowing us to re-print "Glossary of Disc-Recording Terms" (prepared by Recording and Reproducing Standards Committee of the National Association of Broadcasters) in this, and subsequent issues of Audio Record.)

Abrasive: The grinding material sometimes incorporated in record stock for the purpose of shaping the needle point to fit the groove properly.

Acetate disc: Various acetate compounds used for solid and laminated (which see) discs. The term is often erroneously used to describe cellulose-nitrate discs (which see).

Advance ball: A rounded support (often sapphire) attached to the recording head which rides on the discs to maintain a uniform mean depth of cut by correcting for small variations in the plane of the disc surface.

Angle of Groove: The angle from wall to wall of an unmodulated groove in a radial plane perpendicular to the surface of the disc.

Backed stampers: A thin, metal matrix (which see) which is attached to a backing material, generally a metal sheet 1/8 inch to 1/4 inch thick.

Binder: A resinous material which causes the various materials of a record compound to adhere to one another.

Biscuit: A small slab of the stock material, from which records are pressed, as it is prepared for use in the presses.

Blank groove: A groove upon which no modulation is inscribed.

Burnishing surface (of cutting stylus): The portion of the cutting stylus di-

(Continued on Page 4)

Girl Scouts Map '46 Recording Plans

New Series To Be Cut Soon

The Girl Scout national organization, which has used radio-recordings successfully in the past, has two other transcription series on the books for 1946, according to Mrs. Inez Kimball, radio director. Cutting on both series will start at an early date.

Radio and Screen Represented

One series — "The Girl Scouts Present" — will consist of six 3½-minute "acts" by name stars of radio and screen, three on each side of a 16-inch disc. Each act will be strictly "entertaining," and will not be merely an appeal for support of Girl Scouting by the artists.

All Troops To Receive Pressings

Vinylite pressings will be used and the records distributed to local Girl Scout councils throughout the country. The series is designed to give local radio chairmen a better approach to their radio stations, and to help improve local Girl Scout radio shows.

Spots Flexible

Each one of the 3½-minute spots can be used in many different ways—either in a five-minute spot, with the local announcer giving the opening and closing, with an advance build-up of the star being presented, or as a part of a 15-minute program, featuring local Girl Scout activities.

The other series will consist of a set of four ten-minute recordings, produced especially for educational radio stations. These four will feature Girl Scout national leaders and Girl Scout promotional material.

(Continued on Page 4)

Glossary of Disc Recording Terms

(Continued from Page 3)

rectly behind the cutting edge which smoothes the groove.

Burnishing tool: The stylus sometimes used to smooth the groove of a recording.

Cake Wax: A thick disc of wax (which see) upon which an original recording is inscribed.

Capacitor pickup: A phonograph pickup which depends for its operation upon the variation of its capacitance.

Carbon-contact pickup: A phonograph pickup which depends for its operation upon the variation in the resistance of carbon contacts.

Cellulose-nitrate Discs: See Lacquer discs.

Center hold: The hole in the center of the record, which fits the center pin of the turntable.

Center pin: The shaft protruding from the center of the turntable used for centering the record.

Chip: The material removed from the disc by the recording stylus in cutting the groove.

Christmas-tree pattern: A term sometimes used in referring to the optical pattern (which see).

Condenser Pickup: See Capacitor pickup.

(Glossary of Disc-Recording Terms will be continued in the March issue of Audio Record.)

WNYE Trains Engineers, Recordists

(Continued from Page 1)

boys take the FCC License for Radio Telephone Operator, First Class, at the conclusion of the term's work, and so far an average of 90% of them qualify. All of them secure the Second Class License with apparent ease.

Only Professional Work Accepted

Students in the class in sound recording are trained to record every program as it goes on the air, and these professional recordings are used for re-broadcasts at a later date. The boys use a Scully Recorder with an RCA cutting-head and Audiodiscs. Their work must be of professional quality since it is to be used in actual broadcast. In addition the recordings serve a valuable purpose in the analysis of their own work by student actors and writers, as well as in providing models for study by elementary classes in radio techniques.

Equipment Maintenance Emphasized

The recording laboratory is conducted by Mr. Lester Levy, of the Brooklyn Technical High School faculty and the WNYE staff, who insists upon holding the boys to the highest possible level of performance. Mr. Levy stresses that they must not necessarily be able to operate the equipment but must be able to maintain and repair it, conduct tests, understand the theory and possibly conduct the measurements of the apparatus.

Recording Instruction Necessary

J. F. Macandrew, Radio Coordinator for the Board of Education, states that recording is an indispensable part of the operation of an educational radio station.

Girl Scouts Map '46 Recording Plans

(Continued from Page 3)

Radio Education Stressed

The Girl Scouts also recorded a Girl Scout NBC program featuring Helen Hayes, "Continued Story," and made the records available for local Girl Scout councils. Radio activities are stressed in all Girl Scout age levels—from the 7-year-old Brownies to the 18-year-old Seniors.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2 No. 4 | 444 Madison Ave., N. Y. C. | April, 1946

Technical Men Meet at Frank L. Capps & Co.

Isabel Capps, Speaker

Frank L. Capps & Co., Inc., 244 W. 49th St., New York City, recently played host to a distinguished group of engineers in the first of what will probably become a series of meetings to consider the lacquer cutting stylus in relation to groove shape and to playback fit.

Miss Isabel Capps had arranged an interesting exhibit to demonstrate the incredibly small portion of the sapphire actually employed in cutting a record and the effect upon the groove of different treatment in the manufacture of the stylus.

Sapphire Portion Made of Lucite

The first exhibit consisted of 25 to 1 scale models which were passed among the audience. These models really looked like the familiar lacquer stylus, since the sapphire portion was made of lucite inserted into an aluminum shank. The effect upon the audience was nothing short of sensational because they revealed with such a dramatic highlight the actual proportion of cutting area to the whole stylus. On each model the effective portion of stylus used in cutting 100 lines to the inch at a 60/40 ratio had been inked over. The included angles continued above this inked out area for inches while the shank itself was over a foot long. The usual assumption in examining a stylus under a 20X glass is that practically all of the angle thus magnified is involved in the cut. These models very effectively demonstrated how small the tip portion of the sapphire is that must be controlled in manufacture.

Image Enlarged Many Times

Miss Capps went on then to show cross sections of grooves cut with styli of varied specification. These were shown in shadowgraphs which enlarged the image 500 times. With the aid of scale charts she demonstrated how very small the actual difference of 5 degrees makes in the resultant groove and that because of the microscopic amount of the sapphire actually used in cutting, the slightest deviation in shape immediately above the radius gives a false picture of the true included angle unless the cut is deep.

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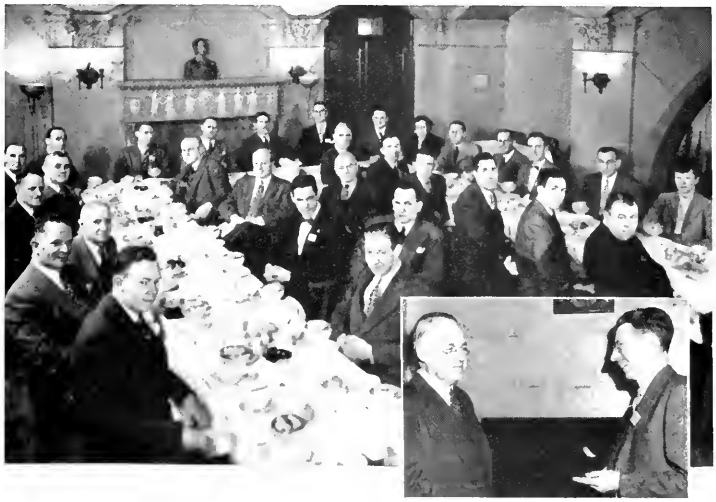


Audio Device's Press Luncheon held last month at New York's Hotel Lexington. INSET—Dr. O. H. Caldwell, Editor, Electronics Industries and Mr. Wm. C. Speed, Audio President (luncheon's principal speaker) discuss recording's history.

Audio Devices' President Sees Recording Boom; Education—Entertainment—Business to Benefit

Recently, speaking at a press luncheon in the Florentine Room of New York's Hotel Lexington, Mr. William C. Speed, President of Audio Devices, Inc., predicted a great expansion period for disc recording in the entertainment and educational fields.

Speaking of the educational possibilities of recording, Mr. Speed said, "Less than 1% of all primary and secondary educational institutions have recording equipment, yet trends point to recorded educational features in which the student participates as a prime factor in child and adult education. In addition, there is promise of immense increase in the use of recordings in our national school system. Thirty-two states are now laying plans for state-wide educational radio networks in which recording will play an important part.

"Dramatized education is still in its infancy. Through the use of sound and motion films, together with records and transcriptions somewhat along the lines followed in recorded speech instruction courses, we shall be able to accelerate greatly the education of our children and add vastly to their store of knowledge."

(Continued on Page 2)

Multi-Cellular Speaker Introduced

Sound Reproduction Methods Revolutionized

The audio recording and reproducing system like a chain "is no stronger than it's weakest link." The fidelity of the sound at the output, can be limited by any one of the components in the system. Thus, if a major improvement is made in the cutter head or recording blank performance, this improvement can not be delivered to the ear unless every unit in the series recording or reproducing system is like-capable. Many of the handicaps limiting the fidelity of sound reproduction result from the six primarily mechanical devices in the re-

(Continued on Page 3)

Iowa State College radio students "on the air" in Workshop Studios of WOI—Ames, Iowa.

Iowa State College Radio Trainees Record For Local Station—Gain Professional Experience

Student training in radio at Iowa State College, Ames, Iowa, is carried out through course work and workshop activities. The courses, set up in the English and Speech Department and the Department of Technical Journalism and Vocational Education, call for the use of numerous recordings.

The Radio Workshop, headed by Ed Wegener, Production Manager of WOI—Ames, has produced many outstanding transcribed shows.

Kids Loved Them

During the winter and spring of the 1944-45 school year, it presented a new series of children's programs. Beginning with eighteen episodes of "Tom Sawyer" the series was followed by twenty-one episodes of "Alice in Wonderland." These two popular programs were presented three times a week but the response from Iowa children was so enwith eighteen episodes of "Tom Sawyer" series ended the program director of WOI, Dick Hull, requested that the next series "The Wizard of Oz" be presented five days a week for forty-seven episodes. In the presentation of these stories the Iowa State WOI Workshop used only tried and proven radio dramatic techniques. All means of holding an old audience and bringing in a new were used. For example, "The Wizard of Oz" brought in seven hundred requests (without a box top in the lot) for maps of the wonderful land of Oz.

Two-Fold Purpose

As a result of these programs, WOI increased its public service to the people of Iowa and the Iowa State students

(Continued on Page 4)

Recording Boom Predicted

(Continued from Page 1)

In discussing the status of present-day recording methods, Mr. Speed, who presented historical high-lights of various stages of progress in recording history from 1890 to the present, demonstrated that disc recording has now reached a state of perfection undreamed of when Thomas A. Edison recorded his own voice in a recitation of "Mary Had a Little Lamb." "Because of the fact that the disc method now permits recording and reproduction of almost the complete tonal range audible to the human ear," Mr. Speed continued, "it now surpasses any other form of recording.

Wire Lacks Fidelity of Disc

"The millions of phonographs now in America's homes," he added, "will never be made obsolete by wire or tape recording. Wire and tape recording lack the tonal fidelity and dynamic range necessary for accurate recording and reproduction of musical selections.

"Undoubtedly," Mr. Speed concluded, "each form of recording will find its own place in radio, educational, business and social fields."

disc-data for the Recordist

By E. Franck, Research Engineer

Improvement In Lacquer Cutting Styli

At a gathering of Recording Engineers on March 7th, reported on page 1 of this issue, Miss Isabelle Capps outlined the results of research she has been doing concerning lacquer cutting styli.

Her study of the actual shape of grooves cut by styli of different forms will result in a distinct technical improvement in lacquer recording throughout the industry.

Better Top Corners

One of the types of groove distortion Miss Capps described, particularly interesting to us from a lacquer viewpoint, concerned the top corners. She found that the burnishing surface must be very small at a point corresponding to the top of the groove, if clean corners are desired, and has been able to get top corners that are almost perfectly clean through control of the burnishing surface. As far as actual groove shapes are concerned, this corner distortion probably accounts for most of the difference between wax and lacquer grooves.

Lacquer Formulation Also A Factor

In our own lacquer development work, we have been conscious of this corner effect and have found that lacquers themselves can vary in the amount of distortion produced even when cut with the identical stylus. In general, the effect is greater with a softer lacquer than a hard one, although the controlling factors seem to be more than mere hardness. No doubt, there is a tendency toward instantaneous cold flow, which is greater or less, depending on the particular lacquer formulation. We have always believed that a lacquer which has cold flow and produces this type of deformation is apt to flow back slowly after the grooves are cut, thereby giving rise to an ageing distortion. We find it heartening that this particular trouble can be attacked and progress made from two different directions — stylus shape and lacquer formulation.

Mutli-Cellular Speaker Introduced

(Continued from Page 1)

cording and reproducing system, namely the recording disc, cutter head, stylus, pick-up, turntable, and loudspeaker. Engineering development are constantly overcoming these mechanical bottlenecks.

The Duplex loudspeaker recently brought out by Altec Lansing Corporation, 250 W. 57th St., New York City, removes the bottleneck from this particular mechanical device. Faithful conversion of electrical to acoustic power is obtained with the Duplex because it is a two-way loudspeaker incorporating a separate lightweight aluminum diaphragm for reproduction of the frequencies above 2000 cycles and a separate 15" molded cone diaphragm for reproducing those below 2000 cycles. Also incorporated in this loudspeaker, is a multi-cellular horn which spreads the sound from the high frequency portion of the speaker providing uniform quality distribution over a horizontal angle of 60 and a verticle angle of 40°.

Altec Lansing's Multi-Cellular Two-Way Speaker.

No Cone Type Limitations

The design of the Duplex Loudspeaker overcomes the several serious limitations which conventional single unit cone type loudspeakers have as follows:

(a) Inefficient reproduction of high frequencies which require the use of small diaphragms of extremely small mass.

(b) The speed of propagation of sound in ordinary paper cone does not permit efficient radiation of high frequencies.

(c) Non-uniform radiation of energy due to the fact that the angle of distribution decreases as the frequency increases which limits the size of the diaphragm.

(d) Distortion due to intermodulation of low and high frequencies always present in single diaphragm type of speakers.

More Ampere Turns In Gap

The use of edgewise wound ribbon in the voice coils of both the low and high frequency diaphragms in the Duplex loudspeaker provides 27% more ampere turns in the gap, which almost alone accounts for 22% increase in acoustic efficiency. The compliance of the high frequency daphragm is provided by a tangential corrugation which allows three times the excursion for the same stress as is allowed by the ordinary annular corrugation. The new Alnico No. 5 permanent magnets used in both the low and high frequency units is also a very important factor in the increased efficiency of this speaker.

Recording Industry Enthusiastic

The Duplex loudspeaker which represents Altec Lansing's offering in the non-theatrical field has been received with enthusiasm by the radio and recording industry. As mounted in several models of ported cabinets it is rated to give uniform reproduction thruout the entire F. M. range of 50 to 15,000 cycles. While this high frequency response is far above the best of present disc recordings, it is an engineering fact that a sound reproducing system should be capable of reproducing up to an octave higher than that which it is actually called upon to do.

In the recording field the Duplex loudspeaker is ideally adaptable for monitoring and for detecting high frequency distortion and intermodulation which may develop in the recording system. It is also offered for use in client's and audition rooms where it is imperative that the best presentation be made.

In spite of the admitted flexibility of the wire recorder for "on the spot" recording, it is significant to note that Omaha's KFAB relies on their portable disc recorder for all such occasions. Pictured above, KFAB's Lincoln Supervisor, "Wink" Wight is seated in the station's Mobil Unit which houses a battery operated self-contained independent power plant. A real of make cable is so constructed with commutator that it enables cable to be reeled out or in while recording. The Mobil Unit is augmented with broadcast relay equipment mounted in two wheeled trailer which can be attached for direct broadcasts.

I. U. Public Speaking Classes Graduate Outstanding Orators

Recording Routine Proven Success

Indiana University is another one of the many mid-western schools who depend heavily on recording in their department of speech.

In the public speaking classes at the Hoosier school, each student is required to make a recording of his voice delivery at the beginning of the semester. This disc is analyzed by both the student and the instructor, for the purpose of determining defects which should be corrected during the progress of the course. Near the end of the semester, the student again makes a recording to gauge the degree of his improvement.

Such a recording routine has proven very successful at Indiana and has given the school many outstanding orators.

Quaker City Station Records Interviews With Phils, A's

From the Florida baseball training camps of the Philadelphia Phillies and Athletics, WFIL—Philadelphia is bringing its listeners recorded interviews with players, managers and coaches of the two big league clubs.

These transcribed interviews are rushed from the Southland for rebroadcast on Tom Moorehead's WFIL's sport show at 6:30 P. M. daily.

Major Martin H. Work and Mr. V. T. Rupp.

Ninety Thousandth Audiodisc Presented to AFRS Commandant

Last month in Los Angeles, Mr. V. T. Rupp, Audio Devices' Southern California representative, presented the 90,000th Audiodisc produced for the Armed Forces Radio Service, to Major Martin H. Works, AFRS Commandant.

Although hostilities ceased eight months ago and millions of victorious servicemen have returned to civilian pursuits, the Armed Forces Radio Service continues to present some 800 radio programs monthly to troops still overseas.

AFRS uses Audiodiscs 24 hours a day in transcribing continuously the top programs off the four major networks in this country. Fast Air Transport Command planes carry these recordings to GI radio outlets overseas.

Of the 90,000 Audiodiscs supplied since the start of the war, over one third have been Master discs used in the production of a large part of the more than 1,500,000 vinylite pressings made and distributed by the AFRS.

Technical Men Meet

(Continued from Page 1)

All the record strips used to reveal these fractional effects were cut with master styli personally developed by Miss Capps and on which the included angle and burnishing facet were controlled. She demonstrated in connection with the controlling of the burnishing facet that this facet must be very small at a point corresponding to the top of the groove if clean corners are to be obtained.

She also showed record strips cut with regular styli to show the normal error in shape that must be present in styli made on a mass production basis.

Finally, Miss Capps pointed out that if the portion of the Sapphire involved in cutting is incredibly small, the portion of the playback sapphire reproducing the cut is even smaller since it is expected in most cases not to ride the bottom but the side walls of the groove.

Orange Bowl Recordings Given to Miami U. Prexy

Handsomely bound in a leather album, a complete set of recordings of the 1946 Miami-Holy Cross Orange Bowl football game, broadcast last New Years Day by Ted Husing over CBS through WQAM Miami has been presented by the Gator Station to Dr. Bowman Ash, President of Miami Universiay.

Highlights from the two-hour and 45 minute album will be featured once a year hereafter at Miami's Midnight Victory Pep Rally held on the campus the eve of the "Hurricanes" most important game.

College Radio Trainees Record

(Continued from Page 2)

who worked on the programs (all of the work except direction was done by students) learned more about radio than they would in many classes or from innumerable lectures.

Iowa State College is but one of the many schools, boasting outstanding radio courses, who believes that there is no better teaching device in speech than the recording which allows one to hear their own voice as it sounds to others.

Glossary of Disc Recording Terms Will Be Continued in the May Issue of Audio Record.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2 No. 5 | 444 Madison Ave., N. Y. C. | May, 1946

Report: Audiodiscs Excell At Colo. Speech Conference

Wabash College Recording Methods Outlined by Speech Professor

Recently, at the Rocky Mountain Speech Conference in Denver, Colorado, Dr. W. Norwood Brigance, Professor of Speech at Wabash College, Crawfordsville, Indiana, had an occasion to make several recordings on different types of recording discs.

Just how well Audiodiscs fared in competition with other discs is told in a letter received from Dr. Brigance. He writes in part: "I must confess, my opinions were again confirmed. Audio recording discs are the best made."

In his letter, Dr. Brigance further explained his school's particular application of Audiodiscs: "Sometimes we have our students give a radio speech from the broadcasting studio and we make a recording in the classroom while they are talking. At other times we have the student speaking in the classroom with a microphone five or six feet away, so the audience situation is such that the microphone is not the dominant feature. Then from the recording room, one section of the student's speech is recorded. Thus, we catch a section of the speech while the student is actually in action in front of a live audience to enable him to hear himself as he sounds to other people.

"This same procedure is followed in panel discussions, where the panel members are seated around a table in the studio "broadcasting" their panel discussion to the classroom. In the classroom we record either all or part of this discussion so that students taking part in the panel may, at their leisure, hear themselves as others heard them.

"Finally, in group or individual drills, where a student has a speech inadequacy, I will let him read a passage, I will read it, then he will read it again, and, once more, I will read it. This technique permits the student to hear both recordings, his own and the instructors', and develop an ear for noting the difference in speech standards.

"Our methods here at Wabash College," Dr. Brigance continues, "have been thoroughly tested and our success in using them lies largely in efficiency of application."

Major Robert Vincent, chief sound engineer at United Nations meeting, seated at control panel. Inset—A section view of the U. N. O. recording room, Hunter College, Bronx, New York.

"Twenty-Five Hundred Recording Discs Will Be Used Before U. N. Sessions Close"—Vincent

The man with the responsibility of seeing that the proceedings of the United Nations Security Council, now in session at Hunter College in the Bronx—New York, are relayed to the outside world is Major Robert Vincent, chief of U. N.'s recording section.

Major Vincent, temporarily detached from the Army Signal Corps for the purpose of wiring U. N. O. for sound, admits the present installation is more complex than the sound equipment he used at the San Francisco Conference, but far simpler to assemble and employ.

Eleven Miles of Wire

The system, comprising in part an intricate network of eleven miles of wire and 15,000 solder connections, makes possible the simultaneous feeding of programs from the Security Council Chamber to forty-eight radio, recording and other outlets, and the distribution to these points of sound from any one or all of the twenty-four microphones.

Seventeen of these "mikes" are on the Council table and four are at the interpreters' table, with three in reserve. Voices picked up by the microphones

(Continued on Page 4)

Vet Uses Recordings In Novel Promotional Stunt

Advertiser Tells 'Em He's Back

In Washington, D. C., a few weeks ago, some 500 top business executives received through the mail, at their homes and offices, an innocent looking package bearing the legend, "A record that speaks for itself!" Inside, they found a 6½-inch recording with nothing to identify the sender or to give an inkling of its message save a phone number, and the initials I. T. C. Their curiosity piqued by the oddity of the situation, many of the business men who received the package at their office went to the nearest radio or music store and played the record. Those who received them at home sat down at their own fireside with their families and listened.

(Continued on Page 3)

Speaking for the first time on the same radio program are these five top commissioners of The Salvation Army in the U. S. (left to right)—Donald McMillan, Ernest I. Pugmire, William C. Arnold, John J. Allan and William H. Barrett. The broadcast was recorded.

Recording To Play Major Role In Publicizing Salvation Army's Program of Aid To Mankind

Radio recordings by more than 30 of the nation's leading stars of stage, screen, radio, music, and the literary world will play a major part in publicizing the Salvation Army's expanded program of aid to mankind, "Marching Forward to a Better World," the organization recently disclosed to Audio Record. Most of the recordings also are produced on phonograph records as well as for radio.

Big Name Stars Record

The recordings will be in lengths from 15 minutes down to one-minute spots. Among the more unusual uses will be two and three minute recordings designed to be used by radio stations as supplements to local talks by Salvation Army or community leaders. The list of celebrities includes among others: Jack Benny, Edgar Bergen, Bob Burns, Burns and Allen, Eddie Cantor, Jane Cowl, Bing Crosby, Clifton Fadiman, Cary Grant, Fannie Hurst, Kay Kyser, Frances Langford, Raymond Massey, Fibber McGee and Molly, and John Charles Thomas.

The Salvation Army also is planning to have prominent individuals from the business world and the Army and Navy to help tell the story of its program through 1946 and into 1947.

Vet Aid Stressed

Fifteen-minute recordings have been made on the West Coast dramatizing specific objectives of the organization's program, such as aid for veterans and the extension of its work into smaller communities. This work is done by setting up committees or prominent individuals in such communities.

In addition to these recordings for the Marching forward program, The Salvation Army in conjunction with the USO, of which it is a member, has prepared four 15-minute recordings dramatizing its work for service men and women during the war and at the present time.

One of the most unusual features of its extensive work was the transcribing of a discussion on current problems facing America which was given by the five Salvation Army leaders in the United States over the Mutual Network on January 31st.

Recordings Available on Request

These recordings may be obtained upon request from Salvation Army officers in more than 1,000 cities and towns throughout the United States.

The WOR recording studios in New York handled the recording work in the East and the supplying of platters to Salvation Army people throughout the nation who do the placing with radio stations, service clubs, schools and colleges, and community groups in their areas.

Our Apologies

The Glossary of Disc-Recording Terms, originally published in the November issue of the "Proceedings of the I. R. E.", appears in Audio Record with the permission of the Institute of Radio Engineers, a fact which, by oversight, was omitted in our March issue.

Glossary of Disc-Recording Terms

Reprinted by permission of the Institute of Radio Engineers

(Continued from Page 4 of the March issue of Audio Record)

Dynamic pickup: A phonograph pickup in which the electrical output results from the motion of a conductor in a magnetic field.

Eccentric circle: A blank, locked groove (which see) whose center is other than that of the record (generally used in connection with mechanical control of phonographs).

Eccentricity: The eccentricity of the recording spiral with respect to the record center hole.

Fast spiral: A blank, spiral groove having a pitch that is much greater than that of the recorded grooves.

Feedback cutter: A cutter provided with a feedback circuit (separate from the driving circuit) in which a voltage, for inverse feedback to the driving amplifier, is induced by the movement of the cutting stylus.

Filler: The bulk material of a record compound as distinguished from the binder (which see).

Flowed-wax platter: Disk base (usually metal) upon which wax is flowed.

Flutter: Frequency modulation caused by spurious variations in groove velocity.

(Continued on Page 3)

Mr. Disc-Jockey

One of radio's most original and energetic personalities in the Disc-Jockey hemisphere is Robert Q. Lewis, popular platter-chatter announcer of WHN—New York. As his schedule will attest, Lewis is just about the busiest man in radio. From 5:00 to 6:00 P. M., Monday through Saturday and from 9:00 to 10:00 P. M., Monday through Friday, his recorded programs, featuring a wide selection of musical recordings are heard by WHN listeners. And, unlike most other artists, the Sabbath does not mean a day of rest to Lewis for he is back again on the airways with his 2:00 to 4:00 P. M. Sunday Disc-Digest.

Electronic Equipment and Parts Show In Chicago This Month

Large Attendance Forecast

The 1946 Radio Parts and Electronic Equipment Conference and Show will be held May 13 through May 16 at the Stevens Hotel in Chicago.

The first day of the Conference will feature committee and organization meetings and a special keynote dinner in the Grand Ballroom. There are no meetings scheduled for the remaining three show days and the Exhibition Hall will be open from 10 A. M. to 6 P. M. each day.

An unusually large attendance is certain as this is the first post-war get-together of manufacturers and distributors. No displays were permitted during the war years.

Audio Devices will display it's products in Booth Ninety-six.

Vet Uses Recordings

(Continued from Page 1)

What they heard was the voice of Russ Hodges, nationally known sportscaster, announcing what was probably the first spoken commercial ever written by an advertising agency about itself.

Veteran

Only two months out of the Army, I. T. C., who only a year ago had been fighting with the 87th Infantry Division in the Belgian Bulge, laid his plans perfectly, told them only to the few actually involved in production of the recording. When the bombshell struck, virtually every business man in Washington knew that the I. T. Cohen Advertising Agency, after an army-enforced absence from the field for 3½ years, was in business.

Some People Will Forget

Thus did I. T. Cohen, almost forgotten by the business firm he had served for some ten years before the war, answer for himself the question of many returning servicemen: How can I reestablish myself in business after my competitors have virtually monopolized the scene through the war years?

And so today, every business firm in Washington that uses radio or newspaper advertising knows the story of I. T. C. It is a story that Washington advertising circles will remember for a long time to come.

Attention Readers

Audio Record is published monthly in the interest of better disc recording. If YOUR name is not on the Audio Record mailing list, drop a penny post card to — The Editor, Audio Record, 444 Madison Avenue, New York 22, N. Y.

John Bubbers, engineering supervisor of Radio Station WOV—New York, examines yellow label Audiodisc in control room of Replica Transcriptions. Inset—Bubbers and Ted Rossi (seated) owner of Replica hear playback of recent program in the studio they themselves built.

Small—Hand Made Recording Studio a Success; Many Shortages—Other Headaches Overcome

Building a recording studio in these days of material shortages is a mean assignment. At least, John Bubbers, engineering supervisor of Radio Station WOV—New York and designer of the new Replica Transcription Studios, 29 West 57th St., New York City, found it so.

Last June, Mr. Bubbers and Ted Rossi, young energetic owner of Replica, decided to wait no longer and immediately set out to find equipment and office space for their proposed studio. This was only the beginning of a venture that promptly provided the two recording enthusiasts with many headaches and sleepless nights.

Equipment Hard To Find

First, they surveyed the recording field, in the hope of finding usable equipment. After a lengthy search, two used recording tables were found. They were quickly reconditioned and readied for operation. Their cutting heads had to be entirely rebuilt. New or used commercial amplifiers were not to be had at any price, so, without alternative, Messrs. Bubbers and Rossi proceeded to build their own. All other studio essentials were likewise procured from used stock sources or made by hand from spare parts. When new commercial units are again available, they will, of course, replace these home built equivalents.

There Was Always Something

Centrally located office space was finally found in October, but the two enterprising recordists' troubles were just

(Continued on Page 4)

Glossary of Disc-Recording Terms

(Continued from Page 2)

Frequency record: A record upon which have been recorded various frequencies throughout the desired frequency spectrum.

Groove: The track cut in the record by the stylus.

Groove contour: The shape of the groove in a radial plane perpendicular to the surface of the record.

Groove speed: See groove velocity.

Groove velocity: The linear velocity of the groove with respect to the stylus.

Grouping: Nonuniform spacing between grooves.

Guard circle: An inner concentric groove inscribed on a record to prevent reproducer from being damaged by being thrown to the center of the record.

Hill-and-dale recording: See vertical recording.

Hot plate: A heated table used for (a) softening the biscuits of record material prior to placing them in the press or (b) making flowed waxes.

Hill-and-dale recording: See vertical recording.

(Glossary of Disc-Recording Terms will be continued in the June issue of Audio Record.)

Roosevelt Record Album Released

"Rendezvous with Destiny," a two-volume record album of significant excerpts from the speeches of the late Franklin Delano Roosevelt was recently released by the National Broadcasting Company.

The album, compiled by Cesar Searchinger, noted author, historian, lecturer and news analyst, provides a permanent word picture of the years preceding and during the Second World War, highlighted by memorable utterances of America's Chief Executive, broadcast by NBC and recorded at the time.

Highlighting the significant events leading up to and during World War II, "Rendezvous with Destiny" is a complete two hour production. It constitutes a dramatic re-cap of current history and is the first in a series of NBC Documentary Recordings, designed especially for educational use.

Hand Made Studio A Success

(Continued from Page 3)

beginning. Footsteps, singing and various other noises from the floor above were readily transmitted through the ceiling. The only possible solution to this problem was to hang a second ceiling on the walls below the original ceiling and the space between the two filled with insulation material. The walls were then sound treated with one of the new war-found materials. The doors were made airtight and a modern control room was constructed.

In December, the installation was completed except for the decorating. This, of course, proved to be a spiritual uplifting task. Colorful drapes and streamlined furniture soon provided the necessary encouragement for the pair to finish their commendable job.

Justly proud of their efforts, Mr. Bubbers and Rossi opened Replica Transcriptions around the first of the year and judging from the few months of operation, the project is a financial success and plans are now being made for expansion.

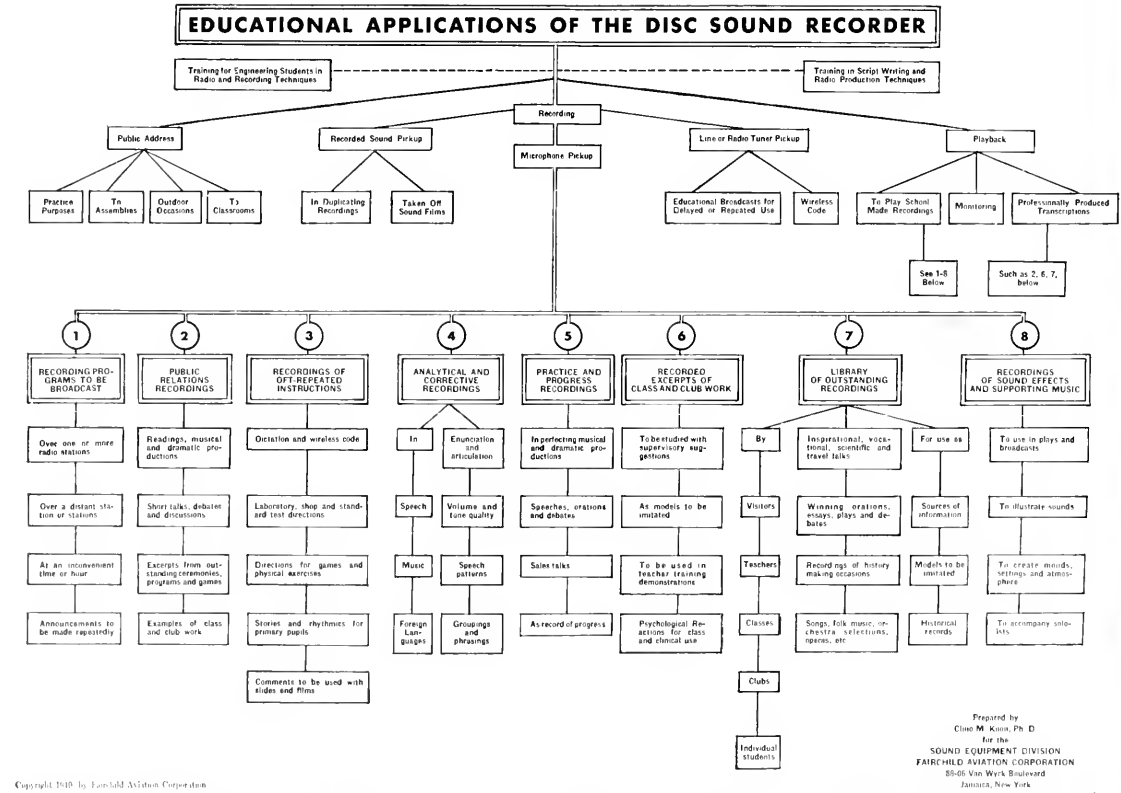
Recording At U. N. O.

(Continued from Page 1)

enter a control booth, where an engineer at a mixer panel monitors them. The sound is then piped to the public-address system; to ten control rooms used by American and Canadian networks and radio stations; to another control room, operated jointly by several international agencies which are beaming short-wave broadcasts of the meetings overseas; to television and movie booths; to interpreters' carphones; and, by six separate channels, to the recording room. Here, the proceedings of the Council are recorded on high-fidelity Audiodises and other recording blanks for reference and documentary purposes. More than 2,500 such discs are expected to be used during the current session.

More Time This Time

Happy over the fact that he was given two whole weeks to get things in shape for the peace meet, Major Vincent recalled that at San Francisco the entire installation had to be set up and ready for action in two days.



The educational possibilities of recording has attracted the attention of educational leaders everywhere, and today, its presence in the Speech, Language and Music Departments of colleges and universities is practically a necessity. Not restricted to the higher institutions of learning, the recording machine and the recording disc are coming into common use in secondary and elementary schools. Some of their numerous and diversified applications are suggested in the chart above which was prepared by the Sound Equipment Division of the Fairchild Aviation Corporation, Jamaica, New York. It is with their permission that we re-print it here.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2 No. 6 | 444 Madison Ave., N. Y. C. | June, 1946

Audio's French Associates Recent Arrivals In U. S.

Ravel and St. Hilaire Here; Old Acquaintances Renewed

Monsieur Lucien Ravel, managing director of "La Societe des Vernis Pyrolac," Audio Devices' associate in France,

Wm C. Speed greets Lucien Ravel upon his arrival from Paris.

and his partner, production manager and engineer, Monsieur Albert St. Hilaire arrived a few weeks ago in the United States from Paris.

Present at La Guardia Field to meet their French contemporaries were William C. Speed, Audio Devices' president, and other Audio representatives as well as members of the press.

Monsieur Ravel, who, during the latter part of the European war, sheltered eighteen American airmen in the woods on his estate in the little town of Porcheux, outside Paris, until they were liberated by advancing Allied forces, and Monsieur St. Hilaire, own controlling interest in La Societe des Vernis Pyrolac, a large paint and varnish company, located at 51, rue de L'Echat, Creteil (Seine), a suburb of Paris.

Albert St. Hilaire in the New York offices of Audio Devices.

Their connection with the recording industry dates back to 1929 when they

(Continued on Page 4)

Milton Berle, famous comic of stage, screen and radio recording another Cue-In broadcast. (Note earphones worn by Berle.)

Cue-In—Press Assn's New Recording Technique Localizes, Personalizes Transcribed Programs

After four years of experimental production, Press Association, Inc. radio subsidiary of the Associated Press, 50 Rockefeller Plaza, New York City, has introduced to radio a new recording technique that localizes and personalizes the transcribed broadcast.

Appropriately called "Cue-In", the new technique brings "big names" right into the smallest towns in America to talk with the communities' most popular announcer.

Only Replies Recorded

"Cue-In" works this way: In one of the four major recording studios used by the Press Assn. in New York, a famous personality in the news is interviewed by a Gotham announcer. The interviewed party stands alone in the studio before a microphone, with a pair of earphones draped over his or her ears, while in an adjoining glass enclosed control room, the announcer proceeds with his interview, which is heard by the noted guest through the earphones. The star answers each question and this reply is recorded. As only the replies are recorded, the disc naturally has a few skips or blank spots. These blanks, of course, represent the questions which,

(Continued on Page 4)

Incorrect Handling Fails to Alter Fidelity of '41 Discs

Upon his discharge from the Navy, after four years of service as a photographer's mate, Leo Kraus, recording enthusiast of New York City, learned that several of his prize Audiodisc recordings, that a friend had stored in a Manhattan warehouse, had been incorrectly and roughly stowed during his absence. He held little hope that such treatment did not materially damage the discs. However, to his amazement, when he played them back, they were as good as ever—the quality was indistinguishable from that of 1941, despite the fact that they had been stowed flat, under heavy weight, for more than four years.

WHOM Staff announcer Tom Murray assists Dolores Craeg during the recording of her daily broadcast "Highlight Special." Geo. Ellis, supervising engineer, is at the controls while Harold McCambridge, recording engineer, attentively watches his recording apparatus. Inset—Steve Hollis announces actual recorded broadcast of "Highlight Special."

WHOM--New York-Jersey City Finds Recording A Necessity For Successful Station Operation

Like other independent radio operators, Atlantic Broadcasting Company finds considerable and varied use for disc recording. In addition to the well-known commercial electrical transcription, Station WHOM—New York and Jersey City uses recording on a sustaining basis, employing the Standard Transcription Library to round out the musical portion of its shows, notably on the WHOM Caravan, daily from 2 p. m. to 6 p. m. and "Sunday Midnight Moods."

From a public service angle, recording serves a just purpose for relaying the currently urgent messages of the American Red Cross, United States Treasury Department, U. S. Army, March of Dimes and similar national agencies.

War Bride Interviews Recorded

With facilities in the studios at WHOM, recordings are made of special events on the scene and rebroadcast from the studios at a later time without interfering with the regular schedule. A case in point is a series of recordings made aboard the bridal ship "Argentina" when it arrived in New York. Interviews were conducted right on the ship on lines direct from the studios with brides of service men from the areas served by other Cowles Radio Stations, including WOL—Washington, WCOP — Boston, WNAX — Yanktown and KRNT Des Moines, as well as the New York and New Jersey areas served by

(Continued on Page 4)

U. of Neb. Radio Division Operates Recording Lab

Facilities Available To All Depts.

"The Recording Laboratory operated by the University of Nebraska Radio Division of the Department of Speech and Dramatic Art records the voices and instruments of university students, and faculty, and operates on a non-profit basis," writes Paul L. Bogen, Director of Radio at the university.

"Upon entering speech courses at the University," Mr. Bogen explains, "each student pays a fee for a disc to be used in his speech work. During the first six weeks of his course, in the middle and at the end of the semester, his voice is recorded. The student then has a permanent record of his speech improvement.

"Our Recording Laboratory is also used by other departments of the school which desire its services. Recordings are made for School of Music students to evaluate progress made in vocal or instrumental lessons. The Extension Divi-

(Continued on Page 4)

disc-data for the Recordist

By E. Franck, Research Engineer

FM and Recording

The prospective increase in number of FM stations, with their goal of 15 kc channel width, invites us to consider the technical problem involved in getting a signal of this wide range into the listener's homes.

Every element of the broadcast system will have to be considered, starting with the acoustical treatment at the studio and following through the microphone, amplifier equipment, telephone lines, transmitters, receivers and loud speakers.

When this improved range is realized, recording equipment will be called on to do as well or better. Let's take a brief stock of present day disc recording equipment and consider what needs to be done to extend the range to 15 kc.

Cutting heads which can handle 12 kc or higher are available and we have no doubt that this range can be extended easily. Loud speakers going this high are already available. Telephone lines can be made to handle it, but we think distortion will need to be reduced more. Receivers capable of this range, we are sure, will soon be available.

This leaves for discussion the cutting and playback styli, the lacquer disc and the pickup. Present day cutting styli are already doing a good job at 10,000 cycles and there should be no particular trouble in going higher, although some reduction in tip dimension may be required. Several experimenters have reported to us no trouble in putting 15 kc on a lacquer disc, as determined by optical pattern but none is too happy about what he has been able to take off.

Pickups almost get to 15 kc and there have been recent improvements, particularly in the direction of greater stylus freedom. More can be made, we are certain.

There will be some temptation to go to higher pitch, particularly if the styli's tip dimensions are reduced. By putting the grooves closer together, the inside diameter could be increased. An increase in the inner diameter from 7" to 9" at 33-1/3 r.p.m. would mean going from 1,000 wave lengths per groove inch at 12,000 cycles to 775 wave length per groove inch at 9" diameter. The unfavorable feature of increasing the pitch to get larger minimum diameter is the greater danger of tracking failures and some slight increase in noise level.

On the whole, the problem is not very difficult and our own belief is that in a relatively short time disc recording of 15 kc quality will become commonplace.

Recording "Vital" To Success of Foreign Language Students

Red Label Audiodiscs Used by Vermont French School

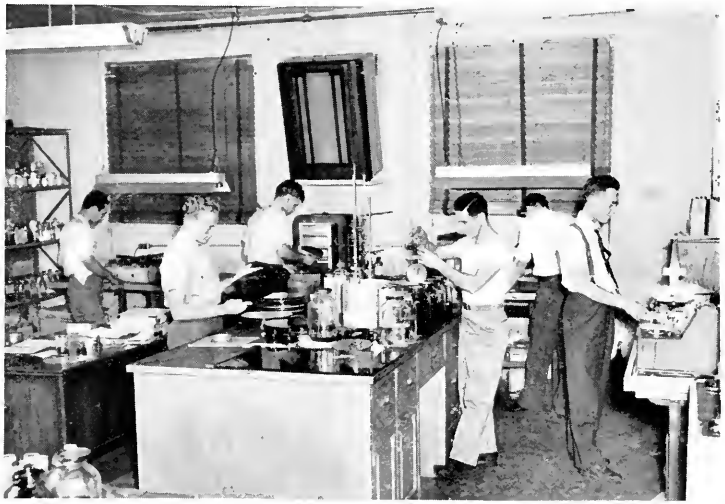
"One of the greatest difficulties in teaching the correct pronunciation and intonation of a foreign language to American Students, lies in the fact that they do not hear themselves speak," says Mr. Stephen A. Freeman, Vice President of Middlebury College, Middlebury, Vermont. Mr. Freeman, who has just recently returned to the Middlebury French School after 8 months service in the U. S. Army in France, as Chief of the Liberal Arts section of Biarritz-American University, advises the best way to help students make rapid progress is to let them hear recordings of their own speech in the foreign language studied.

Middlebury Recording Procedure Outlined

"For several years," Mr. Freeman relates, "we at Middlebury have employed the following procedure with excellent results: The student studies an assigned paragraph of French aided by the suggestions and advice of his teacher. He also listens to that same paragraph spoken by a native French person and recorded either commercially or at the school. The student listens to this recording over and over again, imitating it as closely as possible. When he feels that his imitation is perfect, he goes to the recording machine and makes a disc of his own rendition of this paragraph.

(Continued on Page 4)

One of the war's most carefully guarded secrets, a night-sight device that made it possible for U. S. Infantrymen and Marines to find and kill the enemy in total darkness by means of infra-red radiation was released from the Army's secret list recently and demonstrated at the 17th Regiment Armory in New York City. Present with portable equipment to obtain an Audiodisc-recorded report and interview for their Saturday afternoon radio program, "Around the Town," were John Cooper (second from left), reporter and commentator and Harold F. Schneider, recording engineer of NBC's Special Events Department.



A section view of the new Audio Devices research laboratory in Stamford, Conn.

New Research Laboratory In Stamford Conn., Equipped To Solve Many Recording Problems

Opening of a new research laboratory, believed to be the only one in the world devoted exclusively to sound recording and research in which product developments may be placed immediately in pilot production, then within a matter of a few hours subjected to rigorous performance tests, was recently announced by William C. Speed, Audio Devices' president.

Most Modern Equipment Available

The new laboratory, located at Stamford, Conn., is equipped with every known modern piece of electrical, electronic and other scientific apparatus as well as numerous specially designed instruments for the study of recording. It will permit measurements of tone distortion, record surface noise, wearing qualities and other features with a precision never before even attempted.

Exhaustive Tests Scheduled

Available facilities include provisions for exhaustive tests of discs and recordings under varying temperatures and humidity, as well as conditions of usage with various cutting and playback equipment.

"In the company's continuing studies of untried lacquers and other composition materials," Mr. Speed explained, "the laboratory is expected to develop findings which will further improve recording fidelity and broaden the field of sound reproduction."

Glossary of Disc-Recording Terms

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(Continued from Page 3 of the May issue of Audio Record)

Hot plate: A heated table used for (a) softening the biscuits of record material prior to placing them in the press or (b) making flowed waxes.

Instantaneous recording: A recording which may be used without further processing.

Label: The identification markings on paper or similar material, at the center of the record.

Lacquer discs: Discs, usually of metal, glass, or paper, which are coated with a lacquer compound (often containing cellulose nitrate) and used either for "instantaneous" recordings or lacquer masters.

Lacquer master: A term improperly applied to a "lacquer original" (which see).

Lacquer original: An original recording on a lacquer disc which is intended to be used for the making of a metal master.

(Continued on Page 4)

AMA Transcribes New Series

A new recorded series of thirteen fifteen-minute programs, entitled "The Melody of Life," are being cut for the American Medical Association by the NBC Chicago radio recording division, it has been announced by Frank Chizzini, manager of the division. The series, produced under the direction of Harriet Hester, will feature Dr. W. W. Bauer and Dr. William Boulton of the AMA as narrators on various medical subjects.

"Cue-In" New Recording Technique

(Continued from Page 1)

when the show arrives at its destination, will be supplied by the station's local announcer. Following the interview, a recorded dramatization featuring highlights in the star's life is presented. Then, the disc is packed, along with the program continuity, and sent to any of the many radio stations throughout the country.

Four Shows Now Available

"Cue-In" is not limited to interviews only. It may be used in dramatic skits with two or more persons, representing local talent, participating. At present, Press Assn. has made available to radio stations four "Cue-In" shows—STAR TIME, SPECIAL ASSIGNMENT, THE CLIFF EDWARDS SHOW and SPORTS STAR SPECIAL. These shows may be obtained either individually or as a package of four.

The "Cue-In" idea was created by Paul Girard, former program director of WBAL — Baltimore. The shows are under the direction of Alexander Leftwich, Jr. and are written by such well known scripters as Louis Hayward, Margaret Miller, Rafael Hayes, and James Beach.

Recording "Vital" To Success of Foreign Language Students

(Continued from Page 3)

The professor examines the recording, makes further corrections and comments, and then the student goes back to the listening booth where he listens to the original record and his own recording, alternately, to study the difference between the two. In this way he holds up a mirror to his own pronunciation and he is able, objectively, to eliminate his mistakes which, otherwise, he would never know he made."

Mr. Freeman further related that Middlebury College uses Audio Red Label Discs exclusively.

W. S. Morgan, Director of Radio (now on leave of absence) in the U. of Neb. recording lab.

Neb. Has Recording Lab

(Continued from Page 2)

sion of the University finds this service most valuable in sending discs to students and teachers for work in their courses.

"Recordings made by radio students at Nebraska," Mr. Bogen continues, "have proved to be of great value as a teaching aid. Various types of radio scripts and radio techniques are recorded for demonstration purposes. Students record the best newscasts and dramatic show of the semester and these are used for demonstration in radio classes the following year.

"In the Speech Improvement Clinic, recordings are made at the beginning of corrective lessons so comparison may be made of the progress in overcoming or correcting speech difficulties. The Clinic serves not only our students, but also people from the entire state and cooperates with the public schools of Nebraska in any speech correction work."

French Associates Arrive

(Continued from Page 1)

were approached by a customer who asked whether they could put a lacquer coating on a flat disc and thereby make a recording blank. Being keenly interested in various types of varnish and lacquer, they were immediately intrigued by such a project and in a short time, Mr. St. Hilaire developed a precision-machine method of coating which greatly accelerated quality production and Mr. Chadapaux, partner and chemist, developed special lacquer formulas.

This method was later patented and in 1938 Audio Devices made a contract with the French firm by which they were given exclusive rights to manufacture recording discs under the Pyrolac patent. And, so today, Audiodiscs are still manufactured under these same patents.

Glossary of Disc-Recording Terms

(Continued from Page 3)

Laminated record: A disc composed of several layers of material. Normally used with one thin facer on each side of a core.

Land: The record surface between two grooves.

Lateral compliance: The ability of a reproducing stylus to move laterally with respect to the record groove while in the reproducing position in a record.

Lateral recording: A recording in which the groove modulation is in the plane of the record and along a radius.

Lead screw: The threaded rod which leads the cutter or reproducer across the surface of the disc.

Lead-in spiral: A blank, spiral groove at the beginning of a record, generally having a pitch that is much greater than that of the recorded grooves.

Locked groove: A concentric, blank groove at the end of modulated grooves whose function is to prevent further travel of the reproducer.

Magnetic pickup: A reproducer employing an armature placed in a magnetic field and coupled mechanically to the reproducing stylus. An electric potential is generated in a coil placed in this field when the stylus is actuated by the modulated groove of a record.

Mother: A positive produced directly from the metal master or negative.

(Glossary of Disc-Recording Terms will be continued in the July issue of Audio Record.)

WHOM—Recording a Necessity

(Continued from Page 2)

WHOM. Immediately upon completion, the discs were air expressed to the radio stations in those other cities, bringing their listeners first-hand conversational information about the people they know and want to hear about.

As WHOM is a foreign language station, it is sometimes necessary to make recordings for spot-checking certain foreign language programs where there might be some doubt as to the content of the actual broadcast. Here again disc recording comes into it own and gives a true reproduction of what actually took place.

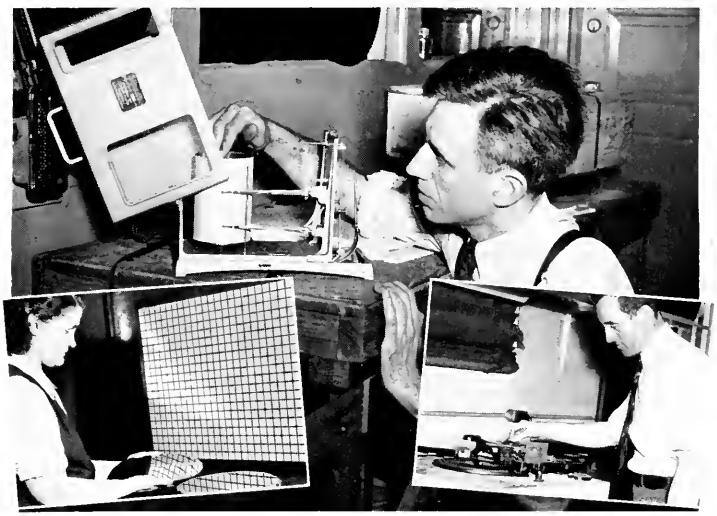
Recordings, whether supplied by a transcription company or cut in the studios, form an integral part of the broadcasting conducted by an independent station, and especially is that true of WHOM, broadcasting in Polish, Italian, Jewish, Russian and Greek as well as in English and thus reaching a more diversified audience of listeners than an all-English radio station.

audio record

THEY SPEAK FOR THEMSELVES

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2 No. 7 | 444 Madison Ave., N. Y. C. | July, 1946



Scenes from Audio Devices' movie "Audiodiscs—They Speak For Themselves." Above: Engineer examining hygro-thermograph. Left Inset: Inspector testing aluminum bases for flatness with mirrorgraph. Right Inset: Engineer operating machine which tests wearing qualities of discs.

Audio Devices' 16 m.m. Full-Color Sound Movie "They Speak For Themselves" Recently Released

AUDIODISCS — THEY SPEAK FOR THEMSELVES is the title of Audio Devices' new, full color, sound movie which depicts important phases in the production of Audiodiscs as well as detailed information on the proper method of handling and using Audiodiscs and Audiopoints.

Many Educational Scenes

The movie, 17 minutes in length, was produced by Pathescope Productions, New York-Hollywood in Audio Devices' plant and laboratories.

Among some of the interesting scenes in the movie are: the automatic washer which washes the aluminum blanks one by one to remove every trace of dirt and grease; the subsequent inspection of each base to insure that it is perfectly flat; the formulation and mixing of recording lacquers; the well equipped Audio laboratory where latest scientific devices tell just how every Audiodisc will behave today, tomorrow and every day thereafter; the noise level check — done by cutting a groove in the Audiodisc with the cutter terminals open; the wear test — where unmodulated grooves are cut and

(Continued on Page 4)

It's A Good Thing, Brother!

Some day I'm going to murder the bugler
Some day they're going to find him dead

That long-felt ambition of every G.I. took a setback recently when it was announced that the acute shortage of experienced buglers in the American occupation zone in Germany had necessitated a rush order to Army officials in the United States for 550 sets of recorded bugle calls. Seems that this distressing state of affairs came to light when the Special Service Section in Frankfurt became swamped with requests from organizations, minus buglers, who were having trouble routing sleepy G.I.'s from their warm bunks. The canned calls will be distributed throughout the European theatre as part of a new campaign to emphasize military discipline.

Great Value of Recording Stressed By Speech Head

Lectures on Theory Not Sufficient; Students Must Hear Their Errors

The Speech Department at Northern Illinois State Teachers College, De Kalb, Illinois, has found that the use of the recording machine is one of the most forceful ways of teaching good speech.

"We realize," writes Mr. W. V. O'Connell, Chairman of the Department of Speech, "after long experience, that lecturing on theory is not sufficient. The student seems to have a propensity for forgetting rules on theory which is accompanied by a comforting belief that his speech is not defective in either quality or pronunciation. His complacency is usually shaken when he hears his first recording."

At Northern Illinois State Teachers College where the beginning course in speech is required of all students, a recording of the speech of each is made at the beginning and at the end of each quarter. After the initial recording, each student has a private conference with the speech clinician who discusses his errors and makes suggestions for improvement. This has proved to be one of the most successful teaching devices, since the student cannot hear himself as others hear him until he has recorded his speech and heard it played back. At the end of the quarter the student makes another recording. A comparison of the two recordings is made to check improvement.

Not only in the fundamentals class is the recording machine used. The radio classes record programs which are analyzed and discussed by the instructor. Students in Interpretation and Dramatic Production also make recordings.

"One of the most valuable uses of the recording machine," Mr. O'Connell remarks, "is the help which is gained by the students playing a role in the college productions. At this time a student is strongly motivated to improve his speech and often spends a great deal of time working on speech improvement."

(Continued on Page 2)

Wm. C. Speed, Audio Devices' president bids good luck to Clarence C. Pell, Jr., company's national sales manager, prior to initial hop of air-borne service unit.

AudioDevicesCommissions Air-Borne Service Unit

National Sales Manager Estimates Unit Will Cover 50,000 mi. This Year

Audio Devices' new air-borne service unit, designed to implement a program of accelerated customer contact and technical educational service, was commissioned a few weeks ago at La Guardia Field in New York by the company's national sales manager, Clarence C. Pell, Jr.

The unit consists of a specially-equipped, single-engined Waco cabin plane, a technician when needed, and such sales or service material as the occasion may warrant and will permit brief or extended trips on short notice to all parts of the country. " We plan," Mr. Pell said, "to cover more than 50,000 miles this year on service calls alone. Also, if necessary, the unit may be pressed into service as an emergency delivery device in the event of sudden curtailment in freight transportation."

Solving the disc problems encountered by broadcasting stations; helping new FM stations establish proper recording setups; demonstrating techniques of sound recording in audio-visual training at schools and teachers' conventions and educating radio parts distributors and radio service men in recording technique are but a few of the many applications to which the new air-borne unit will be put.

"A service innovation in the recording industry, the unit," Mr. Pell said, "will permit Audio Devices to give many more times the service than could be rendered through use of other transportation methods."

New Technical Series

The first in a new series of technical articles, based on timely recording subjects and written by men prominent in the recording industry, appears in this issue of Audio Record.
(See Page 2, Col. 1)

Army Features "Duckworth Chant" in Current Recruiting Drive

The U. S. Army Second Service Command, in an effort to stimulate recruiting in the peacetime Army, recently forwarded to all radio stations in New York, New Jersey and Delaware a recorded transcription of three versions of the Army's famous Duckworth Chant, one of the most infectious and interesting drill chants developed in World War II.

Requesting that these stations cooperate in the current recruiting drive by using these transcriptions (2 min—1 min —and 50 sec spots) in whatever free time they had available in the course of daily broadcasting, the Army pointed out that it was their belief that the Duckworth Chant was a more entertaining way of aiding the drive than the usual one and two minute spot announcements of straight dialogue.

The Chant was recorded in the NBC Recording Studios in New York.

The Man With the Story

Mercer McLeod, world traveler, actor, writer and master storyteller, brings his best talents to the fore in the brilliant new NBC Recorded Series—MERCER MCLEOD . . . THE MAN WITH THE STORY. Recognized as one of Canada's greatest actors, McLeod enacts the parts of all male characters in his stories with astounding voice changes and differences of pacing. The strange, improbable but not impossible eerie tales are currently being heard over radio stations throughout the United States and Canada. Recorded in cooperation with RCA Victor, Ltd. in Toronto, Canada, MERCER MCLEOD . . . THE MAN WITH THE STORY is produced under the supervision of the NBC Radio-Recording Division.

Great Value of Recording Stressed By Speech Head

(Continued from Page 1)

In addition to the above work, the department also has an audiometer which is not only used by the Speech Department but also by the Health Clinic and the Training School in order to ascertain possible hearing defects of students. The department likewise has a mirrorphone which is used extensively for drill purposes and is considered a most valuable aid to students.

disc-data for the Recordist

By E. Franck, Research Engineer

Overmodulation and Overload

The correction of some faults in recording technique tends to be automatic, because the bad result is obvious and the method of correction is simple. An example of this is overmodulation. When too loud a signal is recorded, the cutting stylus vibrates so far that the grooves cut into one another. When the record is played back, this is detected immediately by distortion at the loud parts of the record, or advanced echos or cross talk caused when a groove is cut into or deformed by the next following groove. In extreme cases, as in the diagram, there may even be tracking failure. All these results are easily recognized and the correction is a simple matter of recording at a lower volume.

Overmodulation (use of too much volume) results in one groove cutting into the next. Occasional absence of "land" permits the playing needle, impelled by curving wave forms, to follow such a course as is indicated by the dotted line while normally it should follow the broken line.

Another fault usually found in records cut on portable machines is not so easily detected and we see signs of it repeatedly in discs cut by conscientious recording fans who make otherwise excellent records. We are referring to overload.

As a general practice, it is good to record close to maximum possible loudness for loud passages of music. This results in the greatest signal to noise ratio and minimizes scratch noise. However, many people using portable machines do not realize that their equipment cannot record to full volume without considerable distortion. This distortion is due either to overload in the amplifier because it cannot handle the necessary power or in the cutting head. It can be in both places. The remedy is the same as before, merely record at a lower level even though the modulation never reaches maximum at the loudest parts. The scratch level with good cutting styli and blanks is low enough to permit quiet records even though not recorded to top level.

The best check for this kind of overload is to record some music at top level and then again at 6 to 10 db lower. Both sets of grooves are then played back adjusting the volume control so that they are equally loud. If there is overload present, the portion recorded at a lower level will sound better. On some machines it is astonishing how much improvement there is when the recording level is kept below the overload region.

Tips for Handling Discs for Processing

By K. R. Smith, Vice-Pres.
MUZAK CORP., New-York-Chicago

(This is the first in a series of articles by leading figures in the recording field.)

A metal negative from your master disc cannot be better than the master recording supplied to Muzak. We are just as interested in helping our clients to supply a better product as they are themselves.

A fine original product means a perfect transcription, which results in increased sales for you and more work for us.

K. R. Smith

We have a few tips that will help us give you a better transcription.

1. Cleanliness — most important — assuming of course, your actual recording is good. Avoid dust, lint, finger marks especially. We can remove most of the free particles of dirt but finger marks etch into the coating and invariably cause noise.
2. Package your discs correctly. Where practical, use a glassine envelope. Don't pack so tightly that corrugated marks will be pressed into the surface of the recording. Results are noise and latticed appearance of finished product.
3. Don't be, "penny wise and pound foolish," about changing the stylus. If there is the slightest doubt about it being dull or chipped, replace it. Generally speaking, a bright reflective cut is an indication of a good stylus. As a precaution, every so often play back your test cut and listen for noise —don't forget a slight noise in your original is greatly increased on the vinylite pressing.
4. Proper cut depth is important — 60% for groove and 40% for wall—too deep may cause you to lay down less amplitude of modulation, too light — poor tracking.
5. Lay down, with proper depth cut, full modulation. This can be approximated by feeding your cutter with a 200 cycle frequency. Note VU meter for reading at full modulation of cut. You can see when this is attained by means of your microscope. Ride gain so that voice and middle low frequencies do not drive your VU beyond this point.

The Madison College orchestra; Clifford T. Marshall, directing. (All orchestra programs are recorded on Red Label Audiodiscs)

Recorded Discs Play Major Role In Obtaining Jobs For Talented Madison College Students

"Our recording equipment is the greatest aid I could hope for in orchestral training," says Mr. Clifford T. Marshall, director of instrumental music at Madison College, Harrisonburg, Virginia.

"Also," Mr. Marshall relates, "it is used for a great many purposes other than for music. For example, the English department uses it in connection with the Speech department. And here, like at many other colleges throughout the country, students record on one side of a disc at the beginning of the fall term and the other side the following spring. As the same script is used for both sides, progress is easily gauged by the teacher who does not have to rely on memory in estimating the student's grades. For this work, only 10" Yellow Label Audiodiscs are used."

Discs—Employment Aids

Madison College has also found that a recorded disc can play an important role in obtaining a job for a talented student when the distance does not permit a personal interview with the prospective employer. "For a matter of record," Mr. Marshall says, "on all but one occasion our student secured the position she applied for.

Audiodiscs for Speech and Music

"At Madison, we are very anxious to attain the highest fidelity that it is possible to obtain and we stress the faithful reproduction of the high frequencies. Our recording equipment is tailor made and includes the best components available. After trying every type and make of disc, we settled on Yellow Label Audiodiscs for speech recording and Red Label Audiodiscs for music."

Glossary of Disc-Recording Terms

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(Continued from Page 4 of the June issue of Audio Record)

Needle: (reproducing needle): A replaceable reproducing stylus (which see).

Needle drag: Same as stylus drag (which see).

Needle pressure: Same as stylus pressure (which see).

Optical pattern: The pattern which is observed when the surface of a record is illuminated by a beam of parallel light.

Orange peel: Mottled surface of a defective disc having an appearance similar to the skin of an orange.

Original recording: See lacquer original and wax original.

Overcutting: Excessive level in recording to an extent that one groove cuts through into an adjacent one.

Pickup: A mechanicoelectrical transducer which is actuated by the undulations of the record groove and transforms this mechanical energy into electrical energy.

Pinch effect: A pinching, or in some cases a lifting of the reproducing stylus, twice each cycle in the reproduction of lateral recordings, caused by the recording stylus cutting a narrower groove when moving across the record while swinging from a negative to a positive peak.

Playback: An expression used to denote the immediate reproduction of a recording.

Poid: The curve that the center of a sphere traces when the surface of the sphere is rolling along a sine wave.

(Continued on Page 4)

Chas. Baltin, WHOM program director, conducting "Pulse of the People" interviews. Show is recorded and rebroadcast at a later time.

New Transcribed Forum Heard Over WHOM

Current Topics Discussed

A new type of recorded forum program in which the man-on-the-street is given an opportunity to voice his opinion on current topics was launched recently on WHOM-New York—Jersey City, when "Pulse of the People" made its debut.

Charles Baltin, WHOM Program Director, discusses briefly the pros and cons of the subject and then proceeds to interview men and women on the street, seeking their opinions. After a representative group of passers-by have been interviewed, Baltin analyzes and summarizes the opinions expressed.

The show is recorded at noon on Thursday and broadcast the following Sunday evening from 5:05 to 5:30.

Audio Sound Movie Released

(Continued from Page 1)

subjected to several hundred playings as a device measures increase in noise level; the controlled weather room where every kind of climatic condition can easily be regulated for rigid tests; the misuses of Audiodiscs — scratching and scoring the recording surface with the drive pin—finger marking the disc—dropping the cutting head haphazardly on the disc; the proper method of inserting an Audiopoint—the correct angle and depth of cut . . . and many other educational scenes that will interest every recordist.

Film Available For Local Showing

Audio Devices plans to show this educational film throughout the country to distributors, engineers of radio stations, motion picture and commercial recording studios, colleges and home recordists.

For information on when AUDIODISCS —THEY SPEAK FOR THEMSELVES can be shown in your city, write to Audio Devices, Inc., 444 Madison Ave., New York 17, N. Y.

Glossary of Disc-Recording Terms

(Continued from Page 3)

Postemphasis: The complement in reproduction of pre-emphasis (which see).

Pre-emphasis: A method of recording whereby the relative recorded level of some frequencies is increased with respect to other frequencies.

Pressing: A record produced in a record-molding machine from a matrix or stamper.

Processing: Making the master, mother, and matrix (which see).

Recording head: Same as cutter (which see).

Re-recording: A recording made from the reproduction of a recording. (See also dubbing.)

Reference recording: Recording of a program or other material made for the purpose of checking same.

Reproducing stylus: The "needle" or jewel which follows the undulations in the record groove and transmits the mechanical motion thus derived to the pickup mechanism.

Rumble: Low-frequency vibration mechanically transmitted to the recording or reproducing turntable and superimposed on the reproduction.

Safety: A second recording, made simultaneously with the original, to be used for duplication should the original be damaged.

Shaving: Process of removing material from a wax disc of recording material to obtain a plane surface.

Shell or shell stamper: A thin metal matrix (generally 0.015 to 0.020 inch thick).

Spew: The excess record material which is ejected from the record press in the manufacture of pressed records.

Spread groove: A groove, with greater than normal pitch, cut between recordings of short-time duration, thus separating the recorded material into bands while still enabling the reproducing stylus to travel from one band to the next.

Sputtering: A process sometimes used in the production of the metal master, wherein the wax or lacquer original is coated with an electrical conducting layer by means of in electrical discharge in a vacuum. Sometimes called cathode sputtering.

Stamper: A negative (generally made of metal) produced from the mother (which see) and from which the finished pressings are molded. (See also matrix.)

Stylus drag: The expression used to denote the effect of the friction between the record surface and the reproducing stylus.

Stylus force: Effective weight of reproducer or force in vertical direction on stylus when it is in operating position.

Stylus pressure: Term sometimes erroneously used to denote effective weight of reproducer or stylus force (which see).

Stylus weight: Actually stylus force (which see).

Surface noise: The noise reproduced in playing a record due to rough particles in the record material and/or irregularities in the walls of the groove left by the cutting stylus.

Throw-out spiral: A blank spiral groove at the end of a recording, generally at a pitch that is much greater than that of the recorded grooves.

Throw-out tail: End of throw-out spiral (which see).

Tracing distortion: A harmonic distortion introduced in the reproduction of records because of the fact that the curve traced by the center of the tip of the reproducing stylus is not an exact replica of the modulated groove. For example, in the case of a sine-wave modulation in vertical recording, the curve traced by the center of the tip of a stylus is a "poid" (which see).

Tracking error: The angle (in a lateral recording) between the vertical plane containing the vibration axis of the mechanical system of the reproducer and a vertical plane containing the tangent to the record groove.

Transition frequency: The frequency at which the change-over from constant-amplitude recording to constant-velocity recording takes place.

Translation loss: The loss in high-frequency reproduction which occurs as the groove velocity decreases.

Turnover frequency: Same as transition frequency (which see).

Vertical compliance: The ability of a reproducing stylus to move in a vertical direction while in the reproducing position on a record.

Vertical recording (hill-and-dale recording): A recording wherein the groove modulation is in a plane tangent to the groove and normal to the surface of the record.

Vertical stylus force: See stylus force.

Wax: A blend of waxes with metallic soaps (also see cake wax).

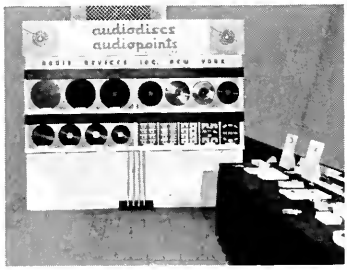
Wax master: A term improperly applied to a "wax original" (which see).

Wax master: A term improperly applied to a "wax original" (which see).

master.

William (or willy): A negative produced from a mother to produce still another mother.

Wow: A low-frequency flutter (which see).



Parts Show Huge Success

The 1946 Radio Parts & Electronic Equipment Conference & Show, held a few weeks ago in Chicago, was the most outstanding event in the history of the radio industry, according to figures released by Kenneth C. Prince, General Manager of the Show. More than 7,500 individuals registered for admission, and of these almost 2,500 were affiliated with distributing firms. The largest previous attendance at any trade show in this industry was 4,400, exclusive of radio servicemen and amateurs. 169 manufacturing lines and 14 publications occupied booths. Audio Devices' booth at the show is pictured above. This had four display cases showing steps in the manufacture of Audiodiscs, production of phonograph records from master discs by the gold sputtering process, the various types of Audiodiscs and the complete line of Audiopoints for recording and playback.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2, No. 8 | 444 Madison Ave., N. Y. C. | August, 1946

OPERATION CROSSROADS RECORDED

A-Bomb Correspondents aboard the destroyer TOFFEY off Bikini. (Top Row L to R) Lt. Wyman Riley, public relations; Fred Opper, ABC; Elton Fay, AP; Frank Allen, INS; Ralph H. Peterson, NBC; Don Bell, Mutual; Jos. Myler, UP; Don Mozley, CBS; (Lower Row L to R) V. Adm. W. H. P. Blandy, Comdr. Joint Task Force; Capt. C. H. Lyman, operations officer; Capt. W.C.Winn, Asst. operations officer; and unidentified navy chief quartermaster; Comdr. O. D. Waters, skipper of the TOFFEY. *Photo courtesy Broadcasting*

Complete Radio Coverage of Bikini Atom Tests Made Possible With Recording—Networks Say

The value of recording to radio in presenting the greatest "special event" in its history, the dropping of the world's fourth atomic bomb off Bikini Atoll, Sunday, June 30, was divulged recently to Audio Record by representatives of all four major networks.

As one network chieftain put it: "Recording was virtually a 'must' to radio because the various time changes and schedule arrangements often made it impossible to bring in 'live' our correspondents in the Pacific." Another chain official was in agreement saying: "The problem of atmospherics had to be considered carefully, making it far safer to pick up our men at Bikini whenever these atmospherics permitted the most suitable reception." "And then to," pointed out a third web representative, "recording made it possible for us to present our correspondent's views at a time most convenient to our thousands of listeners."

(Continued on Page 4)

Disc Tragedy

After selling a big show to a sponsor, one of the networks, believing that they could improve upon the audition disc, decided to alter the program here and there . . .

Later, at a gala celebration party at the Waldorf, a recording of the show was put on to entertain the sponsor. As the disc began and the revised edition of his purchase met his ears, the angered sponsor rose to his feet and shouted: "Did I buy that show? Cancel the deal right away!"

Atom Test Preparations Recorded by Coast Outlet

Land, Sea and Air Recordings Made; Many Technical Problems Encountered

One of the most interesting technically, and exciting of all radio broadcast station operations is the special events division. Fire, floods, wrecks, parades, sports—all jam into this classification. But the one to end them all probably was the recently-completed 15,000 mile trip by the special events department of KSFO and the Universal Broadcasting Company of San Francisco to the Marshall Islands, some 5,000 miles out in the Pacific, for a program giving a preview to the atom-bomb tests.

To provide not only a glimpse of the preliminary work being done for the atom-bomb tests, but also word pictures of the site of the test and other neighboring Marshall Islands, the natives, their customs and activities, and their reactions to the preparations being made, it was decided to make on-the-spot recordings.

With this in mind, our special events department received permission from Joint Task Force One to proceed to the Bikini area to make recordings of these preliminaries attendant to the atom-bomb tests. The crew of three was made up of: Ray V. Hamilton, executive vice president; Austin Fenger, West Coast radio reporter; and the writer.

It was the intent of the operation to take this basic program material recorded on locale, and then fly them back to our main studios in San Francisco. These recordings were to be assembled, some voicing added where necessary for station and commercial tie-ins, timed, and duplicate recordings cut from the master assemblage. They were then shipped via air to nearly 100 stations scattered all over the United States, who were subscribers to a series of 15 programs. While such a system has been applied before this was probably the largest and longest of its type.

It was expected that all kinds of engineering problems would be encount-

(Continued on Page 3)

Tom Slater presented with Headliner's Award for 1946 by Warren B. Francis, Pres. Elect of Natl. Press Club of Washington, D. C. Presentation was made recently at Atlantic City.

Special Award to Slater For Radar-Moon Broadcast

Audiodisc Recorded Feature Voted Best "Special Events Broadcast" of Year

The 1946 National Headliners' Club Award "for the best special events broadcast of the year" has been won by Tom Slater, director of special events for Mutual, in connection with the Mutual network broadcast of the Army experiments in which radar contact was established with the moon.

The citation to Slater was one of the 20 prized Headliner Awards, plus a special citation, which were announced recently at national headquarters. The awards, given annually in the field of press, radio and photography, were presented at a dinner in Atlantic City, on Saturday, June 22.

The MBS broadcast of radar contact with our lunar satellite originated in the Army laboratories at Belmar, N. J., and included the actual sound of the radar impluses as they were sped on their way to the target, some 240,000 miles distant, and the sound of the return echo approximately two-and-one-half seconds later. The broadcast also included interviews with Col. Victor A. Conrad, commanding officer of the Signal Corps Engineering Laboratories at Bradley Beach, and Lt. Col. John H. DeWitt, Jr., the officer under whose guidance the experiments were conducted.

The program was presented over Mutual on Sunday, Jan. 27, and was emceed by Mr. Slater. Through his efforts, a master recording of the broadcast is being presented by Audio Devices, Inc., to

(Continued on Page 4)

Audiodiscs Serve KDTH In Reporting Holocaust

Iowa Station Commended by Nation; Recorded Coverage of Fire Excellent

Station KDTH—Dubuque, Iowa, now places more emphasis than ever before on its recording department, especially since the news "beat" which was scored when Dubuque's Hotel Canfield burned to the ground last June 9th, killing twenty of the one hundred twenty-nine guests. (It was the second major hotel disaster in a week following the Chicago Hotel La Salle fire.)

After being alerted within a short time after the alarm was turned in, George Freund, KDTH News Editor and Bob Gribben, studio recording engineer, arrived on the scene with the station's portable recording unit and a supply of Audiodiscs ready to go to work. An on-the-spot, factual description of the fire was recorded and rushed to the transmitter which went back on the air at 2:40 A.M. to begin coverage of the hotel holocaust.

The station's 1000 watt transmitter gave across-country coverage through the use of the Audiodisc recording and supplied service equal to network coverage without the aid of a network.

Letters congratulating the station for putting its transmitter back on the air with the early and factual news report have poured into KDTH from distant cities throughout the entire country.

THE HAUNTING HOUR, an NBC Recorded program, features 52 half-hour dramatizations of original mystery stories written by radio's leading writers. The cast includes such prominent stars of radio, stage and screen as Berry Kroeger, Betty Furness, Frank Lovejoy, Neill O'Malley (right above), Michael Fitzmaurice (left above), and many other equally well-known personalities. THE HAUNTING HOUR satisfy's every listener's taste for mystery. It takes a panoramic view of the entire mystery field, and during the series every type of "creeper" is included . . . detective stories, psychological studies, tales of excitement and intrigue, stories of the supernatural and all other categories of mystery. Heard on stations throughout the United States and Canada, THE HAUNTING HOUR is produced by the NBC Radio-Recording Division.

disc-data for the Recordist

By Ernest W. Franck, Research Engineer

Enlarged View of Recording

The small dimensions of grooves and recording and playback points are always a handicap when one tries to visualize the exact mechanics of disc recording. It is thus helpful to imagine all dimensions increased to the size of something familiar in every day life.

Ernest W. Franck

Let's take a reproducing stylus and imagine the tip enlarged to the size of a pencil eraser. The eraser end of a pencil is a good choice since its tip will be roughly sperical just as the end of a playback stylus. The pencil eraser is about fifty times the size of a playback point.

Now we can imagine a reproducing point the size of a pencil eraser being guided along a groove. We have a close approximation to actual conditions if we further imagine that this groove was made with a recording point slightly smaller than a pencil eraser, so that tangential contact of the playback point is made at the sides and slides along without touching the bottom of the groove at all. Even with this great enlargement, the depth of the groove would be only slightly more than one-tenth of an inch.

Now for the speed—and here is where our enlargement is helpful. The grooves of a typical transcription run about 100 feet per minute (12" diameter at 33-1/3 R.P.M.). Multiply this by our factor of 50 and we find our eraser size point travelling along the grooves at a rate of 5,000 feet or nearly a mile a minute.

When we get used to this speed, we can modulate the groove and we find how busy a life the playback stylus leads. A groove fully modulated at 400 cycles per second is twisting back and forth five times every foot. The total amount of this weaving approximates the full width of the groove. The forward visibility from the tip of the stylus is about 2½ inches. Imagine travelling along at a mile a minute and not being able to see 3 inches ahead! At higher frequencies the turns will be sharper but will swing less. A 4,000 cycle groove will bend twice in ¼ inches, even at this fifty times enlargement.

Selecting and Training Recordists

by John E. Holmes
Supervisor of Recording, NBC—New York

(This is the second in a series of articles by leading figures in the recording field.)

The training of personnel in the engineering department of the Radio-Recording Division of the National Broadcasting Co., Inc., must be divided into several catagories.

In New York the engineering department of the Radio Recording Division has its own group of studio engineers who "ride gain" only on shows and musical productions for recording. There is a field group that do recordings with portable units. There is a group that is responsible for the electrical and mechanical maintenance of the complete recording plant. The final group, and that group whose training we will discuss is the recording operating group, the people who are responsible for the finished product.

John E. Holmes

The recording art in all of its detail is very highly specialized. Consequently there are few engineers available with an adequate background in this art. During the recent war there were no engineers available for the expanding recording department at N.B.C. It was during this period that women were first employed. It was the experience of the National Broadcasting Co. that the women thus employed in the recording department did a very satisfactory job.

The problem that first has to be met is to choose the proper type of person from among all people interviewed. It was found that it is best to find people whose background is somehow related and whose aptitudes can be adapted to the recording work. A real interest in recording is a prime requisite—for through experience we have learned that a person with the type of mind that can segregate and actively think of several jobs at once is particularly valuable.

The first step is to introduce the new employee to every type of recording unit and to acquaint him with the standardized methods of handling each. The second step is the familiarization with recording stylus and its particular function. Of course every possible fault of the stylus is taught and the instant recognition of these faults and their cure is very important. The next step is the basic electro-mechanical function of the recording head. The limitations and variations of the recording head is taught in easy stages as there are many specialized cases involved. The choosing and inspection of the recording blanks in all of its possible combinations is the next step.

(Continued on Page 4)

More than one thousand 17¼" Master Audiodiscs being rushed from La Guardia Airport to Los Angeles for the Armed Forces Radio Service. Millions of radio listeners in this country know about the work of AFRS through the now familiar announcement: "This program is being broadcast to our armed forces overseas through the world wide facilities of the Armed Forces Radio Service."

Recording Invaluable to Carnegie Drama Class

Speech Professor Praises Audiodiscs; Terms Them "Accurate Mirrors of Sound"

Each student in the Drama Department's Voice and Speech classes at Carnegie Institute of Technology, Pittsburg, Pa., makes an Audiodisc recording of his or her voice at the very beginning of the Freshman year. "And, after the individual's errors in this recording have been analyzed by his instructor," writes Miss Edith Warman Skinner, Assistant Professor of Speech, "corrective procedures are immediately prescribed."

Two Carnegie Tech. drama students check a recent Audiodisc recording.

"At the conclusion of the first year of study," continues Miss Skinner, "the student makes another recording—permitting his improvement to be conveniently and accurately gauged. This procedure is followed in the Sophmore year. The Junior year recording, however, is made of the ten or more dialects studied.

"Perhaps you would be interested in knowing," Miss Skinner relates, "that William Eythe, the M.G.M. movie star

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Atom Test Preparations Recorded by Coast Outlet

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ered on a trip of this nature and they were.

Much experience had been accumulated on a recent, similar-style trip to Hilo, Hawaii to cover the disastrous tidal wave which struck there. Thus we had a working knowledge of the type of equipment that might be needed. Applying this information we decided to take along three 6-volt storage batteries, a 350-watt rotary converter with adjustable speed control, a portable disc recorder (112-line feed), standard dynamic microphones, special audio amplifiers, filters, recording discs, etc. Total weight was approximately 500 pounds.

Among the problems we encountered were those caused by climatic conditions and excessive vibration in planes. Because of high temperature, recording levels had to be decreased by approximately 12 to 16 vu due to the recording head damping, thinning, and softening of the disc materials. Equipment had to be continually wiped and oiled, microphones protected from the moisture by Protec-Sorb bags, equipment cases kept dry by burning light globes in them, microphone cable plugs enclosed in sacks made of parachute silk, the recorder slung in a cradle of rubber exerciser cord to overcome plane vibration, high-pass filters used to reduce motor roar, and an advance ball used to keep the recorder head from skipping due to excessive vibration. The crew isn't joking when they say, "The equipment will be lighter, next trip"!

(From a paper prepared by Allan Kees, Chief of Audio Facilities, Station KSFO and Universal Broadcasting System—San Francisco for the July, 1946 issue of COMMUNICATIONS.)

Recording Helps In Atom Coverage

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During the week preceding the actual dropping of the bomb on the seventy-three ships jampacked in the Bikini lagoon, three of the principal chains aired many special broadcasts from the "Operation Crossroads" area. ABC, CBS and Mutual brought in their correspondents at regular intervals with the latest developments in the preparation for the "big show". All of these programs as well as special news bulletins from the Bikini area were recorded.

"This Week Around the World", a program devoted exclusively to the atom test, was presented by American Broadcasting Company on Sundays, June 23 and 30th. "Headline Edition", another atomic bomb feature with Pacific pick-ups was aired by the same net on Friday preceding the test. Mutual presented a special pool show entitled "Eve of the Atom Test" on Saturday, June 29 from 11:30 to 12:00 PMEDST featuring Secretaries Patterson and Forrestal, Generals Eisenhower and Spaatz, Vice Admiral Blandy and Admiral Nimitz. This program was recorded from the NBC Control Room in New York earlier in the evening.

On Sunday, June 30, Able-day at Bikini, American carried a special program at 12:30 PMEDST on which all ABC correspondents were heard. At 3:10, the same net aired the actual take-off of "Dave's Dream" for the target area. Later, on its National Hour, NBC presented Admiral Blandy from the Pacific from 4:00 to 4:30 PMEDST. The pool broadcast which was presented "live" over all networks, with Bill Downs, ace CBS correspondent on the scene, at 6:00 PMEDST, was rebroadcast by ABC at 11:15 Sunday evening. NBC's San Francisco outlet, KPO, also carried a rebroadcast of the event for its west cost audience.

When the stage is set for the dropping of the second bomb, net chiefs agree that they will again rely heavily on recording for radio's coverage of this history-making experiment.

Selecting-Training Recordists

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The normal training period is three months. During this time the new operator works with experienced personnel on the normal day-time shift. The supervisor in charge works with him or assign him to work with an "old" hand. At the end of the three month period the operator is allowed to do a little more of the actual work each day until such a time that complete confidence is gained. Usually a man is able to stand watch by the end of the sixth month and from there he learns that there is still much to learn about the art.

Recording Invaluable To Carnegie Drama Class

(Continued from Page 3)

and a former graduate of our Drama Department, told me some months ago that he played the first discs used in his speech classes and checked them with a recording of one of his recent movies. He said he had many laughs over his 'first talking pictures'.

"Our students," the professor concludes, "are fully aware of the invaluable aid of the Audiodisc in the study of Voice and Speech. It is possibly the actor's most important tool in the theatre for it makes a true and accurate mirror of sound."

Special Award To Slater For Radar-Moon Broadcast

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the Script and Transcription Exchange and by midsummer pressings will be available for free loan distribution. It is interesting to note that the Hayden Planetarium, New York City, earlier this year announced that a recording of the program would be played at regular intervals in their auditorium for a period of one month. Actually the time had to be extended a second month to meet popular demands. (Audio Record readers will recall that a full account of this historic event which was recorded on an Audiodisc appeared in our March Issue.)

PUBLISHED BY AUDIO DEVICES, INC.

Vol 2 No. 10 | 444 Madison Ave., N. Y. C. | November, 1946

Transcribed For Broadcasting

By J. Allen Brown
Assistant Director, Broadcast Advertising
NATIONAL ASS'N. OF BROADCASTERS

The radio industry did itself proud through its many contributions in behalf of the national war effort. All transmitters in the country (some 900 stations) broadcast dramatic war stories of American heroes. The civilian's role in the war was told, and every member of the family was encouraged to buy War Bonds to the tune of hundreds of millions of dollars.

J. Allen Brown

The Treasury Department's transcribed programs proved of inestimable assistance in the bond campaign. In fact, the success of this gigantic program hinged in large measure on the medium of recording. The Treasury programs were of superb quality; indeed, the best the industry had to offer in direction, talent and reproduction. And they were heard not only on the nation's most powerful stations but also—owing to the fact that they were transcribed—on the hundreds of small outlets which are so important in their respective areas.

In the field of special events and news coverage, recording facilities have made it possible for all stations to broadcast the most imaginative and colorful work of the world's greatest radio reporters.

The networks have recorded some of their memorable broadcasts so that affiliates might present them again, and in order that they might be made available to local clubs and institutions.

During the war, Edward R. Murrow, then chief of CBS World News Bureau in London, did an eye-witness report of a bombing mission over enemy territory. This spectacular broadcast was recorded from the network by CBS and shipped to affiliates. Under the title "Unorchestrated Hell", it was given repeat performances on many stations. In addition,

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The Hindenberg Disaster. At Lakehurst, New Jersey, May 6, 1937, the giant German dirigible Hindenberg exploded killing thirty-six persons. On the spot, describing the most tragic accident in commercial aviation's history, was a horror-stricken, half-crying radio announcer, sent from a Chicago station to record the landing of the huge ship. These recordings, broadcast later, shocked a spell-bound nation.

Veterans Administration's Recorded Series Features Outstanding Network Performers

Almost six hundred radio stations throughout the United States have booked the Veterans Administration's top-flight network talent transcribed series "Here's to Veterans."

Thirteen of the major web shows cooperated in the production of the series, making special recordings featuring information of vital concern to the nation's ex-servicemen and women.

Programs in the series are: Hit Parade, Waltz Time, Kollege of Musical Knowledge, Stairway to the Stars, Hildegarde, Supper Club, Great Moments in Music, Kate Smith, Highways in Melody, Danny Kaye, Saturday Night Serenade, Frank Sinatra and Fred Waring.

The Veterans Administration, producers of the series, worked in cooperation with the Advertising Council. The series was made under the direction of Jos. L. Brechner, radio service director for the VA, and Chas. E. Dillon, who supervised the national coordination of the series preparation.

Don Weiss, VA radio chief in New

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Just A Dud

One day during the late president's administration, a large mysterious package arrived at the White House. X-rays by government agents disclosed a solid black mass interwoven with wires. Baffled by this mystery parcel, the agents took their problem bundle to an isolated spot in the country—dug themselves a protective foxhole—tied a rope around the package—suspended it from the branch of a tree and cautiously pulled the other end of the rope. Nothing happened. Only a deep "thud". The package, it was found, contained nothing more than 10 or 12 recorded discs—speeches of Winston Churchill. The Prime Minister had sent them as a gift to F.D.R.

"I Guard F. D. R."—Sat. Evening Post

"Victorious Living"—outstanding religious educational program, featuring the dramatic narration of the Rev. E. Jerry Walker (at microphone), being recorded in the Chicago studios of the World Broadcasting System. Howard Petersen lends effective background music at the organ.

ICRE Transcribed Program Heard Over 164 Stations

FCC Praises Educational Recordings

The International Council of Religious Education and its forty constituent Protestant denominations have found the electrical transcription the answer to a long-vexing problem. Realizing that "a pulpit, a minister and a microphone" do not constitute effective religious broadcasting, the ICRE sought ways and means to serve individual communities with professional-quality religious programs on a minimum budget. The answer was found in a transcribed series "Victorious Living" now nearing completion of its second year on the air with 164 outlets.

The series features the dramatic narration of the Rev. E. Jerry Walker, trained commercial radio man, the effective organ background of Howard Petersen, occasional additional talent and sound effects. The series is produced by Bev Dean, Manager of International Radio Productions, in the studios of World Broadcasting System of Chicago.

The program content revolves around true life stories in which religion is seen at work. The series was cited to Congress with praise by the FCC and was given an award by the Ohio State Institute for Education by Radio.

Realizing that the average local interdenominational group is unable to af-

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Tom Harmon Spurns "Live" Offers for Recorded Show

Football-Movie Committments Practicability of Discs Decides Issue

Tom Harmon, former Michigan football great and winner of every important pigskin award including the Heiseman and Robert W. Maxwell Trophies, is currently being heard over many stations on a new recorded football series titled "Here Comes Harmon".

Tom Harmon, ex-Michigan football star and Vick Knight well known radio producer. Harmon's recorded football forecasts are heard weekly over many stations throughout the country.

Produced and transcribed by Vick Knight, outstanding producer of many "live" and recorded radio shows, and Criterion Radio Features, Chicago, the "Here Comes Harmon" stanza features the ex-Wolverine star's gridiron predictions of all important games in the country each Saturday. During the 1945 season, Harmon scored 87.8% correctly in his prognostications. His Bowl game

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Transcribed for Broadcasting

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a digest was published in booklet form.

George Hicks, ABC war correspondent, covered another of the war's most exciting stories by means of recording. Stationed on an Allied warship, his recorded description of enemy planes attacking the ship in the English Channel during the Normandy invasion was an outstanding news story, and was made a "pool" broadcast for all networks, and recorded for public sale throughout the country.

During the early part of the war, the Mutual Broadcasting System gave spot news every 30 minutes in which recording facilities played a major part for broadcasting and re-broadcasting big news events.

A decade ago, one of the biggest news stories of its day was the explosion of the German Zeppelin Hindenburg as it approached its New Jersey mooring station after an Atlantic crossing. The passengers were caught like insects on burning fly paper. Many of them somehow extricated themselves and jumped to serious injury or death on the ground below. All this was described by the horror-stricken, half-crying radio announcer, as recording machines caught every sound and reverberation. These recordings, broadcast later, shocked a spell-bound nation.

Transcribing for delayed broadcasts is routine programming in radio. It is especially heavy during the summer months when time conflicts develop because of daylight savings time. The American and Mutual networks present a large number of delayed broadcasts in keeping with the various time zones.

Many stations make a regular practice of recording a network show which comes down the line at the time occupied by a permanent local program. The delayed show is presented later in the day, or perhaps the next day. Facilities for recording in the studio offer a wide range for more effective programming.

The finest talent in the world from such entertainment centers as New York and Hollywood are being made available to every station in the nation today by syndicated transcription companies. Top skills in producing, directing, acting and music, go into the creation of shows especially transcribed for broadcasting.

Perhaps the largest commercial transcription network of its time was the General Motors advertising campaign in behalf of Chevrolet some ten years ago. Over 400 large and small stations throughout the nation broadcast this series. Reports had it that no other commercial program in broadcasting history up to that time had been heard over as

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Requirements For Good Phonograph Recording

By Albert Pulley
Chief Recording Engineer
RCA VICTOR RECORD DEPT.

(This is the fourth in a series of articles by leading figures in the recording field.)

If I were asked to name the most important requirements for good phonograph recording in the order of their importance I would list them as follows:

1. Fidelity and performance of the electrical equipment used in the recording channel.
2. Perfection of mechanical equipment with respect to accuracy and constancy of speed, groove dimensions, etc.
3. Studio acoustical properties and microphone placement.
4. Ability of the recording engineer to adjust the equipment to give the proper "balance" and other conditions necessary to accomplish a good recording.

Albert Pulley

These are the factors which are given the most consideration before a recording session takes place at the RCA Victor Recording Studios.

They are not the only element that go into the making of a technically good master phonograph record, but they are the basic considerations. If any of these factors is sub-standard, it follows that the finished product will be below par.

There is an honest difference of opinion among engineers, musicans, and music lovers as to exactly what constitutes the "perfect" recording and what bearing it has on the above requirements. This is particularly true with respect to the third requirement—studio acoustical properties and microphone placement, as they determine the "quality" of the finished record. It has long since been established that what is required by one or more acoustical engineers as a technically perfect studio may not always provide a record performance satisfactory to the greatest number of listeners. Music critics have their own ideas about what music should sound like. We can't please everyone so we think in terms of pleasing the greatest majority of people who listen to records in their homes.

To do that, we have to decide what problems must be overcome before the artist reaches the studio. We must select the proper microphones for the type of instrumental or vocal recording being made. We decide upon the proper microphone placement, as determined by the composition of the group making the recording. The correct choice of microphones and their proper ratio or "balance" between the several voices of the orchestra that is essential to the perfect recording.

Aside from attending to purely technical considerations, such as fidelity of the electrical components of the recording system and the perfection of the mechanical devices used, which permit of a true relation between what is heard on the monitor speaker system and the finished record, the recording engineer must be constantly alert to detect extraneous noises that will mar the quality of the finished recording.

The fourth requirement listed—"the ability of the recording engineer to adjust the equipment to give the proper musical balance and other conditions necessary to accomplish a good recording" is a vital one. In addition to adjusting the microphone pick-up for the proper "balance", the engineer must make sure that the volume range resulting amplitude of cut is within prescribed limits during the recording, in order that the record may be played on all phonographs with maximum fidelity.

If these requirement are satisfied, what is generally considered as a "perfect" recording should be obtained.

Broadcasting exercises and dances is nothing new for a radio station but to broadcast into thirty-two different physical education classes in Tacoma, Wash., public schools took some ingenuity on the part of KTBI-Tacoma. When classes in the old-time Western square dances grew so large that Bob Hagar, physical education director, could make it around to only a tenth of the schools a semester, KTBI devised a system where a "prize" dance class is selected each month and the dances to be used on the regular Wednesday morning broadcast are recorded ahead of time. Now, over 5,000 school children dance to the broadcast every week in what officials call one of the most successful school broadcast ideas ever developed.

Transcribed for Broadcasting

(Continued from Page 2)

many stations for a single sponsor. This was possible only through the medium of recording.

In the national spot field, the transcribed announcement not only conveyed its messages and sold products, but set the nation to singing the "Pepsi-Cola song", the "Chiquita Banana song" and others. In recent months millions have been educated by Chiquita not to put bananas in the refrigerator. This ingratiating one-minute singing commercial told the banana story, assisted in the "food for famine" campaign, and has now become a contender for a bright spot on the Hit Parade. Dance bands over the networks, on platter shows and in juke boxes, have the nation doing the rhumba to its rhythm and singing its catchy phrases.

The memorable fireside chats and dramatic network speeches of the late President Franklin D. Roosevelt were recorded by the National Broadcasting Company and made available in albums to the government, to museums, and to various historical and educational institutions.

Radio has progressed to the position of "number one public servant", thanks in part to those events and ideas which were TRANSCRIBED FOR BROADCASTING.

A few hours after being elected as the sixth general of The Salvation Army in charge of work in 97 countries all over the globe, Gen. Albert Orsborn (pictured above while broadcasting over the BBC chain), was broadcasting a message to the people of America over the Columbia network. His talk was recorded and is now being sent out by the Salvation Army to its officers in the field as an addition to its series stressing the Army's expanded program of aid, "Marching Forward To A Better World," N.B.C. and Mutual previously had aided the organization in its recording work.

Top Stars In VA's Series

(Continued from Page 1)

York, and Lou Marks of the VA's Washing staff handled the production of ten in the series—these shows originating in New York. Dean McNealy handled the production and transcription of other shows originating in Hollywood.

The series was recorded by NBC Recording. Initial arrangements with agencies and sponsors were made by Drew Dudley of the Office of Mobilization and Reconversion, and George Ludlum of the Advertising Council in New York.

Complete press brochures were sent to all stations in the country, providing press releases, promotional material and full information on the series. Stations then filled out an enclosed card, mailing it to the VA's Central Office in Washington. Within a few days the set of thirteen programs was in the hands of the stations requesting the series.

Each of the programs in the transcribed series is a "capsule" edition of the big network show making the transcription. The stars themselves, or the regular program announcers, read the helpful informational spots (two on each program) which took the place of the normal commercials. Each of the 14:30 shows end with a one-minute theme tag over which the local station announcer reads a brief message giving the address, telephone number and location of the nearest Veterans Administration office.

Production has already begun on a second series of 13 programs.

ICRE Transcribed Programs

(Continued from Page 2)

ford big-time radio production and that network broadcasts could not afford the advantage of effective local tie-ins, the International Council of Religious Education turned to the transcription as the answer. Local ministerial groups, councils of churches and religious education are enabled to tie in their own local messages with the ET's, rented from the ICRE. The production budget is underwritten by the 40 denominations and their publishing houses. Thus through the medium of transcription, a six-a-week broadcast is possible under local sponsorship at minimum cost to the participating groups.

Harmon Spurns "Live" Show

(Continued from Page 2)

predictions were 100% correct.

Before signing his present recording contract, Harmon, employed by WJR-Detroit before his entrance into the service, turned down "live" network offers to do another sports feature, in favor of transcriptions, in the expectation of getting greater station representation and more time for his many other activities.

Harmon, a member of the champion Los Angeles Rams and husband of movie actress, Elyse Knox, will soon be seen in the forthcoming Monogram musical "Sweetheart of Sigma Chi". It will be his third movie appearance.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 2, No. 11 | 444 Madison Ave., N. Y. C. | December, 1946

RCA MAKES BILLIONTH RECORD

Frank M. Folsom, Vice President RCA Victor receives the Billionth Record from J. W. Murray, Vice President in Charge of RCA Victor Record Activities at the RCA Victor Camden, N. J. factory. NBC broadcast the presentation of the famous disc.

Milestone Reached In Company-Record History; Record's Original Sound Made On An Audiodisc

A few weeks ago in Camden, N. J., where forty-eight years before the Victor Talking Machine Company was founded, the one billionth RCA Victor record was manufactured . . . thus marking a milestone in the history of the company as well as the record industry itself.

The original sound of the billionth record — a performance of two John Philip Sousa marches by the Boston Symphony Orchestra under the direction of Serge Koussevitzky — was cut on a standard Red Label Audiodisc.

The historic disc, after being gold-plated, was given to Major General A. H. Turnage, Assistant Commandant of the United States Marine Corps, who accepted it in the name of the Corps, for inclusion in the Marine Corps archives. The choice of the Marine Corps as the recipient of the billionth record has a historical significance which is directly related to the two compositions performed by the Boston Symphony—"Semper Fidelis" and "Stars and Stripes Forever."

(Continued on Page 2)

Come West, Young Men . . . . . at our expense

In promoting a recent fashion show in Hollywood, Foote, Cone & Belding, on behalf of their client Cole of California, nationally known fashion designers, sent recorded invitations (8" discs) to leading fashion experts and dealers throughout the country.

The novel invitations, when received by the prospective guests, were believed to be a gag, but after rushing off to the nearest play-back machine and hearing the voice of Fred Cole inviting them to a special showing of his latest creations (at his expense), the lucky designers dropped their scissors and hustled out their suitcases for a few peaceful days in sunny California.

Importance of Recordings To Norwegians During the Dark Days of War Told . .

American Radio Urged to Remember "Ordinary People" of Other Lands

By Gladys Petch, Radio Consultant
NORWEGIAN INFORMATION CENTER
New York City

It's somewhat out of date nowadays to talk about an enterprise born during the war, and yet if this article is to be written, one must start in 1941, for it was then that the Royal Norwegian Information Service, an agency of the Royal Norwegian Government, started recording the programs "The Spirit of the Vikings" and "Norway Fights On." Since 1929 the writer had been in the habit of broadcasting from leading radio stations from coast to coast, about "Norway," its culture, its music, its people, and its beauty. Then came the war, and travelling having become almost an impossibility for civilians, the idea of recording these programs was conceived.

Starting with one station in the middle west, gradually the number of stations was increased until in 1942 three hundred and fifty stations throughout the U. S. and Canada were carrying the Norwegian programs weekly. Records were also sent to Australia, New Zealand, and Alaska. And so the story of Norway's gallant fight against the German invaders was told around the globe.

The programs were always quite simple, Norwegian airmen, sailors from the Norwegian Merchant Marine, and members of the Norwegian underground told thrilling stories of their actual experiences, told the facts as they had lived through them, without any embellishments, and it seems that these plain facts, reached right into the hearts of listeners.

Many of these brave men have since made the supreme sacrifice, for the ideals for which they fought, but thanks to the art of recording, their voices and stories will live on, testimonies to the brave men who gave their all.

Through our recorded programs it was possible during the long war years to

(Continued on Page 3)

Pictured above with announcer William Cullen (at left) are three featured players in the new ABA recorded series now being offered to banks throughout the country for local broadcast use. Left to Right—Abby Lewis, Scott Tennyson and Walter Vaughn.

American Bankers Ass'n. Offers New ETs To Banks

Recorded Dramatizations To Be Used As "Core" of 15 Minute Program

As part of a new radio service for banks, the American Bankers Association recently announced a new series of recorded dramatizations for local broadcast use. These recordings, all on bank loan services, are about 4½ minutes in length. They are intended for use as the "core" of 15 minute programs, the balance of each show being supplied by the local station from its musical library. According to John Mack, Deputy Manager of the A. B. A. in charge of its advertising department: "This is the first step in a new radio service. If these programs are well received, we will prepare plenty more. As a second step, we hope to progress to complete 15-minute programs. Another angle we will pursue is the gathering and disseminating of radio data to banks to help them use radio more effectively."

There are 30 programs in the new series. Each presents a modern day loan problem, such as a small business financing situation, or a veteran home-purchase transaction, and works out a sensible solution, usually with the help of credit. Thus the series is largely educational and has little if any commercial flavor. Local tie-in is obtained by the bank's own announcement, spoken by the local announcer at beginning and end of each show.

The transcriptions were written by Frank Kane, supervised by the A. B. A. and recorded by the National Broadcasting Company in New York.

Announcements have been mailed to all banks and free sample recordings have either been supplied or offered to every radio station in the United States accepting commercial programs. Banks have been urged to contact their local radio stations and arrange auditions.

RCA Produces Billionth Disc

(Continued from Page 1)

From 1880 to 1892 John Philip Sousa was leader of the Marine Corps band. In 1888 he composed "Semper Fidelis," which is the motto of the Corps. In February, 1902, several years after he had resigned from the Corps to form his own band, he recorded the stirring march tune for the Victor Talking Machine Company, which was then in its infancy as a manufacturer of records and phonographs. "Semper Fidelis" was so successful that it was recorded again and again by Sousa and his band, as well as other bands that made records for the Victor Company.

In the spring of 1946, when it became apparent that the RCA Victor Record Dept. was certain to manufacture its billionth record before the end of the year, the Boston Symphony Orchestra—which was the first full-sized symphony orchestra to record for Victor—was asked to record some single records. Dr. Serge Koussevitzky chose the two marches by John Philip Sousa as among the compositions he would like to record. Some months later it was agreed that to this particular recording would go the honor of becoming the company's billionth disc. Because "Semper Fidelis" is so closely identified with the Marine Corps it was quickly decided that the most logical recipient of the milestone record would be the Corps.

Aside from the historical aspects of the record itself, the manufacture of the billionth disc in 1946 is of particular significance as a symbol of the revival of an industry which several times in its history had seemed to be giving way to

(Continued on Page 4)

THE THREE SUNS AND A STARLET, one of NBC's newest recorded musical programs, features Artie Dunn at the Hammond, Al Nevins' electric guitar and Morty Nevins' accordion. Added to this are the song stylings of Nan Wynn, Irene Daye and Dorothy Claire (pictured above during program rehearsal), three top vocalists of the day making this show a real musical treat. A 15-minute program, it's packed full of rhythm-bright melodies with completely different improvizations by THE THREE SUNS. An NBC Syndicated show of network caliber, THREE SUNS AND A STARLET is sold to stations throughout the United States and Canada.

disc-data for the Recordist

By Ernest W. Franck, Research Engineer

Magnetic Tape Recording

In recent years there has been considerable activity in recording on magnetic wires or thin metallic tapes. The recording process, which is merely passing a wire almost as fine as a hair through a varying magnetic field, is not disturbed by vibration or movement and, therefore, found extensive military application during the war, such as recording in a moving tank. Furthermore, the wire can be wiped off and a new recording made at will.

Ernest W. Franck

During the war the Germans used a form of magnetic recording wherein metallic wire was replaced by a plastic tape with a very thin coating of magnetic iron oxide. This was used extensively in portable field models of the "Tonschreiber". Considerable development was also done of a high quality "Magnetophone" for radio broadcasting use, generally referred to as the studio model. Army and Signal Corps men coming back from Europe were loud in praise of the studio model and their reports of its performance placed it above any magnetic recording available here and actually in a class with lacquer discs.

It was only recently that a studio model "Magnetophone" was brought into this country and, through the efforts of Mr. E. Y. Webb, Department of Commerce, Communications Division (see page 3), a public demonstration was made.

The performance is nothing short of startling. The volume range is great and under ideal conditions may reach 60 db. The frequency response is flat to 10,000 cycles when equalized. The motion is perfectly steady with piano music, comparing favorably with a high quality 35 mm. sound on motion picture film.

Without question, this machine, which is the first of its kind to approach lacquer discs in performance, will find many applications, but it must first get over many hurdles. The drive mechanism must continue to give steady motion after long daily use, as in broadcast work. Some means must be found to keep playing time constant in spite of changes in length due to tape stretching and slipping. The tape may be too thin for sprocket holes, but many electronic means have been suggested, and one may be feasible.

Besides a good machine, a good tape is needed and American manufacturers must develop the equipment and technique of coating magnetic recording tape. This activity would quite naturally devolve upon people already in the field of making a sound recording medium by a coating process, such for example as Audio Devices. Actually this work was undertaken in this company some time ago in anticipation of probable developments in this field.

OTS Making Available To American Industry Many Wartime Secrets

Edwin Webb Gives Demonstration of Magnetophone Before IRE Gathering

One of the Government activities which is most interesting to American business firms, engineers, educational and research institutions, is the Office of Technical Services, Department of Commerce. The OTS, Mr. John C. Green, Director, has assumed the functions performed by the Office of the Publication Board. It also includes the Technical Industrial Intelligence Branch, the National Inventors Council and the Production and Development Division.

Edwin Y. Webb, Chief, Communications Unit, OTS

The OTS gathers on-the-spot technical information in enemy countries and prepares reports based on comprehensive studies of enemy industries. It solicits and evaluates ideas and inventions of value to industry, provides informed advice on patents and inventions and serves as a general information bureau on technical data in the possession of the Government.

The OTS also sponsors industrial research projects and negotiates and supervises the execution of contracts with private non-profit research laboratories for the development of such projects. It acquires, abstracts and indexes scientific and technical documents, both American and foreign, and publishes the Bibliography of Scientific and Industrial Reports.

Readers of Audio Record will be particularly interested in the Communications Unit of the OTS under the direction of Mr. Edwin Y. Webb. This Unit has investigated and prepared reports on hundreds of machines, equipments, components and materials connected with the communications industry. It has also arranged showings of these products both in Washington and throughout the country. Earlier in the year models of the "Tonschreiber", the German field model machine for recording sound on tape, were received and shown to thousands of interested engineers. More recently the studio model "Magnetophone" was received and a demonstration given on November 5th at the Department of Commerce Building, Washington, D. C., before the local chapter of the Institute of Radio Engineers. This meeting was also attended by Mr. William C. Speed, President of Audio Devices, and Mr. E. W. Franck, Research Engineer. (Note page 2 for Mr. Franck's comments.)

Author Bob Hope meets the critics on WQXR—New York's "Author Meets the Critics" program when Hope's "So This Is Peace" came up for discussion. Shown above left to right are Russell Maloney, contributor to The New Yorker; Bennett Cerf, author and editor; Hope, and John K. M. McCaffery, moderator of the program.

Whether Presented Live or Recorded .. WQXR's "Author Meets the Critics" . . Good Listening

Some of the liveliest wit and most informative debate to be offered the soap opera ridden radio public today is heard on "The Author Meets the Critics" literary free-for-all, broadcast twice weekly (once live; repeat broadcast recorded) by WQXR, The New York Times radio station, and once a week by the Mutual Broadcasting System.

This half-hour program puts showmanship into book reviewing by pitting the author of a currently popular book against two well-known critics in a free-swinging discussion appealing not only to book lovers and to those who relish argument over current problems but also to the non-literary who enjoy seeing intellectual celebrities humanized by sharp-witted remarks by their peers.

During the first fifteen minutes of the program, which is broadcast from the Barbizon Plaza Radio Theater from 9:30 to 10 P. M. on Thursdays (live) and rebroadcast (via transcription) on Sundays at 2:30 P. M., the two critics attack or praise the book of the day, with few holds barred. The second fifteen minutes are devoted to the author's frequently indignant or irate response. A moderator, John K. M. McCaffery, associate editor of American Magazine, often mentioned by radio reviewers as a likely candidate for the diplomatic service, urges the three to "disharmony" and at the same time strives to keep them to the point and to prevent the strong-minded, violently opinionated celebrities from mayhem. The reaction of those

(Continued on Page 4)

Importance of Discs Told

(Continued from Page 1)

bring home to American listeners, in fact to listeners in the whole free English-speaking world, the story of Norway's fight against Nazi oppression at home and the story of Norway's war efforts. The story of a small country which refused to give up her democratic way of life no matter the cost.

There were other ways in which these recorded programs were of value too. There are approximately 2-3 million Americans of Norwegian descent in the U. S. A.; people with loved ones in Norway, people who had no means of communication with their mother country for five long years. To these, these programs were probably a vital source of information—in fact we have many letters in our files confirming this. Here for example is a quotation from one such letter. This woman writes: "Your recorded programs are the strongest link we have with Norway in these dreadful days. Keep up the good work and thank you."

Another interesting point was that Norwegian communities were discovered in states which are not usually associated with Norwegian-Americans, as for example Arizona. From stations in Arizona

(Continued on Page 4)

Recorded Talks of Noted Relief Administrator Now Available To Radio Stas.

A Child's Life In Northern Europe Today Explained in Transcriptions

"Children of Northern Europe," an authentic, interest-catching recorded series, recently released by SAVE THE CHILDREN FEDERATION, New York City tells of the dramatic struggle of these nations back to peace-time living . . . and the effect of that struggle on Scandinavian boys and girls.

Dr. Kershner

Four transcribed 15-minue programs, on two double-faced 16-inch discs, carry eye-witness reports of Dr. Howard E. Kershner, noted relief administrator, during his current tour of Europe. Dr. Kershner's colorful talks were recorded while scenes were vivid in his mind, in modern radio studios in Helsinki, Finland; Stockholm, Sweden, and Oslo, Norway. Clear and sharp, free of usual trans-Atlantic static and fading, the talks were air-expressed to New York where they were re-recorded with music and explanatory announcements.

The four transcriptions (the first three of which must be carried as a series; the fourth is optional) titled "The Struggle in Finland," "Child Refugees in Sweden," "Norway Recovers" and "Meeting Child Needs in Northern Europe (a round-table discussion in New York City by outstanding relief administrators) are being forwarded to radio stations throughout the country for sustaining broadcast use. There is no rental charge for the recordings. Stations may order the series for auditioning purposes by addressing a post-card to SAVE THE CHILDREN FEDERATION, 1 Madison Avenue, New York City.

SAVE THE CHILDREN FEDERATION is the U. S. member of the International Save The Children Union, which has headquarters in Geneva, Switzerland, and member organizations in 34 countries.

RCA Produces Billionth Disc

(Continued from Page 2)

other forms of musical entertainment. Today, record manufacturers estimate in excess of 300,000,000 discs will be manufactured this year, the largest production ever attained and from three to four times the prewar output.

Importance of Discs Told

(Continued from Page 3)

many interesting letters from Norwegian Americans were received. Norway deserves much credit for developing this work, and there are 100 stations in the U. S. and Canada who still regularly carry Norwegian programs. Other countries have now followed Norway's lead, and in closing this brief article, the writer, a broadcaster of many years experience in Europe and the U. S. A., would like to make a suggestion. Now when the United Nations needs the support of every citizen of every nationality, could not every radio station of the United States devote a certain length of time to recorded programs of other countries with whom we **must** get along if we are to exist at all!

Not only should there be broadcasts of the proceedings of the U. N. Council which are of course of vital interest, but there should also be broadcasts about the things ordinary men and women of the world want to know about each other, their problems, their home life, their customs and opinions, for fundamentally human beings are the same the world over, with the same fears, hopes and ambitions.

What a chance American radio has to correct this, and at no loss to themselves, for the voice of America would become the voice of the ordinary people of the world whose earnest desire is to be understood, and to "keep the peace."

New York State Radio Bureau Plans Extensive Use of ET's

In furthering their effort toward stamping out juvenile delinquency in the state of New York, the N. Y. State Radio Bureau has prepared for the Dept. of Correction and the Commission Against Discrimination a series of recorded dramatizations and panel discussions for broadcast use by the commercial stations throughout the state.

The recorded dramatizations are cut in the WOR—New York Recording Studios; the discussion series in Albany, the state capital.

According to Miles Heberer, Director of the N. Y. State Radio Bureau, present plans call for the use of transcriptions throughout the winter. Many of these programs are now underway and others will be developed in a few weeks.

Author Meets The Critics

(Continued from Page 3)

authors who dare submit to this ordeal is as varied as the subject-matter covered in a program of this scope.

Martin Stone, owner and producer of "The Author Meets the Critics," and an Albany, N. Y. newspaperman, Richard Lewis, conceived the idea for the program in 1940. It was originally produced at Union College, Schenectady, N. Y. and was broadcast locally in Schenectady and Albany until it moved to New York during the war.

TED HUSING RETURNS TO ALMA MATER

"Ted Husing's Bandstand," featuring the dean of the nation's sportscasters in a new role as a disc jockey, is currently being heard Monday through Saturday from 10:00 A. M. to 12:00 noon and from 5:00 P. M. to 6:30 P. M. over WHN—New York. (It was at WHN that Husing first entered the "big time" as a sports announcer some 20 years ago.) Ted's individuality and fluency at the microphone blends the "Bandstand" show into something out of the ordinary. The man who has consistently picked the top sports figures through the years keeps right on picking winners in the field of popular music.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3 No. 1 | 444 Madison Ave., N. Y. C. | January, 1947

RECORDING—EDUCATIONAL MEDIUM

Birmingham, Ala. Salutes Birmingham, England

WAPI — Birmingham — BBC Exchange Discs; Contrasts in Life There-Here Told

"Birmingham, Alabama Calling Birmingham, England!" What, something new in lend-lease? Well no, not exactly.

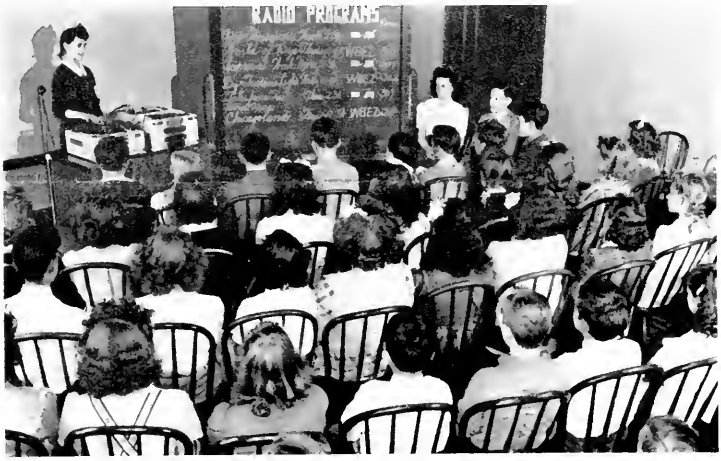
A few weeks ago, WAPI—Birmingham, Alabama broadcast a special salute from the people of its fair city to the residents of Birmingham, England. And, one week later, the English city retaliated by airing a special program to their American neighbor of the same name.

The two broadcasts, both recorded, told the story of the highlights in the everyday life of the people of both countries. For instance, in the Alabama city, WAPI recording crews interviewed a typical Birmingham resident while he worked at his job in a local steel mill, asking him many personal questions, such as: how he liked his job; how much money he made; how he spent it; what he liked best in the way of entertainment and many more such questions.

Knowing too, that the women of Birmingham, England would want to know the inside slants on how American women raised their children, the WAPI roving reporter interviewed a housewife with such inquiries as: how her children were fed; what they were fed; what entertainment she most enjoyed; how she enjoyed cooking; her favorite dish, and what was her recipe for cooking southern fried chicken.

Ambling into the corner drugstore, WAPI's inquiring microphone eavesdropped on three typical Alabama youths (two girls and a boy) while they were passing along to each other the latest American slang. The reporter ended his stay by giving his British listeners a complete description of an average American drugstore, complete from toothpicks to electric heaters, chocolate sundaes to castor oil. And so it went on, one interview after the other, until WAPI knew more about Birmingham, Alabama, its

(Continued on Page 2)



A group of Chicago elementary school pupils listen to an educational recording in their classroom.

Transcriptions—Recorders Supplement Other Modern Teaching Aids In Today's Classrooms

By George Jennings, Director,
Radio Council—WBEZ Chicago Public Schools

There is hardly a teacher or school administrator today who does not recognize the value of radio in the classroom . . . but, many teachers and administrators are not aware of the vast amount of teaching material which is now available on transcriptions. This material has all the attributes of radio . . . the inherent dramatic quality, the immediacy, the vitality . . . plus many important attributes of its own.

These attributes are not so much in the content of the transcribed programs as they are in the medium of presentation . . . namely, the recording itself. While the techniques of using the transcription are in many ways similar to those of using the radio broadcast, the disc has the great advantage of permanency and of frequent re-usability. Also, the machine may be stopped at any time during the course of the transcription, the head lifted, put back and any part of the disc replayed.

One of the greatest difficulties of scheduling radio broadcasts for schools is the seeming inflexibility of school

(Continued on Page 4)

SOUR FATE

Recently, Urban Johnson, head of the WBBM—Chicago sound department, decided to make a recording which would explain some of the difficult assignments radio sound technicians often encounter in providing realistic background for dramatic shows. "Urb" asked Mort Hall of the continuity department to write a trial script, something full of drama, pathos and intrigue. The result was a story of a jealous husband, a nagging wife and—the strangest sound on record—the sound of a man in a vinegar vat being slowly pickled to death!

Radio Daily

audio record
PUBLISHED BY AUDIO DEVICES INC

VOL. 3, NO. 1 JANUARY, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Use of Top-Flight Talent Key to I. D. E. Success

Outstanding Public Service Recorded Programs Praised by Radio Industry

In its seven-year history the Institute for Democratic Education, a unique non-profit organization has produced and distributed an impressive body of transcribed radio shows which has earned it top rank with radio stations and other critics. Devoted to the advancement of American ideals, the Institute has utilized the best professional talent—writers, actors, musicians, directors—to turn out transcriptions that have pioneered a proud path in the realm of public service programs. Each of its LEST WE FORGET series of 13 or 26 recordings, all genuine Americana, has been made available free to radio stations, bringing power-packed educational entertainment to millions of Americans.

Harold Franklin, IDE program director and Sam Levene, Hollywood motion picture star, discuss merits of "Hey, Cabbie!" script, one of the programs in the new IDE series—LEST WE FORGET—THE AMERICAN DREAM.

IDE's tenth series LEST WE FORGET—THESE GREAT AMERICANS achieved unprecedented airing, afforded more than $250,000 worth of free time. Using big names to recreate dramatically the big people of our nation, the series features among others John Carradine as Woodrow Wilson, Ralph Morgan as Joseph Pulitzer, Quentin Reynolds as Wendell Willkie and Melvyn Douglas in the program on Franklin D. Roosevelt. This latter show was played by 710 stations as part of the regular series broadcast and as a memorial tribute on the first anniversary of FDR's death. The entire series has been given 1,700 hours on the air by 622 stations. In 1946 there were 7,000 individual broadcasts with many stations playing particular programs four or five times for special occasions. IDE shows were given 52% class "A" time and among the stations using them were 100 of 5,000w and 10 of 50,000w strength.

After radio broadcasts have been completed, the Institute makes recordings available to schools through 25 distribution centers centrally spotted over the country and previous series are being circulated among 1,900 schools. During the war, the Army and OWI used the programs which also reached an international audience via short-wave.

IDE was among the first to apply successful advertising techniques to public service programs, using dramatic spot announcement to carry its democratic message.

Two new projects in the working stage at the Institute promise good listening and learning. One series, LEST WE FORGET — THE AMERICAN DREAM, dramatically probes the problems of prejudice and inter-group rela-

(Continued on Page 4)

Recordings "Publicity Tool" In Negro College Fund Appeal

Electrical transcriptions were used for the first time in the short existence of the United Negro College Fund during the recent annual appeal for funds to meet current expenses of thirty-three Negro private colleges.

Under the direction of Bob Masson, who handled all radio activity for UNCF four five-minute transcriptions were made, two on a side, each using the volunteer services of an outstanding Negro entertainer. They were: Kenneth Spencer, currently featured baritone in "Showboat"; Josh White, cafe-society entertainer; Ella Fitzgerald, the "Tisket-a-Tasket" girl; and the Mills Brothers. Each recording included a short "pitch" for the Fund.

One hundred sixty discs were made and distributed to an equal number of radio stations in fifty-four major campaign cities. A final check has not as yet been made as to the extent to which these recordings were used, however, preliminary reports indicate the United Negro College Fund met with a reasonable degree of success in having the transcriptions played. A representative of the Fund remarked that he felt UNCF would continue to use recordings as a regular part of their publicity program in connection with their annual appeals.

Alabama Station Salutes English Outlet In Disc Swap

(Continued from Page 1)

likes and its dislikes, than it had ever hoped to know.

Each portion of the Alabama city's salute was woven together with a musical bridge and a narrator to tell the story of Birmingham, and to weave the continuity around each interview. All interviews were later redubbed onto regular 16" discs for air-shipment to England.

The Birmingham, England salute to the people of Birmingham, Ala. told the British side of the story and pointed out the contrasts between life in England and life in the United States.

Yes, this is something new in lend-lease.

MILTON CROSS
ORALEXICOGRAPHER!

ORALEXICON is the name given to a new series of record albums, produced by NBC's Radio Recording Division in New York, seeking to standardize the pronunciation of difficult words and foreign names that are so often mispronounced on the air and in daily life. (The first edition is devoted entirely to classical music nomenclature and terminology.)

As radio's oldest and most popular announcer and commentator of classical and operatic music, Milton Cross was chosen to set up a standard of pronunciation that could be followed successfully by English speaking announcers and music lovers everywhere. Milton Cross is, therefore, the world's first ORALEXICOGRAPHER, and the ORALEXICON the first Recorded Pronouncing Dictionary for Classical Music.

The School of Radio Technique, situated in Radio City and America's oldest school devoted exclusively to radio broadcasting, designed the ORALEXICON specifically for announcers, commentators and students who have long felt the need of a pronunciation standard that could be learned easily by ear and followed with confidence.

In addition to the names of the world's most famous composers of classical and operatic music, ORALEXICON gives Milton Cross' pronunciation of: Popular Grand Operas, Contemporary Orchestral Conductors, Samples of radio continuity for Operatic and Symphonic Programs, and finally oft-used Musical Terms with exact definitions. The album consists of 4-12 inch Vinylite records (8 sides), a 20 page Manual of Instructions and mimeographed copies of the continuity used.

Material Shortages and Recording Under Adverse Conditions Big Headache

By John Bubbers
Studio Engineering Supervisor
WOV—New York

(This is the fifth in a series of articles by leading figures in the recording field.)

During the war . . . and it's shortages, many strange situations arose that often called for quick action. More often, "haywire" repairs had to be devised to make things function in a "normal" sort of way. Even the simplest of parts were at various times impossible to get and stocks were in some instances nearly depleted before the replacements came through.

John Bubbers

The tube situation became critical during the latter part of '43 and after taking careful study of the demand, it was found that a certain type would last only eight weeks under operating conditions. Close analysis of the problem showed cathode leaks in all of the failures. This was attributed to insufficient removal of heat from the area surrounding the tubes. A few feet of duct work connecting to our fresh air supply from the air conditioning apparatus reduced our losses to ten percent of the original.

Problems of misaligned cutting heads proved to be a severe headache since time lost in their repair also had to be minimized and spacers and jigs were devised to permit their alignment by unskilled personnel. A rather strange thing occurred one hot afternoon when we were transporting an old portable cutting unit by car to a very isolated location. Upon arriving, we found that the dampening mechanism had lost its original resiliency and would not function properly. This was rectified by locating the nearest refrigerator and cooling it down. The cutter then functioned normally.

Other precautions of supply were at first unpredictable, but as we soon learned . . . our rule was "expect the worst." The quality of recording discs, fortunately, was maintained, even though the supply at times was rather limited.

Looking back, our problems of the war years have taught us ingenuity and foresight and their memory is cherished only because these problems are in the past.

A section view of the Kasper-Gordon recording studio with acoustical-correction diffusers arranged in random pattern on one wall.

Fay Photo, Boston

Acoustical Properties of Recording Studio Improved By Use of Semi-Spherical Diffusers

(From an article prepared by Forrest L. Bishop, Chief Engineer, Kasper-Gordon, Inc., for COMMUNICATIONS)

With high-fidelity reproduction a must characteristic of all types of recording today, the studio has become a major fidelity factor. For it is in the studio that many basic problems can originate. It has thus become necessary to develop or redesign studios that have a minimum of acoustical faults.

In our Boston studios we were faced with a problem of boominess resulting from phase distortion and reverberation. Our early analysis of the acoustical properties of the studios indicated two major factors contributed to the defect: the small room dimensions and the construction of two walls, a long wall on the control-room side and a short wall meeting the long one at right angles, both of which were surfaced with painted wallboard.

A series of test recordings were made and measurements were taken at various positions in the room with a sound level meter at frequencies from 30 to 10,000 cycles. In all measurements, high peaks appeared in varying degrees within the range of 100 to 150 cycles together with long hangovers of reverberation.

Since absorption had proved a failure, we believed that diffusion might bring about the desired effect. The conventional treatment would have been polycylindrical, but we decided to use semi-spherical diffusers. We believed that we would have greater control over the amount and quality of diffusion by the addition, subtraction and placement of the diffusing semi-spheres.

The spheres were made from a cement and cellulose mixture, easily molded to the desired size and shape. The semi-spherical sections ranged in size from 12 to 36 inches across. When permanently attached, they were bolted to the walls by special steel brackets. In determining the position of the diffusers, they were arranged in random pattern, more diffusers being used at the end of the studio where less life was desired. To carry out the principle of diffusion still further, a convex pane of plexiglass was installed in the control-room window.

The resulting acoustical improvement was evident immediately. Those familiar with the studio recognized it by ear alone. The series of test recordings and measurements which followed proved that all boominess had been eliminated. Both speech and music were recorded with high-fidelity quality. Piano recordings, which formerly were made with great difficulty, could be cut with fidelity at all instrumental amplitudes. A chorus of 60 recorded in our small studio, a procedure that would have been impossible in the old studio. And the disc reproduction was excellent.

Beauteous movie queen Betty Grable and young daughter Vicki amble through some of daddy's (band leader Harry James) latest recordings in their Hollywood home.
Photo by Kornman as appeared in Photoplay

Recording In Today's Classrooms

(Continued from Page 1)

schedules, particularly on the secondary level . . . another difficulty is the course of study. Most teachers in high school keep all their classes reasonably close together in their work. If one class listens to a broadcast chances are it is the only class so-doing, and no matter how much the radio program may add to that class it is put behind the others whose schedule did not fit the broadcast time. There's no such difficulty with the transcriptions. Every class in every course of study has the opportunity to hear the same material. All classes are kept on an equal basis. Schools equipped with recorders may, of course, record any "live" program and re-broadcast it later over their own p.a. systems at a time most convenient for classroom presentation.

The material that is now available on discs astounds most educators when they first become acquainted with it. The great industrial companies, such as Westinghouse, General Electric and others; the airlines; the trade associations—all have material available, generally without cost to the school. Frequently material (which usually carries no other advertising material than that the disc is presented by "the blank research laboratory") on discs becomes the permanent property of the school.

In this connection, many schools have contacted their local radio stations for transcriptions which are no longer usable on the airwaves but are extremely valuable in the classroom.

The United States Office of Education publishes an extensive catalog of recordings and transcriptions which are available to schools on either a loan or a permanent basis. Many professional magazines, such as the Journal of the Association for Education by Radio, present reviews of current recorded material and frequently list availabilities.

There is still another use of transcriptions in the school that is equipped with recording machines as well as playbacks. The easiest way to learn a foreign language is to listen to it; the easiest way for a speech student to correct his mistakes is to listen to a recording of himself. Speech correction classes, public speaking classes, dramatic groups all may benefit by hearing playbacks of their activities.

The progressive educator will not depend upon discs and transcriptions to the exclusion of all other teaching aids. He will use them along with radio, motion pictures, maps and charts, models, and in some schools even television, as a further means of making his teaching dynamic, meaningful and vital to his students.

Fine Talent Key To IDE Success

(Continued from Page 2)

tions in terms of plain people—ordinary Americans whose backgrounds make them vivid story material. Employing a striking new technique of listener identification, the programs achieve a maximum of personal projection of the hearer into the situations of the average people who are the heroes of the programs.

IDE is run by men who know the job of radio and democracy. Its Board of Governors, headed by the Dean of Boston University, Howard M. LeSourd, includes such names as Norman Corwin, Paul Lazarsfeld, Lyman Bryson and Philips Carlin. Harold Franklin is the Institute's program director.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3, No. 2 | 444 Madison Ave., N. Y. C. | February, 1947

ABC Network Follows Byrd Expedition By Recordings

Lee Van Atta, INS Writer, Reports For Web From Antarctic Task Force

By plentiful use and reliance on recording, the American Broadcasting Company has been able to air a series of several interesting and newsworthy broadcasts direct from the Byrd Antarctic Expedition on its news programs throughout the last month. Differences in time plus uncertainties of atmospheric conditions have made it necessary that the network protect itself against program failure by use of recordings on these spots.

Lee Van Atta

Since the Byrd Expedition sailed from Norfolk, Va., early in December, there have been eight pick-ups broadcast over ABC, with Lee Van Atta, International News Service correspondent, representing the network. Several of these broadcasts were in the nature of regular newscasts, while others might be classed as having definite entertainment value. On Christmas Day, for example, the American web played a recording of a broadcast from Van Atta in which the Navy Choir was heard in a program of carols and a benediction by the Chaplain on board the U.S.S. Mount Olympus, flagship of the Byrd fleet, was also heard. These broadcasts, picked up early in the morning of Christmas Day, were played back to the nationwide radio audience several hours later, thus enabling the network to fit this timely program into a round-the-world Christmas Day celebration show.

Van Atta's broadcasts have described the departure from Norfolk, interviews with Admiral Cruzen, an excellent word picture of the arrival at Balboa, an interview with Dr. Siple, former Eagle Scout who accompanied Byrd on his first Expedition into Antartica, and other informative interviews with various experts and crew members attached to the present expedition.

A singularly colorful broadcast by the

(Continued on Page 2)

Here, NBC's new system of auditioning talent, a plan which makes extensive use of recording, is shown in operation. A group of the network's directors hear and make notes of a disc on which a "staged" program had been cut. Called Actor's Audition Showcase, the new system means a better opportunity for aspiring radio actors.

NBC Introduces New Auditioning Procedure; Discs, Index To Talents of Radio Hopefuls

A file of recordings likely to determine the future of many a young radio actor is being built up in the Radio City studios of the National Broadcasting Company in New York—an ever-expanding index to the talents of actors and singers who aspire to fame on the air.

The file is the result of NBC's newly-inaugurated Actor's Audition Showcase, in which auditioning actors are given scripts, extensive direction and coaching and finally—backed up by sound effects and organ music for bridges in the script—a record is cut as if the show were on the air.

These sessions are held each Tuesday evening, and on Thursday afternoons NBC's national production manager, Robert K. Adams, calls the 25 directors on his staff together to hear the production of the week. The 30 minute record is played, and when the final cue has been given, the directors hold a round table discussion of the actors on the show. Some applicants are considered good enough for parts on forthcoming productions, and others are ruled out as not yet ready for the air. The record is

(Continued on Page 4)

NOW, YOU TELL ONE

Ever heard of a sponsor who cancelled his air time because his announcer had done such a good selling job that he couldn't satisfy the demands of anxious customers? Well it happened. Here's how: Maurice Hart, KFWB's ultra smooth disc jockey, on his "Start the Day Right" show, played several recorded tunes, unannounced. Those listeners who guessed the correct title were to be awarded a free portrait by the sponsor, Amos Carr Photo Studios of Hollywood. Within 24 hours over 500 letters had poured into the station. At the end of the week, the rather awesome amount of 3,638 had piled up in the KFWB mail room. Mr. Carr had had enough. Expecting at the most a few hundred leads, he was forced to cancel his 1 minute spot and his offer.

audio record

VOL. 3, NO. 2 FEBRUARY, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Use of Classroom-Radio Taught Capitol Teachers

Educational Importance of Recording One of the Key Subjects in Course

Recently, through the cooperation of WTOP—Washington, CBS and the Washington, D. C., Public School System, a new course of study for teachers in the use of radio in the classroom was opened at Wilson Teachers College in the capitol city.

Hazel Kenyon Markel
Harris & Ewing Photo

Under the direction of Miss Hazel Kenyon Markel, Director of Community Service for WTOP, the course, open to teachers and others interested in making use of radio in education, will give college credit for the weekly two-hour lectures.

In a special letter to Audio Record, Miss Markel advised that since the objective of her classes was to train teachers in the effective use of radio in the classroom, recording will be taken up as a closely allied aid in this field. "The problem of transcription uses," Miss Markel said, "will be treated from the following standpoints:

a. Brief history of the recording field
b. Advantages of recordings for the teacher.
c. Limitations in the use of recordings.
d. Available sources of information on recordings for classroom use.
e. Methods of effective utilization in the classroom.
f. Important developments in the recording and transcription field."

"Under 'b' (advantages)", Miss Markel continued, "will be considered the possible flexibility in use and lasting quality of recordings, the ability to preaudit the program and therefore prepare effectively for its use, the ability to repeat a program if desirable or to interrupt it for discussion by the class, and the ability to retain the program for use from time to time.

"Under 'c' (limitations) will be noted lack of adequate equipment in schools, the cost of such equipment, and the limited life of recordings.

"Under 'e' (methods) for effective use will be suggested good equipment, current and good quality recordings, careful selection of the program and effective preparation for its use, close correlation with classroom work and with students' previous experiences, immediate and carefully planned follow-up procedures. The specific techniques, of course, depend on the type of program and the teacher's motives in its use, but good methods for the use of classroom aids in general apply to the use of recordings.

"Under 'f' (trends) we will consider late types of recording equipment, wire and film recordings, possibility of schools buying equipment with both transcription and playback facilities, teachers being trained in the use of both audio and visual aids and the possibility of transcription services for education programs."

In announcing the special course, Dr. Clyde M. Huber, Wilson College Registrar, and also Chairman of the Radio Committee for the public schools of the District of Columbia, stated that it is the first direct effort to acquaint teachers of the Washington schools with the techniques of utilizing radio as an educational aid.

Dr. Hobart M. Corning, Washington's Superintendent of Schools, also urged teachers to take advantage of this opportunity for intensive study of a medium from which children get a large part of their education. "Teachers should know how to use radio programs in their classrooms, just as they are familiar with the techniques of using visual aids such as charts and motion pictures," Dr. Corning emphasized. "Through hearing good programs in school, experiments have shown that children's out of school listening habits can be greatly improved."

ABC Network Follows Byrd Expeditions By Recordings

(Continued from Page 1)

ace INS writer told the story of the crossing of the Equator, with the customary hazing of the "neophytes" by the veteran "mossbacks"—those who have made the crossing before. This broadcast was even more colorful and remarkable in that it contained an exclusive interview with King Neptune himself, possibly the first time that the omnipotent "Monarch" has ever been heard by an American radio audience.

Throughout the course of the Expedition, ABC will continue to record Van Atta's stories, interviews and newscasts, and will replay them for radio listeners on many of their news programs.

disc-data for the Recordist

By Ernest W. Franck, Research Engineer

Tips On Increasing Disc Life

Lacquer discs are often used to record material of sentimental or historical value, particularly personal or home recordings. It is usually desirable to play these from time to time without fear that too frequent use will wear them out. With reasonable handling lacquer discs can be played hundreds of times without any marked wearing, but with careless handling or poor playback equipment they may be badly worn in a dozen playings.

Ernest W. Franck

To get the greatest use from lacquer records, treat them after recording as if they were still new blanks. Handle them by the edges to avoid making finger marks, and keep them in envelopes or album. Remember, only one to an envelope. This prevents scratching one disc with another, and makes it easier to find the one you want. Store them standing on edge in racks or on a shelf and be sure no dust can get to them. Shelves close to the floor are bad for dust unless they are enclosed. Don't store records near a radiator.

If your turntable is velvet covered, brush out the accumulated dust with a good clothes brush or vacuum cleaner from time to time. Make it a habit to keep the lid on the machine closed when not in use. This keeps dust off the turntable. If there is no lid use a cloth cover.

See that the pick-up arm moves freely. If your pick-up is heavy, don't worry too much; you can still get hundreds of good playings from your records if you use a good playback point. With lighter pick-ups the record life will be even longer. If your pick-up does not have a permanent point, always use a new shadowgraphed needle when you play the first lacquer disc. After that, as long as you are playing lacquer discs, the steel needle will be good for about 30 mins. playing time, but if you play even one pressing, then change to a new needle before playing another lacquer disc.

Many people like to use sapphire playback points. They give good results and save the worry about needle changing. However, if you use a sapphire playback, and play a lot of pressings, keep in mind that in time pressings will wear away the sapphire, sometimes leaving sharp edges which could damage the lacquer grooves. Be on guard for a graying of the grooves or an accumulation of powder on the tip of the needle. Careful broadcast engineers who use pick-ups with permanent sapphire points never play lacquers with the same pick-up they use for pressings. This is because the pressings are likely to damage the sapphire stylus and the damaged stylus would not fit the grooves properly.

When finger marks, dust, heavy needle pressures and damaged styli are avoided, it is amazing how a lacquer disc will stand up after many repeated playings. A little attention to these points will pay dividends—you can enjoy your records and have them too.

PLAYBACK SYSTEMS for DUBBING

By Harold J. McCambridge
Supervisor of Audio Maintenance & Construction, WHOM—New York

(This is the sixth in a series of articles by leading figures in the recording field.)

Every recording engineer in an active broadcast or recording studio daily faces the problem of making "dubbed" or re-recorded discs that sound "as good as, or better than" the original. This is a task that requires all the techniques of making an original recording (with the exception of microphone handling), plus a number of new ones that spring up when the playback system is brought into the recording line.

Harold McCambridge

Dubbing is now used so extensively in the production of commercial records that it can be considered a regular part of the production process in most of the industry. In a broadcast studio its principal uses are as follows:

1. Preparation of transcribed program material; using recorded music from various sources for background or primary material.

2. Assembly of interview-type material from spot recordings made at the convenience of the participants.

3. Furnishing to clients and artists of permanent records of program material by production of copies from the original program transcription.

Obviously it is necessary to have good recording equipment in order to make a good dubbing. What is often overlooked is that dubbing imposes very strict requirements on the playback system. From the point of view of the broadcast engineer, the most essential characteristics of a playback system for dubbing are the following:

1. Harmonic distortion and, especially, **intermodulation distortion,** must be at extremely low levels in every part of the playback system, including the pick-up, equalizer, and pre'amplifier. A distortion level that may be tolerable in the reproduction of records can be quite unallowable in a playback system used for dubbing. The final product suffers from the distortion of three main sources added together: the original record, the playback system, and the recording sys-

(Continued on Page 4)

"The smallest of the small." That's how many people have sized up Mr. J. T. Martin's Hollywood Recording Studio in Los Angeles. And, from the picture above, most of us will agree with that description.

"Space Isn't Everything In Recording" Proves Proprietor of California's Smallest Studio

What is probably one of the smallest recording studios in the world, if not the smallest, is located at 350 North Main Street in downtown Los Angeles. Owned and operated by Mr. J. T. Martin, this smallest of small studios, known as the Hollywood Recording Studio, is the home of the Hollywood Recording and Music Publishers.

Measuring 9' x 9' overall, Mr. Martin's workshop, strange as it may seem, is divided into individual rooms; the control room and business office, occupying a 6' x 9' portion of the precious space, and the actual recording room, operating in an area only 3' x 9' . . . hardly room for half 'n elbow.

Although small in structure, it has never been said, that the Hollywood Recording Studio is a small time proposition. No siree, for all the latest, up-to-the-minute recording devices are in the 9' x 9' square.

Let's look inside Mr. Martin's haven and see what all he has packed into this king-size Corona-Corona receptacle. First of all, the recording room is equipped with 2 crystal microphones and a studio type bi-directional mike. There is also a loud speaker in this room allowing for a private playback of a finished recording. Sometimes the loud speaker is used to carry (recorded) music from the control room to the microphones. This music is used for background for certain types of musical recordings. In the control room, we see 2 Radiotones, 1 Federal, 1 Wilcox Gay; two of these being 16" turntables. Three loud speakers are in use. Over in one corner is a small assorted file of commercial records and a business desk. Somewhere (only heaven knows . . . just where) Mr. Martin finds space for the stock of blank discs. Where do the customers stand or sit? Well, if the number of patrons exceed the space, Mr. Martin ushers them outside and they transact their business through the structure's large windows.

Hollywood Recording Studio is the third stage in Mr. Martin's rapidly growing business. Only three years ago he entered the recording field with only one 12" turntable recorder and a booth hardly big enough to hold him, the machines, a microphone and one customer. What's more, two months later he bought another machine and moved everything, lock-stock-and-barrel, into more spacious quarters; this time a 5' x 8' emporium. And, then, after 6 months, as is always the case, there comes a time when a fellow just needs more room. So, Mr. Martin, realizing the necessity for additional space, and a great believer in the theory that good things come in small packages, shifted his belongings to his present site.

Andre Baruch, noted announcer and his singer-wife Bea Wain utilize original recording techniques which give their "Mr. & Mrs. Music" show (top recordings, pre-releases and interviews with disc stars), an up-to-the-minute live quality. The program is heard daily over WMCA-New York.

Playback Systems For Dubbing

(Continued from Page 3)

tem. The playback distortion, therefore, does not stand alone as in the reproduction of records but has a cumulative effect with that of the other elements in the dubbing system. Unless the playback system distortion is rigidly controlled the result will be a transcription with high intermodulation distortion. This is a vital matter to a broadcast engineer since an increase in intermodulation distortion is soon reflected in loss of "ear acceptability" and listener approval.

2. The pickup used must cause negligible record wear, since it is often necessary to play "acetate" records many times in preparing transcribed material. An increase in surface noise or a loss of definition between the first and last playings of an original acetate are highly inconvenient, to say the least. Low record wear means, in general, that the pickup used must have high mechanical compliance, both horizontal and vertical, with the accompanying low stylus pressure. One incidental advantage of using a pickup of highly refined moving system is that it makes possible "spot cueing" on records used for program material or dubbing, without ruining the records. A heavier pickup, "spotted" on a still record which is put in motion at the proper cue, will produce a minute depression in the record surface which is heard as a "tick" the next time the record is played. Records which have been spot-cued a number of times develop so many ticks that they are unplayable. A truly low-wear pickup does not produce an audible depression in the record surface.

3. The adjustable equalizer system, necessary in every modern broadcast studio playback system, must introduce no distortion, as mentioned above, and in addition, must be stable in its characteristics and accurately calibrated. To achieve such an equalizer set-up, beginning with a pickup which itself must be equalized to produce a flat "starting" characteristic, is difficult if not impossible. By the time two or more of the commoner varieties of equalizer have been piled on top of each other, calibration is easily lost, and more important, a high level of distortion has been added to the system. These difficulties can be avoided by starting with a pickup which is inherently flat, and adding an equalizer system which has been carefully designed as a single unit, to operate with the particular pickup chosen. A pickup with a basic flat characteristic is highly desirable, of course, for other reasons: it produces less surface noise, and is free of the distortion characteristic of transducers which have serious peaks within the operating range, a distortion which is not removed by electrical equalization of the peaks.

A satisfactory solution of the pickup problem at WHOM was finally reached after we had tested several commercial pickups. It was found that the Pickering Pickup and Equalizer for lateral playback, and the Western Electric Pickup and Equalizer for vertical playback, gave us all of the necessary dubbing characteristics.

Other dubbing problems could be discussed but it is believed that the ones outlined are those that need the most emphasis from the point of view of the broadcast engineer.

New NBC Auditioning Procedure Fresh Hope For Radio Aspirants

(Continued from Page 1)

filed, and directors seeking a certain type of voice or character for some later production can run through a card file, get the disc for a re-play, and choose the particular type his show needs.

Before actors and actresses finally go before the mike for their recording of a program, they are interviewed and "screened" by Edward King, NBC's director of dramatic auditions. King talks to his callers, reviews their previous experience in radio, Broadway shows, summer stock or college dramatics.

Each is told that only the best talent will go on the air, yet every help is given youngsters who hope to make radio their career.

After the screening, they are told to stand by for calls, and when a director takes his turn for the week's production, he studies the card files and five-minute records made of applicants' voices on "mad, sad and glad" readings. A cast is drawn to fit the script, calls are made, and the show is on its way to the disc.

"These records are among our most valuable files, and as the Actor's Audition Showcase goes on, they will become increasingly important in our casting," Mr. Adams said.

Bob Hille, quizmaster of KXOK—St. Louis' popular recorded program "Food Store Quiz," interviews a group of shoppers in one of the Missouri city's busy food centers. Hille conducts the novel feature on Thursday and Friday of each week from three food stores in the St. Louis area. As the programs are not broadcast until Monday, Wednesday and Friday of the following week, quiz participants are able to hear themselves. Sponsored by a local coffee manufacturer, "Food Store Quiz" gives a cash award to shoppers who answer questions correctly; to those who fail, a pound of coffee. Questions for the quiz are contributed by the radio audience; special prizes going to contributors of questions used.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3 No. 4 | 444 Madison Ave., N. Y. C. | April, 1947

Audio Devices' President In Europe; To Confer With Top Phono-Radio Heads

"1946 Record Sales Only Beginning; Foreign Disc Demands Up Too"—Speed

William C. Speed, President of Audio Devices, Inc., sailed recently on the QUEEN ELIZABETH for Europe, where he is scheduled to meet with leading recording and broadcasting officials in England and France on market conditions and technical advancements in sound recording.

William C. Speed

Prior to his departure, Mr. Speed related that, although 1946 witnessed the manufacture of more than 300,000,000 phonograph records, plus countless thousands of other types of transcribed recordings, the year 1947 promises even greater record production.

"We in the recording industry," Mr. Speed emphasized, "definitely believe that the popularity phonograph records and recorded radio programs enjoyed during the past year is only the beginning of a trend that will soon see more and more people enjoying recorded entertainment in their homes.

"Phonograph record production and sales alone last year," Mr. Speed pointed out, "were three times as great as before the war. This has occurred," he said, "in spite of the fact that comparatively few new phonograph machines have yet been produced. And, this large increase," Mr. Speed continued, "is not only seen in this country, but abroad as well. Exports of recording discs have increased rapidly and now amount to more than 10% of domestic sales. The production of electrical transcriptions, the more expensive and better quality record, primarily used for transcribed radio programs, was also far greater than in previous years," Mr. Speed explained. Prior to 1941, this type of record was used almost entirely for musical programs.

(Continued on Page 2)

Occupying an attractive corner in Larry Ruddell's living room (Larry is ABC's disc chief) is this amplifier rack, which contains 6 channels of recording equipment and the master control board. Other units in the room, pictured clockwise: New Garrard RC-60 record changer atop a 16" record file cabinet; Match ply-wood cabinets housing test equipment and recording lathes; Incompleted power supply and tuner rack; Inside view of recording tables, which includes equalizers, transfer keys, VI meters, etc.

"Recording Is My Avocation and Vocation Too" Says American Broadcasting's Recording Chief

By Larry A. Ruddell
Recording Supervisor
AMERICAN BROADCASTING COMPANY

Ever since the day my father brought home our first "gramaphone" many years ago and said you can make music if you turn the crank and push the switch, I have been interested in making music played by other people sound good.

Since those days many changes have taken place not only in the art of recording but also in reproducing, and during this interim I have tried many ways and have had many disappointments in my quest for **perfect recording and playback.** Actually the nearer I have thought I was to this goal the further away I have been from it. Recently, in my attempts to **learn why,** I have become surrounded in my every day life by what is actually a laboratory, consisting of the latest equipment developed in the industry.

The accompanying pictures will show in part the equipment I have, and I will

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Oh, Yes He Was!

A contestant on Mutual's "Double or Nothing" a few Sunday nights ago was asked: "Was Enrico Caruso one of the greatest voices ever to be heard over the radio?" Promptly came the answer: "Yes." Todd Russell, program arbiter, just as promptly said: "No." Unabashed the guest retorted: "But I heard him over the air only two weeks ago!" The contestant explained it was a recording. Russell paid off!

audio record

VOL. 3, NO. 4 APRIL, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Audio President In Europe

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Since that time, however, the use of completely transcribed shows has increased each year until today recorded programs are being presented approximately half of the total time radio stations are on the air.

In addition to foreseeing an unprecedented output in phonograph records and electrical transcriptions, the Audio official also explained that the demand for the instantaneous disc is now more than four-fold pre-war and with the construction of many new radio stations, coupled with the stepped-up manufacture of recording machines, the 1947 demand will reach even greater proportions.

When questioned on the practicability of other types of recording devices, such as wire and tape, and the '47 production outlook for them, Mr. Speed answered by saying: "It is our feeling in the recording industry that in the not too distant future delayed broadcasts, original motion picture recording, and conference recording will surely take advantage of some of the features offered by these other devices, particularly iron oxide coated vinyl tape. This method of recording, which was brought to a high degree of perfection by the Germans during the war, is now well along the road to mass production here. In fact, our own company has done considerable research on vinyl tape during the past year and production is now under way. However, he concluded, "any effort to indicate that discs and oxide tape, for instance, are competitive seems rather futile at this time. Discs are still high on the wave of popularity with every indication of staying there if simplicity, quality and price are to remain as governing factors."

Mr. Speed will remain in Europe for approximately one month.

"SCHOOL SOUND SYSTEMS"

A splendid guide for those selecting and utilizing sound equipment, **School Sound Systems**, a comprehensive 31-page summary of basic standards for school sound systems, is being offered (single copies free) to educators and others working in the field of Audio education by the Radio Manufacturers Association, Washington, D. C.

ABC Disc Chief Home Recordist

(Continued from Page 1)

try and describe to the reader what my "home recording unit" consists of.

The first thing I had to do was to sell my wife on the necessity of having it and to reconcile the investment that was necessary for the installation. Since this was to be a "proving ground" for my ideas it was essential that I have the tools with which to work, so I proceeded by "trial and error" to obtain the finest speakers, amplifiers, cutters and other components necessary for the construction of a recording and sound system.

I utilize practically every controversial component that is discussed in the trade today; triode and pentode amplifiers, commercial, custom built and equipment of my own design. Communication receivers, TRF and Superhet tuners, Jensen and Altec speakers, special recording equalizers, etc.

We all know that before we can hope to cut a good "platter" we have to be sure we have a good recording table, cutter and blank on which to record. If we haven't these basic requisites, regardless of what else we have, we cannot hope to obtain the desired result.

For recording I use Allied tables. I have mounted these on twenty-four inch base panels and together with a few other "tricks" the records are free from any visible pattern and there is no discernible "rumble" on playback. For appearance sake, the overheads have been chrome-plated and the base plates are stainless steel. The control panels are mounted on bakelite and chrome trimmed. The tables are lighted with overhead lumaline fixtures.

I have tried all cutters that are interchangeable with my overheads including RCA, Fairchild, Presto and others but of all these I prefer the new Presto 1D.

Due to lack of space, the rack consists of 60 R-T-S jacks and the main cable from the recording table to the rack contains 50 pair of shielded leads and 10 additional pair run up from the auxiliary block in the power supply cabinet. It also contains 6 channels of equipment. Two of the amplifiers use 6B4's, one 807's, one 6L6's and two 6V6's in the output. I use the new Super-Pro 400X for communication work, the Hallicrafter S36 for UHF work from 27.5 to 143 megacycle and for comparative FM tests, a Miller TRF tuner, the new AM-FM Browning and last but not least the new deluxe Fisher.

Also in the rack there are two four-channel Pre-amps that are interchangeable with any of the above equipment

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disc-data for the Recordist

By C. J. LeBel, Vice President AUDIO DEVICES, Inc.

W O W

In the midst of the current widespread interest in improved recording fidelity, one factor has received little notice, the question of stability of speed, or wow. This is the more curious because the public is quite conscious of such a fault.

C. J. LeBel

Everyone, of course, appreciates the need for watching the condition of the drive mechanism of a recording machine and playback table. On the other hand, few seem to remember the role of excessive clearance between center pin and disc hole. The result can be serious, regardless of the quality of the machine. In fact, a very fine pre-war machine can be the most erratic offender, due to pin wear from the many discs recorded or played.

The Problem

To simplify this discussion, we disregard the spiral nature of the groove and consider the needle running at a fixed distance from the center of the disc. We ignore also whether we are recording or reproducing—a disc miscentered in recording and played back centered will exhibit the same wow as a transcription disc perfectly centered in recording, and miscentered in playback. We likewise neglect the distortion products resulting from the frequency modulation process (which wow is), and take only the maximum range of pitch change. This figure has been the one generally discussed, being most easily measured.

Calculation

If a disc with a hole larger than the center pin is placed with one edge of the hole against the pin (as usually happens in a busy recording room), the disc center is offset from the center of rotation by half the difference of hole and pin diameters, which we may call $\frac{d}{2}$.

This means that the distance from the groove to the center will change, during

one revolution of the disc, from

$$R - \frac{d}{2}$$

to

$$R + \frac{d}{2}$$

where R is the distance from the center of rotation to the groove spot which is being played.

Obviously, the proportional change in groove velocity as a result of the change in radius will be

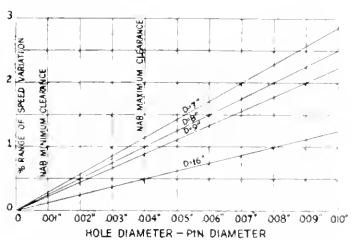
$$\frac{R + \frac{d}{2}}{R - \frac{d}{2}} - 1$$

In terms of diameter ($D = 2R$) this becomes

$$\frac{D + d}{D - d} - 1$$

In the range of variation we are considering, where d is very small compared to D, this expression may be very accurately simplified to change in groove velocity $= \frac{2d}{D}$

This may easily be read in the following figure:



Of course, if this wow occurs in recording, and if the reproducing pin is the same size, the wow by fortuitous placement on the pin may be doubled, unchanged, or reduced to zero in reproduction.

Some Practical Observations

Obviously, some variation in disc hole size must be allowed, to allow for a reasonable amount of wear of punch and die. Also, some variation of pin size is necessary. On the other hand, the number of professional machines is limited, whereas the discs are made by the million. Hence, it is most economical to allow a larger share of the permissible variation for the disc hole.

In March 1942, the National Association of Broadcasters set the following dimensions as standard:

Disc hole .285 to .287″ diameter
Pin hole .283 to .284″ diameter

(Continued on Page 4)

U. S. Savings Bond radio promotion for 1947 gets underway as Kenny Delmar (radio's Senator Claghorn) and Gladys Swarthout, lovely singing star, present one of the first discs of the new "Guest Star" series to Wm. A. Kielmann, Vice President of the New York State Bankers Ass'n.

Over Eleven Hundred Stations Sign-Up To Air Treasury Department's "Guest Star" Records

With America's radio stations leading the way in promotion, the U. S. Treasury Department chalked up a grand total of well over eight billion dollars' worth of Savings Bonds sales during 1946. And, transcriptions were the most important and widely-used medium of Savings Bonds radio promotion. When the "Treasury Salute" (fifteen minutes, twice each week) transcribed series completed its run the latter part of December, it was being broadcast by one thousand and four stations—probably the greatest number of stations in radio history ever to carry a program for an extended period.

In addition to "Treasury Salute," the Radio Section of the Savings Bonds Division produced during 1946 thirty-six five-minute transcriptions featuring famous athletes and prominent women. These discs were done with an interview format, but only the interviewee's voice was cut on the record. Carefully timed pauses were spaced between answers, so that local station sportscasters and women commentators could ask the questions from scripts which were provided with the transcriptions. This production twist added a novel, local flavor to the programs and garnered for them wide and enthusiastic acceptance. Approximately seven hundred stations presented these five-minute interview transcriptions.

Savings Bonds transcription production for 1947 is well under way with this year's fifteen-minute feature being "Guest Star," a variety program starring many of today's outstanding radio artists.

In addition to one or two top-name guests, each "Guest Star" program features as "host," Kenny Delmar, plus music by the Savings Bonds Orchestra and Singers under the direction of Denes Agay. All of the shows feature original material prepared especially for the Treasury by writers Carroll Moore, Jr., Mort Freedman and Milt Surrey.

Eleven hundred and twelve stations have placed written requests with the Savings Bonds Division for the "Guest Star" transcriptions. Program number one was released for broadcast March 30th. The entire series will be accompanied by high-level promotion to build the largest possible listening audience.

Not only during the war, but even more so during the first peacetime year of Savings Bonds activity, has transcribed radio proved its value, so it's only logical that the Treasury will continue to base its Savings Bonds radio operation on transcriptions and the individual radio stations during 1947.

"The transcribed announcement scheduled for this period will not be heard."

ABC Disc Chief Home Recordist

(Continued from Page 2)

and which permit me to do all kinds of mixing; each one consists of two low-level and two high-level inputs.

I use the Western Electric 9A and 9B pickups for playback of hill-and-dale and lateral reproduction respectively. Each pickup has its own booster and pre-amp in its circuit.

There is a cutter-transfer key that makes it possible to cross-over from one cutter to the other through the same recording channel but by the use of cutter keys it is possible to record two different fifteen minute programs simultaneously.

As level indicators I use the Weston VU Meter on the control panel of the recording table and on the amplifier control rack I have a DB Meter calibrated with the one on the recording table for the presetting of recording levels. All of the recording amplifiers are flat from approximately 20 to 20,000 within plus or minus 2DB with about one-half of one percent distortion.

For the playback of commercial shellac records I use the new Garrard RC60 record changer with the new GE, MPLI crystal and the Garrard magnetic pickups that are all interchangeable. For recording I use discs from all of the "Big Four" manufacturers but for overall dependability and consistency it is the Audio Red-Label two to one.

My test equipment consists of a Hewlett-Packard Oscillator, RCA Oscillascope, Daven Gainset, Hewlett-Packard distortion meters, RCA Volt-Ohmyst tube tester, continuity meters and miscellaneous check records. It is possible by "throwing" a patch-cord in the rack to feed tone to any channel, to "meter" the output as well as put it on the scope by the same simple procedure. I have striven for simplicity of operation and design and interchangeability of all components of the system. All input and output impedances are 5000hms which greatly increases flexibility.

Always remember you cannot take out of a system more than you put in and if it is not **Clean** going in it will not be **Clean** coming out. The human ear is final criterion by which all reproduction is judged and if it is not pleasant listening your efforts for perfect reproduction have been in vain.

Disc-Data

(Continued from Page 3)

From the chart, these dimensions will permit a fluctuation **range,** at 7" diameter, of

Average	.07%
Maximum	.11%
Minimum	.03%

These are not normally noticeable. On the other hand, we have often encountered badly worn pins on otherwise good machines, a typical case being .280" With a .287" hole, this would produce a range of .2%, which may be noticeable when added to the natural wow of the machine.

Actually, the NAB limit of **range** of variation of recording machine speed is .2% (± .1%), so it is reasonable to keep other variations small by comparison.

Conclusion

Wow being such a variable, and so hard to track down, it is the better part of wisdom to minimize misfit as a cause. Many machines now in use have pins as small as .278". It would be wise to measure your own machines at intervals, and if the size is beyond official limits, consult the manufacturer. Do not use an oversize pin—a hole of lower limit size may fail to fit on. With many tables in use for nine or ten years, this matter deserves real attention.

Attention Readers

If YOUR name is not on the Audio Record mailing list, drop a penny post card to—The Editor, Audio Record, 444 Madison Avenue, New York 22, N. Y.

The 1947 National Convention and Show of the Institute of Radio Engineers, held March 3-6 in New York's Grand Central Palace and Hotel Commodore, saw the registration of 12,500 persons and was unquestionably the most successful event in the Institute's history, IRE officials advise. During the four day meeting, 120 technical papers were presented, several of which concerned latest developments in the recording field, and 170 exhibitors from every state in the union and from every province of Canada displayed their products. The Audio Devices display (above) showed the various types of discs, their applications, and each step necessary in their production, from raw material to finished blank. Also, the process involved in making phonograph records from Master discs. On the booth's sidewalls, transcription labels, representing hundreds of radio stations and recording studios throughout the United States, Canada, Alaska, Porto Rico and Hawaii using Audiodiscs, were displayed.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3, No. 5 | 444 Madison Ave., N. Y. C. | May, 1947

Many Recorded Programs Being Aired By Europe's Few Commercial Stations

Discs Cut Here For Foreign Playback

European commercial radio completely inoperative during the War with the exception of some forty low-powered stations in Spain and a high-powered (60,000 watt) privately owned station in the tiny republic of Andorra, perched high atop the Pyrenees, has now returned to normal peacetime operations. "Radio Andorra" operated commercially throughout the entire War.

The "Speakerina," Europe's famous disc jockey of Radio Andorra, who broadcasts continuous music from twelve noon until 1 A. M. each day.

After the cessation of hostilities, stations which operated commercially before the war in France were not reissued their permits to operate commercially. These stations were confiscated by the Germans at the time of the Occupation and after the Liberation were taken over by the French Provisional Government. The Government still controls them and has shown no indication that they will return them to their former owners to be operated commercially.

Today, the only radio stations operating commercially in Europe are the twenty-six stations of the Italian Network; the forty outlets in Spain; the aforementioned Radio Andorra; Radio Monte Carlo in Monaco and Radio Luxembourg. And, as is true with most stations in America today, all are making considerable use of transcribed programs in their daily schedules. The Italian network, for instance, has recently acquired an NBC Thesaurus library to supplement other recorded programs being aired to affiliates. And then too, CETRA, a subsidiary of the Broadcast-

(Continued on Page 2)

Paul J. Miller, assistant managing director of WWVA-Wheeling, W. Va, interviews two members of the crew of the LST 753 on the transcribed broadcast of the "Incentive Inspection" of the ship by employees of the Blaw-Knox Company of Martins Ferry, Ohio. Edwin L. Keim, WWVA's chief engineer, is shown at the controls of the recording equipment.

Cutting Discs Aboard Navy LST While Underway
Unusual Experience of WWVA Recording Staff

(Recently, the editors of Audio Record asked the studio engineers of several 50,000 watt stations to write a brief account of the circumstances surrounding "the most interesting recording" they had ever made. Many replies were received, but it is believed that the experiences (related below) of Edwin L. Keim, Chief Engineer, WWVA-Wheeling, W. Va. and his staff were among the most interesting and most unusual.)

It was during the summer of 1945 that the recording staff of WWVA was given possibly its most interesting and unusual assignment. After months of planning, obtaining authorizations from the Secretary of the Navy on down, plus countless miles of other red tape, the Blaw-Knox Company of Martins Ferry, Ohio (wartime manufacturers of 40mm anti-aircraft gun mounts) succeeded in arranging a stop-over of a few hours for one of the Navy's LST's (landing ship-tanks), enroute down the Ohio River to New Orleans, for an "Incentive Inspection." The plan was to permit Blaw-Knox employees to board the vessel and inspect the gun mounts of the famous "fightin' forties" that they themselves were building. Object, of course, was to increase their interest in production. In connec-

(Continued on Page 3)

In The Flesh—No Less

A few Sunday nights ago on the Jack Benny stanza, four of radio's top-flight warblers occupied the guest slot Dick Haymes, Andy Russell, Dennis Day and the incomparable Crosby. While the others were building up a dramatic entrance, Bing sidled in, and, seeing that Benny's expression registered surprise, and being a fellow who can grasp such a situation, der Bingle said a la Fred Allen's Mrs. Nussbaum: "You are expecting a transcription, maybe?"

audio record

VOL. 3, NO. 5 MAY, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Transcribed Shows Or Participation?

By Charles J. Basch, Jr., President
BASCH RADIO PRODUCTIONS
New York, N. Y.

"I'm using a woman's participating program," an account executive said to me a few years back, "and I'm getting fair results. For the same amount of money, what else is there that will do a better selling job?" "Something that will give your client 'sponsor identification', which he isn't getting on the participating program," was my reply.

Chas. J. Basch, Jr.

The reasoning behind purchasing a spot on a participating program is that a woman commentator or other artist enjoys a certain following and a 'rating'. The hope is to try to hook in on this 'rating'. We believe this reasoning to be erroneous, and it has been proven dozens of times. You don't necessarily 'hook in' on a rating. You merely get a spot announcement on a program. There is no 'sponsor identification' attached to that. A case in point:

Better Proof Than Hoped For

An agency man told me that he had just bought a spot on a well-known New York participation show for one of his clients because it had a good rating, was musical, and as the women in his home did not like soap operas, they listened to this program continually.

The women turned out to be his wife, a nurse, and a maid. I told him that I thought they listened to the program and recognized it as the show featuring 'Joe Doakes', but that I did not believe they knew too much about the spot announcements or participations the program contained. He disagreed. So, we called the station and found that there were ten participating sponsors on the show. Inquiry disclosed that the women were able

(Continued on Page 6)

European Stations Air Disc Shows

(Continued from Page 1)

ing Company SIPRA, has made some excellent recordings of the best Italian opera singers. An album of Ferruccio Tagliavini made by this company is now on sale in New York City.

Radio Andorra, because of its geographic location, has practically no live talent and therefore makes constant use of recordings of every kind. As a matter of fact, this station carries on a continuous disc jockey show from twelve noon to 1 a. m., the disc jockey being a very pretty girl called "The Speakerina". Her trade mark, "Aqui Radio Andorra", is known from Gibraltar to the English Channel. This is the only station in Europe providing a continuous program of light popular music.

With a desire to sell their products in the European market, American sponsors are making recordings of their commercial programs here in America for use on the Italian network. A recent example of this was the series of singing commercials made by Elsa Miranda, the "Chicquita Banana" girl, for Royal Baking Powder, a product of Standard Brands, Inc.

The Government radio of all European countries carried on extensive experiments with recording during the war and today commercial radio is now picking up where Government radio left off. Thus, continuous and increasing use of recordings over the commercial radio stations of Europe is a certainty.

ABC Net Places Daylight Saving Plan In Operation

On April 27, the American Broadcasting Company placed in effect its Daylight Saving Time plan of operations initiated last year and which, through use of special lines and recordings, maintains all its programs in all time zones at the same time the year around.

Operating only during the 22 weeks of Daylight Saving Time, the plan this year will encompass ABC's entire program schedule.

Basic mechanics of this operation developed by ABC involves special broadcast lines and recordings. Through the use of these special lines, programs will be broadcast live to ABC stations operating on Daylight Saving Time and recorded in Chicago and Hollywood for rebroadcast one hour later for stations operating on Standard Time.

A similar system used on most of ABC's program schedule and on most of the stations last year during Daylight Saving Time was found to be mechanically perfect when 1,848 hours of continuous recording in Chicago alone resulted in the loss of only five minutes—and that through a power failure.

Parts Show To Be Held In Chicago This Month

The 1947 Radio Parts and Electronic Equipment Conference and Show is scheduled for May 12th through May 16th at the Stevens Hotel in Chicago. Audio Devices will display its products in Booth 148.

WWVA Crew Records Aboard LST

(Continued from Page 1)

tion with the occasion, arrangements were made for a few officials of Blaw-Knox and press and radio representatives to board the ship at Steubenville, Ohio and travel with it to the point where the special dock for the Incentive Inspection had been built, near Martins Ferry.

WWVA attempted to arrange a broadcast of description and interviews to completely cover the proceedings. Naval authorities in charge turned "thumbs down" on a plan to use the station's Mobile Relay Unit aboard the ship. Permission to use the vessel's radio transmitters was also refused. However, it was finally suggested that a portable recorder be used so that naval personnel could check material before released. This plan was followed and the recording equipment was taken aboard at Steubenville where the LST had to be locked through one of the numerous control locks on the Ohio River.

Almost immediately after boarding the ship, it was discovered that the only "AC" available was an auxiliary supply unit used on the gun turrets. The ship's electrician advised that the frequency might be unstable. So then, the recorder was set-up on an ammunition box just ahead of the pilot house. Some trouble was experienced with vibration from the diesels when the ship was underway but this was controlled by putting a couple of Navy blankets under the recorder, which later proved a good idea because the discs cut were acceptable for broadcast purposes.

Prior to the ship's arrival at the Blaw-Knox dock where the WWVA "shore" crew took over with their Mobile Relay Unit, several interviews with various officials and ship's personnel were recorded. The MRU piped the balance of the broadcast to the master control room in Wheeling where it was routed to recording. A couple of hours later, after considerable editing, the show was on the air. The officers and crew of the LST, by this time several miles south of Wheeling on their journey to the coast, heard the program aboard ship.

This incident is of particular interest since it is believed that it was the first broadcast ever attempted from a naval vessel in war time, while underway, hundreds of miles from any ocean.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

RECORDING LACQUER

Lacquer forms the coating for all modern instantaneous recording discs, and since the groove is cut directly in it, the character of the coating is the character of the blank. This article answers many questions which have come to us from time to time, and so may give the professional recordist a better understanding of the material which he handles. Needless to say, a recording lacquer does not consist of a highly filtered mixture of ordinary commercial black automobile lacquer with two drops of decibel juice added to each gallon.

C. J. LeBel

Virtually any lacquer made includes most, if not all, of the following classes of constituents:

Film Former

The film forming material around which the entire formula revolves may be any one of the following: nitro-cellulose, ethyl-cellulose, acetyl-cellulose, or vinyl chloride. All of these are available in many types and "viscosities." Complete tests leave no doubt that nitro-cellulose is by far the best as regards all professional recording qualities. Of the others, ethyl-cellulose has been utilized in some amateur home recording discs, but the results are certainly not professionally usable.

Solvents

The film forming material as received from its manufacturer is quite unfitted for direct coating; in fact, cannot even be applied as a film without being dissolved in a solvent, of which we have our choice of three different groups (classified by boiling point).

Low boiling solvents will evaporate very rapidly even at room temperature Representative materials in this class are: acetone, ethyl-acetate, methyl-acetate, alcohol, methyl-ethyl-ketone, and scores of others.

Medium boilers evaporate rather slowly at room temperature, but evaporate rapidly at a slightly elevated temperature.

Finally, we have high boilers which evaporate very slowly indeed at an elevated temperature. In fact, it may be rather desirable to heat for twenty to one hundred hours to drive them out completely.

It is very difficult to make a satisfactory lacquer using only one of these solvents, so the chemist prefers to use two and often all three groups. Correct selection of solvents will greatly help production reliability.

Resin

Occasionally, a chemist will wish to add a resin or other similar material to give the coating some body. This will give the coating more strength, but the desirability of its use is perhaps questionable. For the chemist who insists on using such a material, there are a very large number of resins, such as the copal, dammar, mastic, shellac, and the phenolic and alkyd groups.

Diluent

To dissolve the resin or to change the evaporating properties of the solvent mixture, a diluent is very often added. Diluents do not absorb moisture and, therefore, are very well behaved in summertime, whereas some solvents previously mentioned may absorb some moisture, and this has to be driven out in the processing. On the other hand, a diluent by itself will not dissolve the film forming material, and only a limited amount of it may be used, for the limited compatibility of diluents with solvents sets a definite maximum. Representative diluents are: benzol, toluol, and naphtha.

Plasticizers

We come now to the most important materials of all, the plasticizers. Lacking them, we would find a coating which was extremely hard, extremely brittle, extremely noisy, and violently inflammable when it had dried. To prevent this, materials are added which should remain in the coating throughout life. Properly chosen, they soften the coating, make it easy to cut and quiet in playback*. Two types of plasticizers are available: the solvent type and the non-solvent type. Solvent plasticizers actually are solvents of extraordinarily high boiling point, so high that they very often will decompose before they will boil at atmospheric pressure. Representative materials of this sort are: dibutyl phthalate, dioctyl phthalate, triacatin, dibutyl sebacate.

Non-solvent plasticizers will not dissolve the base material, but are compatible with it. They have many excellent properties, and the only thing that limits their use is the fact that an excess will tend to sweat out under adverse conditions. It is, therefore, necessary to use a mixture of solvent and non-solvent plasticizers. Castor oil is one of the most common non-solvent plasticizers.

Dye

A black dye is usually added to a lacquer in order to improve its appearance and make it easier for the recordist to judge depth and smoothness of grooves. There are only two very simple requirements for the dye. It must be extremely dark in color, and it must be readily soluble in the solvent. There are a very large number of dyes available, all answering this description, and dye selection is perhaps the easiest problem of the entire formulation.

The Formulating Problem

Because Audio Devices has its own lacquer plant, the composition of the material is entirely under our own control.

An ordinary industrial finishing lacquer may contain six or seven constituents; adequate formulae may be found in many reference books and the chief limit is the cost of materials. Half of the job of an industrial lacquer chemist is the developing of the use of extenders to cheapen the material without injuring its properties, and most of the other half of this job is that of improving the quality without significantly increasing the material cost.

Recording lacquer is quite another affair. It will contain approximately thirty constituents, some of which are present to the extent only of .05% and the formulae are entirely secret. We have never seen a single recording lacquer formula published, and the most important plasticizer constituents could not be detected with accuracy by the best analyst. The magnitude of the formulating problem may be best appreciated when we realize that it is an art as much as a science and that it is basically exeprimental in nature. The chemist must try a large number of proportions of each material with a large number of alternate proportions of each other material. We may appreciate this problem the better when we realize that fifteen materials each tested in ten different proportions will mean 15^{10} tests to be made. This obviously completely impossible regardless of how many men are brought to bear on the problem. We rely very heavily then on the genius of our formulators and, as they feel their way along in the developments, they are able to eliminate a large number of the tests as obviously unnecessary.

Plasticizer Choice

As was mentioned previously, plasticizers are extraordinarily non-volatile materials which are used to stabilize the coating and give easy cutting, long playback life, and low flammability. There have been two schools for formulation thought. American formulation in the American beginning period 1934-1938 used very little plasticizer; the coating was made soft by leaving a considerable amount of residual solvent. The discs were stored in a solvent tight can to retain this residual solvent. When the disc was removed from its can and left in the air, the solvent would evaporate and the coating would slowly harden. Typical playback life for such a coating was ten to twenty playings; the noise level was high and the stability of the coating was extremely poor. Nitro-cellulose with inadequate plasticizer is not a remarkably stable material, so the groove would warp appreciably with time, and the distortion increase would be very great. We have observed a harmonic distortion increase as great as 10% to 20% within a period as short as two weeks in testing discs of this sort.

The second school of thought began with La Societe des Vernis Pyrolac of Paris in the period from 1929 to 1935. In 1938 Audio Devices entered into a contract with Pyrolac whereby AUDIO-DISCS are manufactured in the U.S.A. under an exclusive license agreement. This contract also gave all the lacquer formulation "know-how" developed by Pyrolac since 1929. Our company is thus the only American company whose experience goes back so far.

Audio Devices' success with this type of recording lacquer from 1938 on forced a change in American practice, virtually completed by 1941. Pyrolac had found that a very quiet and durable coating could be made by using adequate plasticizers of the correct proportions, and the object of their formulator was to create a coating which would have no change in character throughout life. Properly done, such a coating will have a playback life ranging from several hundred to several thousand times, 20 db lower noise level, and negligible distortion throughout life.

Plasticizers may evaporate, oxidize, or polymerize, but because recording lacquer coatings are so sensitive, good record plasticizers will not exhibit any such changes. Ordinary industrial-lacquer data are wholly inadequate to the record-lacquer formulator's needs, for industrial lacquers can lose 50% of their plasticizing with little visible effect. 2% in recording disc plasticizing would be extremely bad. Audio Devices, Inc., is thus very fortunate in that its license agreement with La Societe des Vernis Pyrolac gives it access to recording lacquer tests begun as far back as 1929 and to their experience in manufacturing discs going back as far as 1932. Thanks to this extensive library of test data, our chemists have found the long life stipulation imposes no restriction whatever on the formulator's results. They were able to get quite as good performance in the long life disc as they could get if they were willing to take short cuts and use impermanent materials. It should also be pointed out that proper plasticizers exert a very profound stabilizing effect on nitro-cellulose and that such a coating is, therefore, of longer life than we can now estimate. Pieces of plasticized nitro-cellulose made in 1866 are still in existence. Research goes on continually with noticeable results and high promise for improvements in the near future.

Personality

Every experienced recordist will testify that a given lacquer formula has a very definite personality. Some of them are treacherous, ill-mannered and prone to cause trouble, while others are always reliable. Personality is perhaps the sum total of twelve factors. These may be listed as follows:

a. Easy cutting.

b. Static and thread throw.

c. Noise (as measured immediately after cutting).

d. High frequency response.

e. Playback life.

f. Aging of the uncut disc, loss of cutting qualities.

g. Aging of the cut disc, development of noise and inter-modulation distortion.

h. Adherence to aluminum under all climatic conditions.

i. Processing characteristics, good behavior in both the silvering and gold sputtering methods.

j. Stability of recording properties under a wide range of temperature and humidity.

k. Advance ball behavior.

l. Grease resistance.

Coating Process

Audio Devices introduced machine coating into this country and demonstrated that no other method equalled the single layer, homogeneous, automatic application of lacquer to an aluminum disc. When the film has dried, the disc is put through a controlled temperature cycle. This improves the coating considerably: the noise level decreases and the high frequency response improves greatly. Besides improving the coating, the temperature cycle has the important function of driving out the last remnants of the high boiling solvents. If left in, these would evaporate gradually over a period of weeks or months, and the hardness of the disc would be continually changing. When the controlled temperature cycle has been finished, the disc is punched with the standard 4-hole center, inspected and packed.

The Coating Machine

Eight years of experience have indicated that this automatic coating machine does not impose any restriction on the formulation; in short, any coating which makes a good record can be handled by this machine. Coatings made by other methods will be several db noiser than the same material applied by machine.

Quality Control

Of course, it is one thing to devise a good formulation, and it is another thing to manufacture it successfully. This problem has become more complex year by year and, with the present deterioration of raw material, it has even become necessary to re-purify a large number of chemicals. The impurities removed would have no significant effect on an ordinary industrial lacquer, and it is perhaps no reflection on the chemical manufacturers to say that re-purification is necessary. It has merely been found that microscopic percentages of certain impurities tend to effect considerable changes in the lacquer performance. Quality control is not a new phrase with us, as we were using advanced quality control procedures years before the war. Production control in the disc plant is a large subject in itself; it is chemical engineering par excelsis.

—

*. *High Frequency and Noise Level Characteristics of an Instantaneous Recording Disc — C. J. LeBel. ATE Journal, Vol. 8, No. 1, p. 6, January 1941.*

Reprints of This Article Available on Request

The Audio Record has been enlarged from four to six pages this month in order that we might bring our readers Mr. LeBel's complete article. Reprints are available to all who request them. Write—The Editor, Audio Record, 444 Madison Avenue, New York City.

The Television Transcription

By Will Baltin
Secretary-Treasurer
Television Broadcasters Association, Inc.

Although network facilities for television broadcasting are now being expanded across the nation, the television broadcaster will have to rely on "recorded" programs to a marked degree if he is to fulfill the requirements of the Federal Communications Commission, which initially called for a minimum 28-hours-per-week of telecasting beginning April 1.

Will Baltin

Networks can provide the television broadcaster in outlying regions with a certain amount of high quality programs, but for "local" shows, where sufficient talent is unavailable, he will have to fall back on transcribed or "recorded" material, much as the radio broadcaster does today.

The Disc Does The Work

Of course, in television there is a marked difference as to what constitutes a recorded show. In radio the disc jockey merely chortles his introductions—and the commercial—and then permits the disc to provide the entertainment.

Film is to television what the acetate disc is to radio. Quantitavely speaking, good film for television is scarce today. One can understand the reticence of the major film producer to supply television broadcasters with the product he makes available to theatres. A great hope for the telecaster lies in the independent film producer who is presently "packaging" film shorts, ranging from one to 30-minutes in duration.

New Film For Recording Tele

Intriguing projects are also understood to be under way in the laboratories of du Pont and Eastman Kodak where special film is being developed for recording television programs directly off the face of a cathode ray tube. With the picture quality on the fluoreseence of the kinescope constantly improving, and with the brilliance of the image easily controlled, it is quite possible to film an entire studio-produced television program off the face of the video receiving tube and thereby provide a method of not only retaining a permanent record of the production, but making possible distribution of the film for use on other stations.

(Continued on Page 6)

Grouped around a recorder as they listen to the playback of a disc are students in Elissa Landi's "Speech for Radio and Television" class at New York's City College. From left to right—Henry Dasaro, Miss Landi, Rose Kaufman, Mildred Cuscione and Sgt. W. P. Berkeley.

New York's City College Offers Speech Course To Radio-Tele Aspirants; Many Discs Employed

Because the use of recordings has proved to be one of the most valuable assets in attaining the goal of perfection in speech for radio and television, they are used extensively by Miss Elissa Landi, star of stage, screen and radio, in her classes in "Speech for Radio and Television," offered by the Evening and Extension Division, City College School of Business, New York City.

Records Aid In Speech Correction

Recordings used in the class are made from scripts read by all the students individually and in dramatic form. Later these records are played back to the student in individual conferences and in class. The defects in speech, inflection and diction are then discussed, in an effort to help the student overcome his speech faults and attain perfection. Miss Landi thus provides assistance for those who have imperfections in their speech which mar their speaking personality. Special attention is given to individual problems, both in class and in interviews between student and instructor.

Miss Landi's classes are held on Tuesday evenings in the studios of radio station WOR-New York. They are but a part of the many classes which comprise the radio and television offerings of the Evening and Extension Division of the City College School of Business. All the classes make tours of broadcasting stations and television centers as a part of the class work and recordings are a part of the scheduled instruction in many of the courses, according to Earl Ryan, Supervisor of Radio and Television.

Courses and instructors include "Survey of Radio and Station Practice," taught by Jo Ranson, Public Relations Director, Station WHN—New York; "Practical Radio Announcing," by Carl Mark, Radio Director of the Al Paul Lefton Advertising Agency, New York City; "Radio Scriptwriting for Production," by Ted Cott, Program Director of WNEW—New York and Jeff Selden, head of the continuity writing staff for Station WNEW; "Television Studio Operation and Program Production," by Raymond E. Nelson, President of the Raymond E. Nelson Advertising Agency, New York City; "Documentary Radio," by Seymour N. Siegel, Director of Programs at the Municipal Broadcasting System, Station WNYC; "Radio Broadcast Advertising," by Hershel Deutsch, Radio Director of the Gray Advertising Agency, New York City; and "Radio Audience Research," by Oscar Katz, Associate Director of Research in the Columbia Broadcasting System.

Workshops offered include: "Television Laboratory Workshop," "Radio Dramatics Workshop," "Advanced Radio Dramatics Workshop," and "Workshop in Television Commercials."

Record Shows or Participation?

(Continued from Page 2)

to remember five of the ten sponsors between them, or an average of 1 2/3 each. This was better proof than I had hoped for, but it brought out the point that the show was definitely identified by the artist on it, and that various clients got little sponsor identification.

Greater Product Identification

Now, we don't say that participating programs do not do a successful job. Some have done it and are still doing it. We do say that your own transcribed program, properly tied-in to your own commercial message, will supply greater 'identification' and, therefore, stimulate sales. That, after all, is what a client desires. It has been computed that a five minute show (time and talent) in most markets costs about the same as a participation. Tests comparing participations and transcriptions in cities of comparable size on stations of comparable wattage at approximately the same cost have been made. These tests invariably proved the five minute shows a better sales medium.

You may ask, "Will a listener tune in for a five minute show, or do they get it quite 'by accident' as the carry-over from a previous broadcast?" Our answer is that a good five minute show will create its own listening audience, and that listeners **will** tune in for it. This is Fact —not Fantasy! To prove the point . . . when Vick Chemical Company used "IT TAKES A WOMAN" (one of our recorded programs, incidently) in Canada, the ratings in various cities varied from 5.1 to 13.1, due to local conditions. CFRB-Toronto reported a record rating of 9.8 the **highest daytime rating** of any program of **any length** on that station. The show was on from 12:55 to 1:00 P. M., enjoying more listeners than the fifteen minute show which followed, and the ten minute show which preceded it. This proves conclusively that listeners tuned in **specifically** to hear "IT TAKES A WOMAN," a five minute show, which gave the client both rating and 'sponsor identification'.

Who Pays The Bills?

This sponsor identification business is just simple arithmetic. If you have a 20 rating and 50% sponsor identification, 10% of the people know who is paying the bills for your show. If you've got a 15 rating and 90% sponsor identification, then 13½% know who is paying the bills.

It's a proven fact, if an advertiser wants to get the most out of his advertising dollar he will select a good transcribed 5 minute show in preference to the participation every time.

N. Y. Outlet Features Special Recorded Program From London

Mobile Recorder Used For Interviews

"Pleasure Parade," a new series of fifteen minute recorded programs heard over WNEW-New York on Sunday evenings is designed to acquaint Mr. and Mrs. America with England's theatrical headliners. The transmission via BBC covers the entire entertainment world in London and is also carrying items and interviews with well-known Americans visiting England. Producers of the 13-week transcribed series use a mobile recorder for on-the-spot broadcasts from sporting events and other places of entertainment.

The Television Transcription

(Continued from Page 5)

Paramount Pictures, Inc., is employing a similar method in its experiments for theatre television, and it has already been revealed that Paramount is able to receive a television program off the air, film the sight and sound, develop and print the subject in from one to three minutes. This so-called "delayed" television makes it possible to provide many theatres with a television service for immediate use when the subject is received or for exhibition whenever desired.

One thing is quite clear: There is a definite place for the "transcribed" program in television and this will be borne out to an ever-increasing extent as more video stations reach the air this year.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3 No. 6 | 444 Madison Ave., N. Y. C. | June, 1947

Five programs aired over the Keystone Broadcasting System via transcriptions. Above: Bobby Gregory and His Cactus Cowboys on "Western Serenade." Pictured clockwise: Lum 'n Abner, Spike Featherstone and his Orchestra on "Tune Tabloid," Rita Carroll, also on "Tune Tabloid" and Jimmy Atkins and Hal Kanners' Band of the "Flit-Frolics" show.

Airing of Corwin's "One World Flight" Series Good Testimonial to Unlimited Value of Discs

(Last October, Norman Corwin, CBS writer-producer-director, and his assistant, Lee Bland of CBS' Documentary Unit, returned to the U. S. after a 42,000 mile air trip around-the-world; Mr. Corwin's prize as winner of the first "One World Award." During Mr. Corwin's journey he recorded his conversations with hundreds of people in many foreign lands. Upon his return, and after nearly three months of boiling this material down, Columbia broadcast a series of 13 programs. In the accompanying article, Mr. Bland tells of some of the complex recording problems encountered while the series was being prepared for the air.)

Turntable operators can best appreciate the complex recording problems of Norman Corwin's recent CBS series, "One World Flight."

For the 13 broadcasts we used discs as insurance against mechanical failure and also to facilitate cueing. On each broadcast, our two turntable engineers alternated in playing the recorded excerpts. Each man had a complete set of all recorded material, generally consisting of about 30 separate cuts on double-faced 16" 33⅓ rpm platters.

One of our main problems was to preserve the highest possible quality for the air shows. Since the engineers alternated cuts, it was therefore possible to save each man's untouched recordings for the dress rehearsal and broadcast by the simple expedient of switching

(Continued on Page 2)

That's Not Me!

Leo, MGM's famous lion, certainly was embarrassed when he learned how he sounded to the sound effects crew of WHN-New York. Seems that a lion's roar was needed to authenticate the broadcast of the opening of Metro's new recording plant in Bloomfield, N. J. So, the voice of an orang-utan, slowed to 33⅓ rpm, was used. A real lion's roar when recorded, according to the engineers, "sounded like belches after a Hungarian meal."

The RUBBER NETWORK

By Michael M. Sillerman, President KEYSTONE BROADCASTING SYSTEM, Inc.

We at Keystone have been given a variety of names. Since we are the only transcription network in existence, the uniqueness of our set-up has apparently invited many novel appellations. In the press we are often referred to as the wax web, or the wire-less network, and ever so often the "rubber network." This name has intrigued me because in many ways it describes our operation very well. We do have a flexibility and a resilience that resembles the characteristics of rubber. This elasticity has shown itself in the transition from the pre-war period to war times and back again into post war. Our transcription mode of broadcasting has the necessary stretch in following the country's economic course. Also the need to follow the contortions of the advertiser's distribution and peculiar conditions call for a certain amount of stretching and snapping to meet the situation.

Two Hundred Sixty Affiliates

The Keystone Network, stretching from coast to coast and now consisting of 260 affiliated stations, concentrates solely on the small urban and rural areas. This is what we call BEYOND-METROPOLITAN America, now often referred to as "BMA."

This emphasis on the small town is timely in view of the country's changing economy. Leading economists today state that two-thirds of the nation's retail sales are made in the small towns.

In the light of the facts and figures showing this emphasis on the small town market, the leading advertising agencies have learned that the Keystone Network has, for the first time in many decades, made it economically possible for the advertiser to buy these increasingly important markets as a unit, something they could not do before.

And the leading advertisers of the country have learned that the Keystone plan of operation makes it possible for them to promote their products via radio in these small markets on a comparable cost basis with their promotions in the large metropolitan markets.

These achievements have been ac-

(Continued on Page 4)

audio record

VOL. 3, NO. 6 JUNE, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

The writer (left) and Norman Corwin pictured as they wave goodbye to well-wishers who saw them off, a year ago this month, on their 42,000 mile, globe-circling trip.

Corwin Series Tribute to Discs

(Continued from Page 1)

sets of recordings after the preliminary rehearsals.

Our discs were produced at Columbia Records, from magnetic-type recordings made during the world flight. The original field recordings suffered frequently from faulty batteries picked up en route. Speed variations and quality differentials were corrected during the discing process, but only after hours of patient experimentation.

One of the most tedious aspects of the entire procedure was the job of splicing significant extracts, in the interests of time. This was accomplished manually by dexterous engineers who accepted the challenge to do the impossible and proved that the possibilities in re-recording are almost limitless.

Considering that all original field recordings were once dubbed before being piped for discing, that in the splicing operation—we dubbed again as often as necessary, and that the ultimate blends were copied to prepare the broadcast discs, there was surprisingly little loss of quality and intelligibility. To me, this is not only a testimonial to engineering "know-how" and equipment but it gives aid and comfort to producers and directors who wish to experiment with recorded documentaries.

This Record Collecting Habit

By Jim Walsh, Day News Editor
WSLS-Roanoke, Va.

Playing old records on my "Jim Walsh's Wax Works" program over this station comes naturally to me. Why shouldn't it? I became fascinated by the miracle of recorded music before I was three years old and can still remember the first record I ever heard. It was a comic skit called "A Night Trip to Buffalo" and it was played on an old-time talking machine with a large external morning-glory horn.

Within a few years, there was a phonograph in my home and before I was old enough to go to school I had begun making the rounds of the dealers in my little town, begging the latest monthly supplement describing the new records. (I had taught myself to read.) From that time I have never stopped collecting records—mostly by looking for them in Salvation Army depots, Good Will outlets, second-hand furniture stores and junk shops—until now I have more than 10,000 discs and cylinders, some made as long ago as 1895 and others issued only a week or so back.

Have Studied Old-Timers

In addition, I have made a life-long study of the careers of men and women, such as Ada Jones, Billy Murray, Henry Burr, Len Spencer and many others, who were the first recording artists, and now have a nation-wide reputation as an authority on old records. For a considerable time I have been collecting material for a book to be called "Record Makers," which will give the life stories of these old timers.

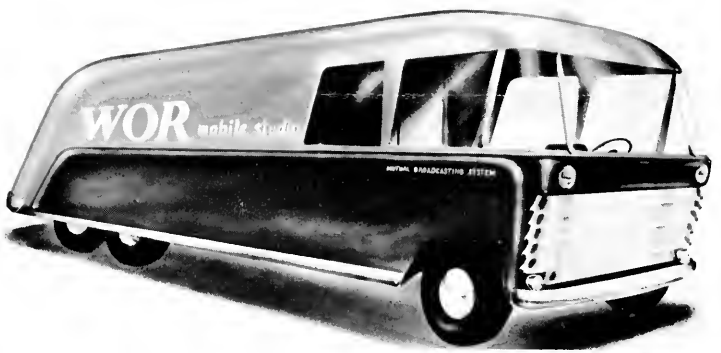
During the past five years, my monthly department, "Favorite Pioneer Recording Artists," has appeared in Hobbies Magazine, and I have also written extensively about record collecting for magazines such as the American Record Guide, This Week, Leisure, Magazine Digest and the Gramophone of London. Just before World War II, a Jap asked permission to translate some of my articles into Japanese for the benefit of the record collectors there. I don't know whether he ever got around to it!

Many of the surviving old-time recording artists, such as Billy Murray, who has been my particular hero since I was seven years old, have been my good friends of late years.

(Continued on Page 4)

Whoa—There Rich!

Ever wonder what would happen if on one of our recorded "whodunits", the fellow manipulating the discs would inadvertently spin the Wednesday installment before the Tuesdays? Some fun, eh? Well, the people in England aren't wondering any more, and to the ardent followers of BBC's ace dective Dick Barton, it wasn't funny either. A few Tuesday nights ago, sly Richard got himself out of a horrible predicament that none of his faithful knew he was in. No this sleuth is not that fast on the trigger. Some not-too-alert studio hand had given Barton's Wednesday night platter to Tuesday night's listeners.



WOR-New York's "Johnny on the Spot"

This streamlined studio on wheels will speed WOR newsmen and engineers to the scene of important newsbreaks and special events throughout the New York Metropolitan area. One of the largest mobile broadcasting studios in the country, the new unit is 27 feet long and houses a complete broadcasting studio, equipment room and driver's compartment. The 8' x 10' studio accommodates eight persons and is equipped with a full-size desk, chairs, and radio telephone to keep the unique broadcasting unit in touch with master control or the station's transmitters at Carteret, N. J. Four different short wave transmitters, as well as two fixed-studio-type recording units, two wire recorders and one spring-wound recorder are contained in the equipment room. An observation post and roof platform for news reporters, announcers and photographers will also facilitate televised special features.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

SAPPHIRE QUALITY CONTROL

In view of the widespread current discussion[1] of the subject of quality control, it is felt that a few sidelights on this problem would be of interest to the recordist. Although American industry as a whole first fully realized the value of such programs during the war, quality control has been active at Audio Devices since the company's start. Space will permit us to touch only on cutting stylus control in this article, so disc quality control will be discussed in a later issue of Audio Record.

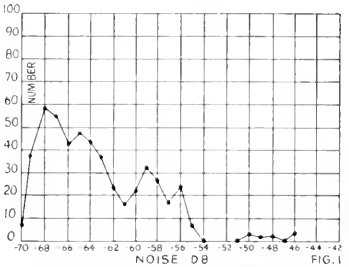
C. J. LeBel

Stylus Properties

Two main performance characteristics of a cutting stylus are noise level and high frequency response. The interrelation of these has already been discussed in detail by the writer[2], so it is enough to say here that a quieter groove may be cut, first, by increasing the length of the burnishing facet and, second, by improving the quality of the cutting of burnishing edges. Requirements for high frequency response set a definite upper limit to the length of burnishing facet which may be employed in a professional stylus. We are left, then, only one way to keep the noise level down; that is, to control the cutting edge and burnishing surface. In doing this we are controlling an invisible detail, for the small irregularities which cause differences in noise level are so minute that they are invisible under the most powerful microscope that can be brought to bear.

Quality Control at Audio Devices

Here at Audio Devices each sapphire is tested for noise level in a professional recording machine. Grooves are cut in lacquer discs then played back by a pickup feeding into a high gain amplifier and a standard VU meter. An 800 cycle high pass filter is used to remove the effect of turntable rumble, which because of its low frequency is virtually inaudible even though strong in meter reading. We are then measuring only the voltage produced by the record scratch. A stylus with noise level above the rejection point is sent back to the lapidary's shop for reprocessing.



Noise Characteristics—Typical Styli

We are occassionally asked why a 100% test is necessary; why not use sampling methods? This can best be answered by a glance at test results, most conveniently shown as a number of distribution curves.

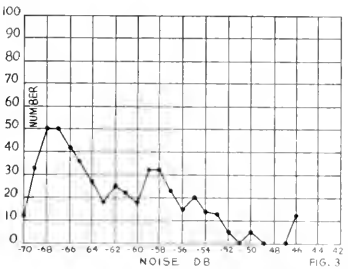
Distribution Curves

Figure 1 shows the distribution of noise levels in a batch of 501 points. The decibel values are meter readings, **based on an arbitrary reference level.** It is interesting to note the heavily skewed shape of the curve, as well as the double peak; the statistician would correctly say that this is not statistically "normal" data. This is a typical batch of styli, for rejects are only a small percentage.

An exceedingly good batch of 511 points is shown in Figure 2. While the rejection percentage is about the same as in the previous case, the secondary peak at -59 db is smaller in area, and the area under the main curve at -68 is greater.

What happens when the lapidary's laps are not in quite as good condition is typified in Figure 3, for a batch of 500. Note that the rejectionable percentage is several times as great and that the secondary peak has broadened considerably on the noisy side.

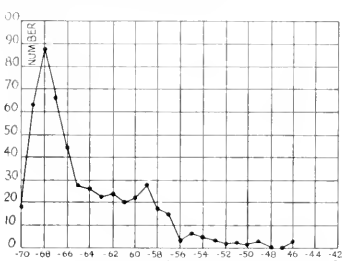
These styli were made by the best lapidary in the country at a time when processing was running very smoothly. Figure 4 is taken from earlier data on 605 points, and shows the result when the laps are temperamental. It is also similar to the results of an inexperienced lapidary, in that the major peak is ten to fifteen db noiser, and the rejects many more. Note that the skewness is much reduced, and the standard deviation is visibly much greater.



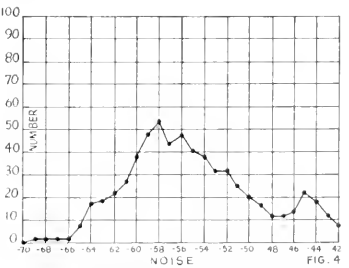
Noise Characteristics—Fair Quality Batch

Discussion

It is evident from this that 100% inspection is necessary. The recordist rightfully expects **all** his cutting styli to be usable. Sampling inspection would guarantee that the consumer would usually have to return not over several per cent but could not assure his finding **all** usable. According to the laws of chance, and since rejects run in clusters, a recordist might conceivably get three bad points in a single group of ten (i.e. 30% bad) these three being perhaps a quarter of the bad units from a batch of 500. So we must inspect all. Sampling is primarily useful where a defect will be caught at later stages of manufacture, or where so few rejects exist that it is cheaper to find one occasionally than to test all. A good example of the latter case may be found in small composition resistors. It was found that genuinely bad units would occur once in a hundred thousand units. It was cheaper to troubleshoot every twenty thousandth assembly for a bad



Noise Characteristics—Especially Good Batch



Noise Characteristics—Poor Batch

(Continued on Page 6)

The

Rubber Network

(Continued from Page 1)

complished by a simple but basic technique which finds much of its answer in the electrical transcription. The Keystone story is a success story of the transcription embellished with small station cooperation, seasoned with a firm belief in the selling power of the BEYOND-METROPOLITAN station and garnished with a realization of a tremendous aggregate market potential. These factors all crystalized into an integrated unit, are responsible for the realization of a national coast-to-coast transcription network. It is radio's adaptation of the old adage of the small strands woven together into a strong rope. Bound together into the transcription network, the small stations are a potent selling force.

KBS Operation Explained

Many of the country's leading advertisers and agencies know from first hand experience about the modus operandi of KBS. But some people outside the orbit of Keystone ask, how does it work. The answer is quite simple. KBS is organized and operates on a network basis. However the stations are linked together by transcription instead of leased telephone wires. Keystone distributes its sustaining and commercial programs on a transcribed basis. This gives the affiliates, as well as the advertiser and agency, flexibility and freedom of movement that is essential to good programming. Through its unique method of network operation utilizing the transcription, the commercial shows on the four major wired networks are potentially available through Keystone to the KBS affiliates. At the same time wired network advertisers can reach the BEYOND METROPOLITAN audiences by broadcasting their same wired network programs on a transcribed basis on KBS stations. Burns and Allen, and Lum 'n Abner, are typical of such commercial programs. The local stations benefit by such programming and the advertisers gain a tremendous audience in the Keystone areas. Some advertisers on the other hand, have developed their own such programs for the Keystone markets exclusively. Others find the KBS sustaining features valuable commercial programs. Grove Laboratories for example, sponsored a KBS sustainer titled "Western Serenade", featuring cowboy and hillbilly talent.

Advertiser—Small Market Radio Benefit

While Keystone has evolved the transcription and its network into a bull's eye for the last frontier of American domestic commerce, it serves the advertiser and at the same time helps small market radio. Throughout its history KBS has led the fight for recognition of the transcription and the small market station. In the field of local sales every KBS transcribed sustaining program is in effect a cooperative show, since the affiliates are encouraged to sell it locally. In all industry matters such as music copyright affairs, NAB, BMB, and general commercial program trends, Keystone is in the forefront watching all factors that have any bearing on the small market stations. The elasticity of the so-called rubber network which Keystone operates is typified by the view of the radio director of the advertising agency which leads the nation in radio billing, who states:

> "KBS, through its unique method of transcription network operation makes it possible for the advertiser to buy the small markets as a unit, and at a cost that compares favorably with competitive media. Therefore Keystone has placed the national advertiser within the reach of the small market station on a nation-wide unit basis. This to my mind is the real achievement of the network."

And on the other side of the fence, the manner in which the KBS rubber network lends its stretch in support of the affiliated station is typified by the following statement of a KBS affiliate:

> "Through KBS I have been able to get such programs as Lum 'n Abner, Burns and Allen, Philo Vance and others on transcription. I have been able to get such national accounts on my station as Sterling Drug, Miles Laboratories, General Foods, Lever Brothers, Emerson Drug, Lucky Strike, and others. The national advertiser, I feel, has found a way — through KBS and its transcription technique—to put shows on the small stations.
>
> "I am affiliated with KBS because I think they have done one helluva job in selling the national advertisers on small market radio. Instead of 'doing it with mirrors', or wires, "they do it with transcriptions. They perform a function that no other group or network does in radio — they sell the small markets exclusively."

Sam Hayes, Ace Sportscaster

THROUGH THE SPORT GLASS WITH SAM HAYES, well known sports authority, is an NBC recorded program which appeals to all sports lovers. In this quarter-hour show, Hayes, recounts thrilling moments in sports history and famous figures in the sports world. Memorable sports events are also dramatized. THROUGH THE SPORT GLASS is now being heard over NBC and independent stations from coast to coast.

This

Record Collecting Habit

(Continued from Page 2)

My collection contains more than 400 brands of records—most of them long since obsolete—from all parts of the world. There are many classical discs by dead or retired opera stars, but I have found for radio use it is best to restrict myself chiefly to playing old popular songs and humorous sketches. The "Wax Works", which began at WJHL in Johnson City, Tenn., in 1939 and was also given for four years at WDBJ-Roanoke, before moving to WSLS, where I am now day news editor, has been generally popular with all classes of listeners, but its appeal seems to increase for every decade the listener has lived. Many fans have thanked me for the relief it gives them from swing and crooners.

One of the outstanding items of the collection is a record of "Shine On, Harvest Moon," sung especially for me by Jack Norworth, who collaborated with the late Nora Bayes back in 1908 in writing the song. Jack said he had been so annoyed by persons who insisted that they had Bayes and Norworth records of "Shine On, Harvest Moon," despite the fact that they never recorded it, that he appreciated more than he could say my making no such claim. In fact, he appreciated it so much that he made the record and sent it to me for a Christmas present, so I could truthfully say, I was the only person in the world with a record of "Shine On, Harvest Moon," sung by the composer!

Recording's Advancement

By J. R. Poppele, V. P., Chief Engineer
WOR-NEW YORK

As C. J. LeBel, Vice-President of Audio Devices so aptly put it: "A device (or technique) may be radically improved either by re-design, or by merely improving every part (or procedure) by as little as ten per cent."

J. R. Poppele

At the WOR Recording Studios, Mr. LeBel's statement concerning improvement and re-design has been put into practice with gratifying results.

New amplifiers have been installed, advanced technique having been put into practice. Recording distortion has been reduced to a minimum, and the over-all technical improvement in all types of recording has been marked. New type recording heads are now in use. These heads are more sensitive and include temperature control. All of which produces greatly improved recordings, and this improvement has been well received by broadcast stations throughout the country, who have found an ever-increasing and wider use of transcriptions and records.

Making further advances in the art of recording, we have found that the use of improved cutting styli contour appreciably increased the signal to noise ratio in the recordings. New reproducing turntables of the latest type with direct drive and improved construction have assured rumble free, constant speed recordings.

Uniform quality has been the aim of WOR Recording Studios, and has enabled the manufacturers of popular records to offer to the public records of uniform quality and greatly improved technique.

Although the recording industry has not seen any particularly spectacular changes during the war years, there is, during the present transitional period, a continuous effort to improve here and there, and we believe we have advanced our technique tremendously by taking advantage of new equipment as it becomes available, and by continuously striving to function as efficiently as we can.

One of the greatest advancements on an industry-wide basis was the adoption of the N.A.B. recording standards which, when considered in the light of the many other technical achievements during the past years, puts the recording

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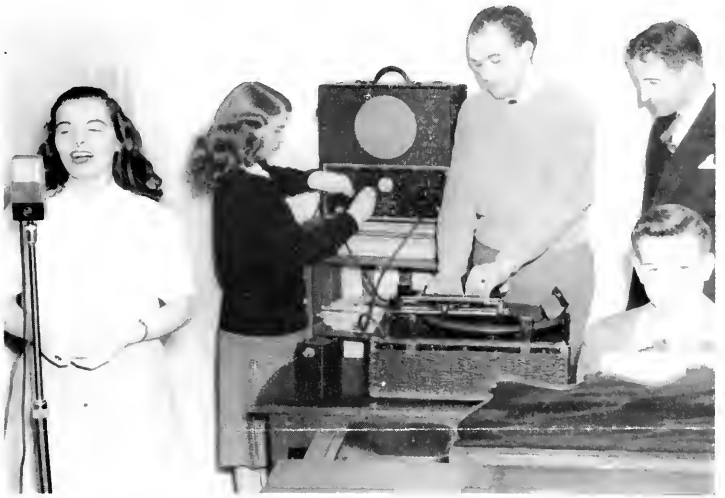

Prof. A. W. Bleckschmidt stands by to offer advice to Converse College School of Music students Loris Dean Burnette, Sarah Fant Jones, Louis White and A. J. Smith as they prepare to cut a recording.

Converse College's Courses In Radio, Music, Speech Find Many Applications for Recordings

Making recordings and mastering recording techniques are two important functions in the Radio and Recording Workshop Course conducted each year at Converse College, Spartanburg, S. C. In addition, making recordings is a supplementary part of the plan for music, speech, and physical education courses at the South Carolina school.

Radio-Recording Class Airs Weekly Show Over WORD-Spartanburg, S. C.

The Radio and Recording Class, under the direction of Prof. A. W. Bleckschmidt, is responsible for the weekly production of a half-hour broadcast over Station WORD-Spartanburg. Programs usually originate in an accoustically treated radio studio on the campus, but occasional broadcasts, open to the public, are given from the stage of the college auditorium. Both the studio and the auditorium are wired for radio pick-up.

Recording and broadcasting skills are acquired simultaneously— recordings being prepared for test purposes before each program is aired. Scripts are recorded, studied further, and re-recorded, as many as three times. On each occasion, the discs are played back and carefully studied for possible improvement.

Music Students Record Twice Yearly

With a similar interest in performance improvement, many members of Converse's music faculty request their students to make recordings twice a year, by which progress or lack of progress may be readily measured. Senior recitals are recorded in their entirety, and the facilities of the recording equipment owned by the college are available at any time to students who wish to record additional discs.

Many Disc Uses Found

A number of other campus uses for recording at Converse College have been discovered, too. Student and faculty compositions have been prepared for use in dance classes and dramatic productions, and duplicates of such records have been made when desirable. Speech and drama classes have taken advantage of the tool for corrective speech study provided by individual recordings. Finally, through the medium of recordings, original music by Converse School of Music students is submitted to publisher, and singers and instrumentalists bring their work to the attention of teachers and critics.

Audio Publication Standard Text

Basis for recording technique as taught at Converse College School of Music is Audio Devices' text book "How To Make Good Recordings". Audiodiscs, too, are used exclusively for all recordings made at the college.

"King of Jazz" Joins Disc Jockey Fold

Paul Whiteman, ABC's director of music, officially becomes a "disc jockey" June 30, when his "Paul Whiteman Club" begins its tenure over the American web. The dean of modern American music's new program will be a full-hour, afternoon, show and presented daily Monday through Friday over the entire ABC network. Whiteman is shown above, enjoying a hearty chuckle with another platter spinner, KXOK-St. Louis' Rush Hughes, during an interview in the Mound City's Kiel Auditorium where he was presenting an all-Gershwin concert.

Disc Data

(Continued from Page 3)

resistor, than to test all the hundred thousand resistors individually.

Quality Engineering

A running count of rejection percentages provides a valuable index to process quality and is sometimes the start of an engineering project. For example, see Figure 5, showing the percentage of rejects in 50 successive batches. Whereas rejections normally ran several per cent, they could run as great as 20% in irregular fashion. It was evident that, as the quality control engineer would say, the process was not under (statistical) control. We started an investigation and found that rejects in such noisy batches would often whistle, whereas whistlers were almost unheard of among the rejects of "normal" batches. After designing and building a special microscope and making hitherto difficult measurements on 500 points at a time, some correlation studies became possible.

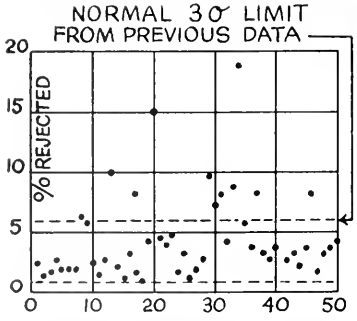

FIG.5 *Variation Symptomatic of Lack of Control*

It was soon found that two fundamental dimensions were not under statistically adequate control. Bringing them under control and computing the optimum relation, the number of out-of-control batches dropped profoundly. Thread action became more reliable, the average quality improved 10 db, and remained better. We had coordinated stylus design with lacquer coating characteristics.

After several months of good results, trouble reoccurred. A brief study showed that tool wear was causing a return to lack of control. This was easily remedied permanently and the trouble has not reoccurred since.

This is a good example of how the quality engineer can simultaneously improve product quality and reduce product cost.

References

1. *Cf. excellent monthly series in Trans. A.I.E.E.*
2. *Properties of the Dulled Lacquer Cutting Stylus* C. J. LeBel, JASA, *vol. 13, No. 3, pp. 265-273, Jan. 1942.*

Recording's Advancement

(Continued from Page 5)

industry on more solid footing than ever before. This advancement and these improvements have been reflected in the increased use of transcriptions and records by the broadcast industry, and it will be interesting to follow the improvement in the art of recording, as AM, FM and television stations increase in numbers.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3 No. 7 | 444 Madison Ave., N. Y. C. | July, 1947

Avalanches—Tiger Growls Exciting Listening . . . But Tough Work for Soundmen

WBBM-Chicago Sound Crew Finds Some Shows Require A Barrel of Gadgets

A man runs up stone steps to a house!
He is being pursued by another man!
First man slams and locks door!
Pursuer smashes door!
Two shots fired!!!
Body falls!!!

CURTAIN

***

These sounds make exciting radio listening but for WBBM-Chicago technicians they are merely routine. It happens everyday! Someone is always getting killed, doors are continually being smashed in and bodies fall all around the microphones. The equipment required isn't very complicated, either; all a sound-man needs is a marble block to "run" on, a door complete with lock, a couple of strawberry boxes to crush in simulation of a smashed-down door, two pistols firing blanks (on cue) and an assistant to fall to the floor—and, of course, recording equipment.

When a sound-man's life really gets tough and he starts breaking out with a series of headaches, is when a script calls for such devices as an avalanche or the sound of a pen writing under water. Such assignments require some expert improvising and a storehouse of assorted gadgets packed high to the ceiling and including nearly everything from a razor strop to a dish of Mexican jumping beans.

But such assignments as: "Get me the sound of a man washing his car—make it a sedan" or "I gotta have the sound of a wild buffalo calling his mate" never send WBBM's Chief Technician Urban Johnson or his assistants running for cover. Nothing has stumped them yet and recently the strangest sound in all of radio: the sound of a man who had fallen in a vinegar vat being pickled to death produced editorial comment throughout radiodom.

(Continued on Page 2)

Urban Johnson, WBBM—Chicago's Chief Technician, (background) and assistant Edward Wojtal, shown at a busy moment during a dramatic WBBM program full of sound and fury . . . and signifying something!

Many U. S. Stations Air French Recordings; Programs Cut in Paris—Pressings Made Here

Less than a month afer the liberation of France, the French Broadcasting System (Radiodiffusion Francaise) resumed its broadcasts to foreign countries, even though the war had reduced their facilities to seven per cent of pre-war standards.

The shortwave broadcasts in English to North America began in December 1944. They received immediate and most encouraging response. Hundreds of listeners, who hadn't heard the voice of Paris since 1940, wrote letters from all over the U. S. to express their good wishes and encouragement. So, during the summer of 1945, after Robert Lange, who had worked in New York on the Voice of America shortwave broadcasts to France during the war, was appointed Head of the North American Service of the French Broadcasting System, a relay service to America was inaugurated.

Many interesting programs, prepared in Paris, were relayed by U. S. stations east and west of the Mississippi.

(Continued on Page 4)

But Natch!

Several unofficial reports from New York claim that the quality of the transcribed Bing Crosby program showed considerable improvement during recent weeks when the show was recorded in Gotham instead of Hollywood. Larry Ruddell, ABC Recording Chief, whose net handles the program, says he is unable to account for any such improvement. "We have been experimenting with various other methods of recording, including tape and film," Mr. Ruddell said, "but so far we have not found anything that could supplant the discs"

audio record

VOL. 3, NO. 7 JULY, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Amateur Reporter Records Horror of LaGuardia Crash

Man's Vivid Description of Tragedy Broadcast Same Day by WOR-New York

The first radio reporter on the scene of the tragic plane crash at LaGuardia Field a few weeks ago was an amateur. He was Marino Jeantet, 32, a sound service man of Corona, L. I. Jeantet was driving his truck along Grand Central Parkway as the giant airliner roared across the parkway and crashed a few hundred feet away. Rushing to the scene of the disaster, Jeantet not only gave first aid, but set up his semi-professional recording equipment, which he was carrying along in his trunk, and reported the tragedy for radio station WOR-New York. Working in the rain for two hours, Jeantet vividly described the wreckage and the rescue work, as well as putting on a clergyman who offered a brief prayer.

Marino Jeantet

"I couldn't devote my entire time to making the records," Jeantet said, "because I was frequently called away to help carry a charred body to the improvised morgue in the cafeteria of the Academy of Aeronautics."

(Continued on Page 4)

Soundmen Need Barrel of Gadgets

(Continued from Page 1)

A man has to have an inventive mind to work as a sound technician, and Urb Johnson is just such a man. Among his souvenirs he counts his rain-making machine as one of his most ingenious devices. At first sight it looks like a washing machine on rollers with a huge porcelain tub and three overhanging shower bath sprays along with a faucet. The merit of this contraption is that it can be wheeled all over the station and no water connection is required. After a long search, Urb finally found a silent electric motor and pump which rotates the water through the tub and back into the pipes so that a mere half-gallon of water can produce the effect of an all-night rain storm in the tropics or the faucet can force a jet of water onto a tin can to produce the sound of a man washing a car—even a sedan! For light rain—garden party variety—water is allowed to fall gently on a piece of soft cloth placed on the bottom of the tub.

Many times Urb and his assistants, Louis Woehr and Edward Wojtal, have been called on to produce a sound without a moment's notice. Urb recalls the time a few years ago when he arrived at Great Lakes, Illinois, where Kate Smith, CBS singing star, was doing a benefit broadcast for the Navy personnel stationed there. When Urb arrived he learned at the last minute that the script required the sound of horses' hoofs—and not a nag was in sight! Quick-think-Johnson stepped to the microphone, bared his chest, cupped his hands and beat on his upper ribs in rhythmic fashion which sounded like a whole posse of western riders on the romp.

Johnson has many other tricks up his sleeve, too—more than the average magician, and his latest assignment for WBBM-CBS' "Adventurers' Club" called for the sound of a rumbling avalanche crashing down on a road. For this effect, Urb placed a ten-inch record over a 12-inch one and around the rim of the larger record he cut a ragged groove with a file. Rotated at different speeds on the turntable, this clever invention produced such a rumbling sound that a CBS page girl passing the sound department during the experiment, was sure Chicago had been hit by an earthquake and ran for cover.

Not only does a sound technician have to be an idea-man, a mechanic and an athlete (falling all over the place without getting hurt requires almost as much training as a prize-fighter) but he has to be a vocal actor as well. One of Urb's special accomplishments is the sound of a barking dog—any mood, any degree of anger which he can produce and for which there is a special pay rate.

Looking around the WBBM sound department, a visitor has no doubt that if the technicians on the staff are ever required to reproduce the sound of Jack climbing a beanstalk or an atom bomb sent to the moon—they can do it! From the floor to the ceiling there are more gadgets than you'll find in the average attic or hall closet: compressed air tanks, buggy whips, clocks, pans, flower pots, gongs, coffee grinders, straw hats, dishes, toy trains, hat boxes, balls, plates of glass, bottles, roulette wheels, punching bags, rubber plungers, auto horns that date back to 1904—anything—you name it!

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

QUALITY CONTROL IN THE DISC FACTORY

It is obvious that finding the finest recording lacquer is not, in itself, the only necessary guarantee of a good disc. In the May issue we discussed the problems underlying the development of a lacquer formula. Now we shall see what precautions are necessary in its use.

C. J. LeBel

A manufacturing system without a definite organization to supervise quality maintenance is one without guidance, so we were fortunate that our 1938 contract with La Societe des Vernis Pyrolac started us off with all the disc quality control know-how they had developed since 1929. This system has been enlarged in accordance with our own experience in the nine years since then, and as we make our own lacquer, control of product characteristics is all under one roof. Mistakes would be expensive, so a good quality control system keeps costs down at the same time that it improves quality.

Incoming Materials

General tests are applied to all incoming raw materials, as follows:

1. Solvents and diluents are checked for acid number, distillation range, non-volatile residue, specific gravity, and water content. Some manufacturers' products must be checked drum by drum; other organizations have not had a rejectable shipment in eight years, and a spot check suffices.

2. Film forming material is tested for solid content, viscosity, water content, and clarity.

3. Plasticizers are checked for specific gravity, viscosity, and color.

4. Aluminum shipments may be spot checked for flatness, surface smoothness, and surface cleanliness. This is seldom necessary as the circles have to be individually inspected as they go on the production line, anyhow.

In addition to the general tests, special procedures are applied to certain materials. These special tests are for contaminants which would not be shown up by the simple methods previously mentioned, yet which would be harmful in even small proportion. The test is repeated after purification, if the latter proves necessary. Drums of chemicals are tagged when approved.

Lacquer

The individual mix is made and filtered by the Lacquer Department, using tagged drums of chemicals. Individual mixes are used because continuous mixing (apart from the difficulty of handling so large a number of ingredients) would not permit of testing before passage of lacquer into the main system.

The filtering calls for the finest work of the chemical engineer due to the high solid content and hence the high viscosity of the lacquer. The high solid content is essential to single layer, homogeneous automatic machine application; and the high viscosity results therefrom by the inherent law of nature. Many filtering methods and media are available: single, multiple filtering; plate-and-frame filters and centrifuges; paper, cloth, and other filter media; various filter aids. It is most important that filtration be done properly, for no combination of methods is such that it can be used without extremely careful supervision, hence individual mixes are tested not only for viscosity and solid content, but also for filtration quality.

The Engineering Department then coats some test discs, and makes a recording. If this is satisfactory, a sample of the solution is retained in glass, and the mix is released to production. This mix is then blended with previous mixes in tanks and aged before use. Hence lacquer in the tanks and system at any given time is a blend of several mixes. This blend is refiltered just before passing to the coating machines.

The sample in glass is retained for several months, and is available in case of doubt as to absence of impurities, or question as to stability. It is always large enough to coat an adequate number of test discs, as well as provide material for analysis.

Disc Factory Control

The Engineering Department quality control personnel make a regular check of factory process conditions. It is interesting to note that to check functioning of automatic controls they have to read 118 thermometers. They must also check many air flow indicators, machine speeds, air filtering, and air conditioning

(Continued on Page 4)

More than 400 radio stations are currently cooperating in the U. S. Coast Guard's recruiting program by airing "Jive Patrol," a unique series of 15-minute transcribed programs designed to aid recruiting and to stimulate public interest generally in the humane work of the Coast Guard. Above, Bea Wain and her husband Andre Baruch (right) were among the top disc jockeys in radio who helped to promote the series. Jim Lehner (holding disc) of Newell-Emmett Company, New York, is author of the programs. Featuring the Coast Guard Academy band and its swing unit, the Coast Guard Cutters, the shows, which were offered to stations nationally as public service features, are slanted to appeal to young veterans and recent high school grads. Recorded station-break spots ranging from 10 to 60 seconds, and a 15-minute platter-chatter script series for disc jockeys have also been backing the six-month recruiting program. Newell-Emmett is now producing a 15-minute documentary disc for the Coast Guard as a tribute to the service's 157th anniversary, which will be observed on August 4th.

Extensive Use of Recordings at Stanford Univ. Explained by Head of Speech-Drama Dept.

From Mr. Hubert Heffner, Executive Head of the Department of Speech and Drama at Stanford Univ., Palo Alto, Calif., comes another account of the many uses of recording in audio-visual education today.

"In our basic courses, 'Training the Speaking Voice', and 'Public Speaking', we make voice recordings of each student in each section at the beginning of the term," explains Mr. Heffner. "This disc is then used in conferences with the student as a basis of analysis of his voice and speaking problems. And, as he develops through the term, additional recordings are made so that at the end of the semester the student has a complete record of his development attained during the course. This same method is employed in our course in 'Fundamentals of Oral Reading'.

"We also use recordings," Mr. Heffner relates, "in connection with certain of our drama courses, although these are not on a regularly scheduled basis as they are in the speech courses. These records are used only when it is desirable to assist a student with a problem of interpretation of a role. On the other hand, in connection with our debate, discussion and public speaking courses, we use recordings extensively. Throughout the term a number of the regular classroom discussions are recorded and played back to the students for further analysis and discussion."

The California school, also, uses many discs in recording various campus radio shows. Student announcers, too, use discs regularly as a check-up on their abilities.

"In addition to the classroom use of recording," Mr. Heffner concludes, "the Speech and Drama Department also employs a larger number of records for instruction purposes. For instance, in our record library, we have discs of various types of American dialects, examples of outstanding readings of literature, records of actor interpretations of great speeches from Shakespeare, and other classic drama, and recordings of certain major debates and discussion. These records are used in our public speaking, oral interpretation and acting courses.

Disc Data

(Continued from Page 3)

settings. A most important test is that of lacquer thickness, done by weighing a disc before and after coating.

Discs which have passed factory inspection are sampled regularly throughout the day, and checked by engineering personnel for the following:

1. Noise
2. Thread action
3. Static
4. Groove gloss
5. Wear
6. Coating thickness
7. Perfection of filtration

On the basis of these tests production discs are released for packing and shipping. It should be pointed out that the control number on the disc is on a chronological basis. The blending mentioned above and the quantities of raw materials are so great that it has been quite impossible to change the control number every time we use another drum of any given chemical.

Production discs sampled as mentioned heretofore are retested periodically to check for:

1. Noise level increase—a groove cut today should not be noiser when played back next week, next month, or next year (if dust is excluded). A groove cut next month, or next year should be no noisier than the one cut today, in the same disc.

2. Delayed wear—A groove cut today should last for just as many playings, whether it is played right after cutting, a month, a year, or a decade later.

Discs are inspected 100 per cent by the factory staff at each of the following points in the process: aluminum circles before coating, discs leaving the coating machine, discs leaving the drying conveyor, and when completed.

Note that every disc manufactured is **inspected,** but not all discs manufactured need be test cut. Successive discs are chemically identical, and a test on one is a test of the next thousand. Scientific sampling procedure is the basis of good quality control in this case.

A Few Sidelights

Experience has indicated the value of a number of precautions. Perhaps our readers will find them of interest:

1. Lint-free smocks for operators
2. Periodical washing of floors and walls
3. Special ventilation systems with low air velocity
4. Extremely large filters, each now as large as and rather heavier than an automobile
5. Minimum number of personnel in certain critical areas of the plant
6. Lint-free packaging—special wrapping for all discs; lacquer impregnated spacing rings to separate masters

Nevertheless, just as good filtration will not cure a bad formulation, every step in the process is a vital link in the chain. Break one link and the chain is broken. This intricate chain that is the disc making process is maintained by our personnel. Good personnel are as important as good equipment, so we are exceedingly fortunate in that over half of our key production personnel started with us in the early days of automatic-machine disc-coating.

Pioneer

On the afternoon of Feb. 3, 1935, Martin Block, whose name is a synonym for disc-jockey, "sold" the station manager of a New York station on the idea of presenting a record program. And, without a turntable, the creator of radio's famous "Make Believe Ballroom," conducted his first half-hour disc show with a tiny portable phonograph. Next day, as a result of a telephone barrage from curious listeners, the station gave the likeable Mr. Block a solid hour to spin his records . . . and he's been spinning 'em ever since. His new program "The Martin Block Show" over the coast-to-coast Mutual network is being presented direct from a special newly constructed studio, equipped with the latest recording equipment, in his home in Encino, Calif. KFWB-Hollywood, which also carries the program, feeds the show to the Mutual web.

Horror of Plane Crash Recorded

(Continued from Page 2)

In his WOR broadcast, which was heard on Fred VanDeventer's 11 P. M. news broadcast on the evening of the tragedy, Jeantet said: "There is no panic here among the personnel. Nurses and doctors are going about efficiently, not saying a word in their grim duty. The police are restraining crowds as the clergy, such as the minister you heard a moment ago, comfort some of the hysterical people viewing the scene."

Working without assistance, in the driving rain, Jeantet gave a dramatic and moving account of the disaster, which, until less than 24 hours later, had the horrible distinction of being the worst air tragedy in the history of American commercial aviation.

U. S. Stations Air French Discs

(Continued from Page 1)

The next step in Franco-American radio relations followed naturally: a plan for interchange of radio programs between France and the United States, to bring the peoples of the two countries closer together. An American Advisory Board was set up under the chairmanship of John S. Hayes, Station Manager of WQXR—New York, to help put this plan into operation. And, on April 7, 1947, the New York office of the North American Service sent out the first discs in a series of 12 different programs, 5- and 15-minute transcriptions in English, to 165 American stations.

Offered to all U. S. stations without cost for use as sustaining features, the French programs are recorded in Paris on the Champs Elysees and airmailed to New York where the pressings are made.

Six of the principal programs offered include HELLO FROM FRANCE—a weekly chronicle of amusing and interesting happenings in France, and more especially in the French capital, and interviews with famous celebrities; RENDEZVOUS IN PARIS—a weekly tour of Paris' nightclubs and cafes, with the well-known stage and movie actor, Claude Dauphin, as Master of Ceremonies; THE FOLK MUSIC OF FRANCE—a musical journey through France. Every week the Narrator, a folk ballad hunter, brings his latest discoveries in the field of French folk music; FIVE CENTURIES OF FRENCH MUSIC—twice every month, the symphony orchestras of France present the classical and modern music of their country; UNIVERSITY SERIES—a series of sketches of student life in Paris with visits to schools, museums, libraries and historic monuments; YOUTH SHOW—how teen-agers in Paris live at the present time, their family life, their schools, their amusements, their ideas.

Thus far the reaction to the series, which are not educational programs, but very informal on-the-spot reports of everyday life in France and of the customs and ways of its people, has been extremely gratifying. In less than two months of operation, the number of stations transmitting the discs has gone up from 165 to over 200 stations in 46 states of the United States, in Canada, in Alaska and in the Philippines.

As a counterpart to these shipments from France, American stations are preparing similar programs in French to be sent to France. Already NBC and the Voice of America broadcasts in French are being relayed by the French networks. Thus radio, with the aid of transcriptions, is playing a new and great part as a medium of peace and better understanding between nations.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3, No. 8 | 444 Madison Ave., N. Y. C. | September, 1947

AUDIO TO SPONSOR RADIO SCRIPT AWARDS

Many Cash Prizes To The Writers of Best Scripts

Competition Open to All Senior High School Students — Teachers of Winning Entrants Also to Receive Awards

Scholastic Magazines, New York, sponsors of the yearly "Scholastic Awards" for high school students, has welcomed Audio Devices, Inc., as co-sponsor of the 1948 Scholastic Writing Awards in the Radio Script Classifications. (Contest Rules and Awards listed on Page 4).

The Scholastic Writing Awards, one of the five programs in the annual "Scholastic Awards," has been in operation for almost 25 years. During that time thousands of students have sent in their work to be judged by nationally known writers. And, too, thousands of teachers have used the Writing Awards as an incentive to more and better writing in their classrooms. Many prize winners in the early years of the competition are now recognized writers. Among them are Gladys Schmitt, author of "David, the King," and Maureen Daly, associate editor of the Ladies Home Journal.

Radio script writing, the classification in which Audio Devices is the sponsor, is a good example of how a particular classification can grow in the annual contest. Originally, all radio scripts, together with one-act plays, were in a single classification. However, in the 1947 Awards, the competition recently completed, the scripts were separated from the plays and divided into two sections—drama and non-drama scripts. This change recognized the increasing importance of radio in the school. Following this innovation, the Association for Education by Radio offered its co-operation to the Scholastic Awards, in order to encourage radio writing by high school students.

Now this year sees another step forward. With Audio Devices coming into the picture, Radio Script Writing has been divided into three classifications—Original Radio Drama, Radio Drama Adaptation and Non-Drama Script.

(Continued on Page 4)

Tulane University Band in a recording session in McAlister Auditoruim on the Tulane Campus. Inset—George Boileau (rear) and Roy Grubb record the proceedings in the control room.

Recording Unit at Tulane University Credited With Improving Quality of Band's Performance

The portable recording and playback machine, which was installed a few months ago at Tulane University in New Orleans, has done one thing in particular for the Louisiana school—it has improved the performance of their band. Such is the opinion of Professor John J. Morrissey, head of the music department in the college of arts and sciences.

"Yes," says Professor Morrissey, "the unit, which I call my department's mechanical assistant conductor and teacher, has saved considerable rehearsal time and is a real professional error dector.

Home Work

"Last spring," continues the professor, "while our band was preparing for the annual concert, the recording equipment saved us many valuable hours. As an illustration, after the unit had recorded the band part of a vocal number, our vocalist would take the disc home and play it back on here phonograph while she sang the lyrics. Not only, in this way, was she able to practice the song over and over again until she got it just the way she wanted it, but we also eliminated the need of the singer and band appearing together for rehearsal at any one given time."

Professional Records Help Too

The unit according to Professor Morrissey, also proved its value in other ways, too. For instance, when he wanted to get something special into a specific number, the Tulane director, would put on a recording of the identical song as done by a professional orchestra, while the band listened. Then, it was their turn to try and duplicate the performance of the "pros." If the boys would trip over a few notes they'd know it soon enough when the disc was played back. After a second recording of the song, the record would again be played back while the boys listened for the improvement or the same mistakes.

(Continued on Page 2)

audio record

VOL. 3, NO. 8 SEPTEMBER, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

A Dog, A Guy, and A Disc

By Allan Dale, Musical Director
Radio Station KRIO
McAllen, Texas

(A short time ago, Allan Dale, record spinner of Station KFH Wichita, left his position with the Kansas outlet to take on the musical director chores of Station KRIO McAllen, Texas. And along with Allan went his assistant "Cheeta", Radio's only Canine Disc Jockey. We wrote and asked Allan to give us the story behind Cheeta's unusual career and here it is.)

How do you go about writing a story concerning a dog that is not just a dog . . . that is, not a dog in the true sense of the word? I ask you: Do you have to spell words in the presence of dogs to keep them from knowing your plans? Well, I have to do just that around Cheeta. Like most women, she is very

"Cheeta" Canine Disc Jockey

nosey. Born on a transport plane 500 miles out of New York City en route from Ireland, Cheeta is quite a cosmopolite. No, she's not a Sky Terrier but the party who gave her to me says she is a Norwich Terrier, so that's close enough, eh? The plane was bound for Bergatrom Field in Austin, Texas and that's where yours truly entered the picture.

Cheeta and I have been together ever since . . . almost six years now. I was a bachelor during most of this time and, of course, she spent the day with me at the radio station, or should I say stations. We've worked together in Austin, Texas, New York City, Miami, Fla., Wichita, Kansas, and now she is down here deep, deep in the heart of Texas in the beautiful Rio Grande Valley. We are lending our combined efforts in helping to run KRIO, a brand new and coming radio station.

Duties Confined To Old Platters

Now Cheeta, strange as it may seem, is a very fine assistant disc jockey. She carries out the old transcriptions and if I show her where to put them she will do her job without anything being said to her. Just give her the disc and that is all that's necessary. As yet, I haven't trusted the new transcriptions or records with her, but as she gets older and loses her teeth, I'll let her take care of these too.

Cheeta's talents do not stop at transporting discs, though. She can bark, or speak, on cue. Fine for dog food sponsors. She's a ham from the word "go" too. Give her a live audience and she is at her best. As a matter of fact, she's pulled me out of many a hole.

And another thing, she has learned to recognize my sign-offs and the minute the mike is cut, she is sitting up on her hind legs trying to tell me that she is ready to go. Frankly though, she thinks I'm terrible . . . she looks bored with every show I do.

Now that I'm not a bachelor anymore, (married the cute singer, Peggy Jones, one of the "Fabulous Dorsey" gals) my two singing females have me sitting up and speaking (to myself). But, I love it.

Blind since birth, Alonzo G. Squires (above left) is the capable m.c. of one of the most popular disc programs in the South. His early morning show "Breakfast with Squires" is heard daily from 5:00 to 8:00 A.M. over WAYS-Charlotte, N. C. Squires, a graduate of the University of North Carolina, where he received a law degree entered radio as a result of a guest appearance on the Fred Allen show back in November, 1941. The manager of a Washington, D. C., station engaged him for a telephone show where he stayed until he answered the call to return to his first love the South. Translating his commercial copy into braille and memorizing his continuity and the musical portion of his program, Squires breezes through the three hour stanza without any trouble at all. He never misses a station break nor a time signal. His head set is rigged up so that one earphone monitors the music and the other allows the control operator to cue him. The early morning show features folk music, old and popular tunes, and a goodly portion of Squires' humor, which has almost become a legend in these parts, and his homespun philosophy. In his three years over WAYS, he has become so popular and beloved that his name has become a household word.

Disc Unit Improves Tulane Band

(Continued from Page 1)

In this way, their progress was gauged perfectly.

"And then to," the professor added, "with our equipment the individual performer has an excellent opportunity to correct his errors and improve his playing immeasurably. If he is concerned with his inability to reach certain notes, all he does is cart the platter home play it back on the radio-phonograph and concentrate on his shortcomings until they are corrected to his and his leader's satisfaction.

Programming Time Cut

"In addition," Professor Morrissey concluded, "recording helps considerably in making up a program timing each individual number and, of course, the entire program."

The Tulane unit is composed of two large turntables, which operate by a dual motor (fast and slow), a recording amplifier, a dynamic speaker, a coaxial speaker, and two microphones, one for soloists and the other attached permanently to the ceiling of the University's McAlister Auditorium, located on the Tulane campus.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

GROOVE WAVELENGTH

A wide study of disc recording standards will begin this fall, as the industry resumes a standardization program interrupted by the war. Probably the most violent discussion will take place over the problem of groove and stylus contour, one of the oldest and most pressing and yet the least standardized of all lateral recording aspects. Groove-contour and reproducing-stylus tip bear a lock and key interrelation in this era of permanent-point styli, and the lack of general agreement on dimensions has been very objectionable. In the olden days a steel reproducing stylus would grind itself to a fit — now that fit must be predetermined. In this and subsequent issues of the Audio Record we plan to discuss the matter in some detail.

C. J. LeBel

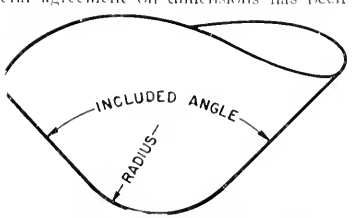

Fig. 1 Fundamental Stylus Tip Dimensions

It is generally agreed that the most reliable tracking occurs when the radius of the reproducing stylus tip is slightly greater than that of the groove, so that the curve rides on the straight side of the groove. If this is overdone, the tip will ride on the top corners of the groove, which makes for noisy reproduction and complete tracking failure at high volume passages. This imposes no **minimum** limit on the **groove** radius.

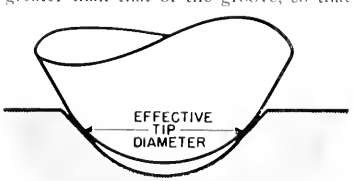

Fig. 2 Stylus-Groove Relation for Proper Tracking

Improved fidelity requirements in current recording practice make it highly desirable that the new standards be set so as to minimize diameter effect. Consider what happens when we attempt to trace a sine wave groove with a point whose effective diameter is equal to the wavelength of the groove. It can be seen that two factors affect tracking. Pinch effect (narrowing of the groove at higher velocities) distortion cancels out if the stylus is free to lift slightly when necessary. In the particular illustration given it will be found that, even when lifted, the stylus tip still cannot follow

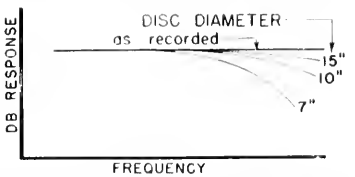

Fig. 3 Effect of Decreased Disc Diameter in Reducing Reproducer Output

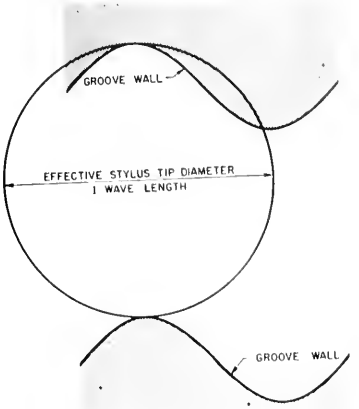

Fig. 4 Tracking Problem

the extremely small radius of the peaks of the wave. The point stylus is too large to track correctly at that frequency and velocity, a fault which occurs chiefly at the smaller diameters.

While practical factors make a drastic decrease in point radius questionable, clearly even a small change would be of help. To help visualize the dimensions involved we have drawn Figure 5.

The discussion will be continued in the next issue.

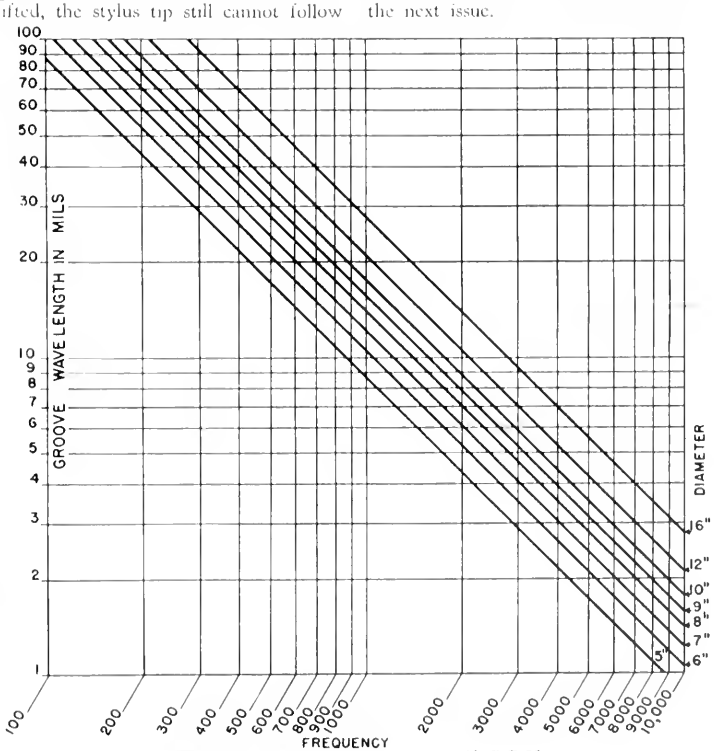

Fig. 5 Groove Wavelength at 33⅓ R.P.M.

Audio To Sponsor Script Awards

(Continued from Page 1)

All entries in the 1948 competition, to be judged by famous professional radio writers, must be in on or before March 5, 1948. (Where regional Writing Awards are held, work must be submitted to meet their earlier deadlines.) Winners in the three classifications will be announced in May, 1948. Shortly before this announcement, however, school principals will receive notifications, as well as the cash awards for presentation to their winning students.

Rules and regulations governing the contests and a list of the awards follow:

RULES AND INSTRUCTIONS

1. All students in grades 10, 11 and 12 in any public, private, or parochial high school in the U. S., its possessions, and Canada are eligible.

2. No radio script will be considered for the Awards if it has been entered in any other national competition.

3. Each script must contain a separate full-page sheet on the front; on this sheet should be written the following information:

(a) Entrant's name, home address (street number, city, state).

(b) Entrant's school and its address.

(c) Name of entrant's teacher.

(d) Name of entrant's principal.

(e) Age of entrant on March 5, 1948.

(f) Entrant's grade.

(g) Classification of entry (Original Radio Drama—Radio Drama Adaptation—Non-drama Script).

(h) Entrant's signature.

(i) Signature of entrant's teacher.

4. All scripts must follow standard radio script form. Maximum length: 3,500 words. Shorter scripts preferred.

5. Scripts in any one of the three classifications must be written in accordance with the following:

(a) **Original Radio Drama**—Must be an original treatment.

(b) **Radio Drama Adaptation**—Scripts based on published material; fiction, biographies, history. Accompany script with source facts; title, author, publisher. Where possible, use non-copyright sources.

(c) **Non-Drama Scripts**—May be interviews, dialogues, news, sports, variety programs, continuity for music, etc. Any form **except** drama.

6. Although students are free to enter the Competition individually, it is recommended that work be included in the group sent by a teacher after preliminary eliminations in the school.

7. Scripts should be typed or written legibly in ink, on one side only of paper 8½"x11". Pages should be numbered.

8. Entries may be sent at any time during the school year up to the closing date, March 5, 1948. Mail direct to Scholastic Writing Awards, 220 East 42nd St., New York 17, N. Y.

9. Scripts MUST be mailed flat (not folded or rolled) at the first class postage rate of 3c an ounce.

10. The decisions of the judges and of the editors of Scholastic Magazines are final. The right is reserved to withhold prizes if the quality of the entries does not warrant an award.

11. All scripts receiving awards become the property of Scholastic Corporation, and no other use of them may be made without written permission.

12. No scripts will be returned. (Students should keep carbon copies of their entries.)

AWARDS

STUDENTS

1st Prize (in each classification)__$25.00
2nd Prize (in each classification)__$15.00
3rd Prize (in each classification)__$10.00

TEACHERS

Teachers of students winning first place in each classification—25 Audiodiscs, 3 Sapphire Recording Audiopoints, 3 Sapphire Playback Audiopoints.

Supplementary Award

For each script submitted found suitable for publication in booklet form___$10.00 (Short scripts of skits 200-900 words—maximum playing time 6 mins.—that other school groups can produce are especially welcome.)

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3, No. 9 | 444 Madison Avenue, N. Y. C. | October, 1947

Who said . . . a Recording Engineer's Life is Dull?

By Gordon Sherman, Recording Engineer
KMOX-St. Louis

KMOX has made approximately 30,000 records during the past eleven years. Many of these recordings were made under unusual circumstances in the field.

Gordon Sherman

Today at KMOX we have four permanent recording channels and four field units. These field units consist of every type of recording equipment, including disc, wire and tape. Since 1936, however, practically all field records have been made with our disc equipment.

These field assignments have taken me into 25 states, Mexico and out on the high seas. It would be difficult to pick out any one assignment as the most interesting, as practically all involved different subjects and different technical problems.

In the summer of 1937, KMOX inaugurated a society page of the air and the field department was assigned to cover summer resorts frequented by prominent St. Louis citizens. Marvin Miller, former KMOX announcer, and I visited a number of exclusive Michigan beaches. At each location we set up our equipment on the beach. Miller, attired in a bathing suit and with a mike in hand, waded into Lake Michigan to interview St. Louisans at play.

The same year, Dan Donaldson, also a former KMOX announcer, and I were assigned to cover the erection of the Alton (Illinois) Dam, reporting various phases of construction and interviewing the workers on the job. At one time, my recorder and I located on a ledge no more than four feet wide and about 500 feet in the air. Danny, suspended in a basket by cable and swinging in mid-air, shouted to workmen nearby and received their shouted replies to his queries.

(Continued on Page 3)

WBKY-University of Kentucky "FM" station records a University Round Table discussion. Pictured left to right are Dr. Arnold Anderson, Dr. Amry Vanderbosh, Glenn P. Morrow and Dr. Howard Beers. Inset—Gloria Hedges and Rudolph Landin handle the recording equipment in the control room.

WBKY, University of Kentucky's "FM" Station Uses Recordings In Three-Fold Capacities

By Elmer G. Sulzer, Radio Director
UNIVERSITY OF KENTUCKY
Lexington, Ky.

The plaintive strains of Barbara Allen, sung by the Kentucky mountain girl, and accompanied on a home-made dulcimer, will not be lost to posterity, because of an activity which has been carried on for a number of years now by WBKY, the University of Kentucky's Frequency Modulation station. As often as opportunity permits, well-known performers of Southern Appalachian Balladry are brought to the University's studios and their entire repetoires recorded. Usually three copies of each record are made—the original which reposes undisturbed in the station files; a copy of which is used on programs; and another copy which is usually dubbed at 78 RPM and given to the performer.

As a result of this policy, the University of Kentucky's FM station is accumulating a definitive set of American folk records that some day will be priceless. Among the performers brought into the studios are John Jacob Niles

(Continued on Page 4)

Top Dailies to Conduct Regional Script Awards

Interest High in Writing Competition

Many leading newspapers will conduct preliminary contests in the 1947-48 "Scholastic Writing Awards," Mr. William D. Boutwell of Scholastic Magazines, sponsors of the yearly writing competition for high school students, announced recently. "Among some of the papers who have agreed to offer their services in promoting our writing awards," Mr. Boutwell said, "are: the Birmingham Post, Knickerbocker News (Albany, N. Y.), Dayton Daily News, Detroit News, Hartford Courant, New-

(Continued on Page 2)

audio record

VOL. 3, NO. 9 OCTOBER, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Recording and

The Small Market Station

By John Alexander, General Manager KODY-North Platte, Neb.

Every small market station in the United States, interested in covering the special events of its own territory, will find their recorders of inestimable value. Truly, they are worth their weight in gold!

John Alexander

At KODY we have five recorders. All of them are put to good useage practically every day. Our equipment consists of two portable transcription recorders, two tape recorders and one wire recorder.

If other small market stations are similar in operation to KODY, they do not have large program budgets. Money for direct lines and loops throughout our territory simply is not available. Consequently, our recorders are on the job night and day. At KODY, we have a policy of covering every special event that has significance in our area. Eighty per cent of these coverages are accomplished with discs, wire or tape.

At KODY, we carry a heavy schedule of commercial network. Consequently, recordings must be utilized so the various special event programs can be delayed to periods of time that are available. Example: In the winter, we cannot carry the Basketball Games at the time they are actually played due to commercial network commitments. We transcribe each game in its entirety and replay later the same evening.

Like many other stations today, we find the wire and tape recorders of tremendous value in obtaining up-to-the-minute news. Practically all our locally originated newscasts carry one or more recorded statements from local officials, celebrities visiting our city, or people who are in the news.

At KODY, we look upon our recorders as a great asset to our Program Department. We promote them and publicize the things we are able to accomplish with their help. We have displayed and demonstrated our wire and tape recorders before innumerable civic clubs and organizations in KODY-land.

It has been a profitable move on our part to invest in **good** recording equipment and the finest in discs, wire and tape.

Papers to Promote Script Awards

(Continued from Page 1)

ark News, Newport News Daily Press, Arizona Republic (Phoenix), St. Louis Star Times, Pittsburgh Press, Binghamton, N. Y. Press, and the Washington, D. C. Star. (These papers will offer special awards for winning entrants in their respective regions.)

"In addition to the great interest shown by the press this year in the "Writing Awards," Mr. Boutwell added, "student and teacher enthusiasm is greater than ever before. This may be due in part to the fact that we have several new classifications for students to choose from. Among them, of course, is Radio Script Writing (the classification which is sponsored by Audio Devices). With so many students interested in entering the radio field, it is almost a certainty that we will receive thousands of entries in this classification alone.

"And speaking of the radio script classification," Mr. Boutwell remarked, "teachers of students who plan to submit entries in this classification are reminded to advise their pupils that scripts which can be readily used by other schools in class plays or that can be adapted for use on Thanksgiving, Christmas or other holiday programs are especially welcome. And then, too," Mr. Boutwell went on, "scripts need not all be serious in structure. Although many fine scripts of this type will be received, those of a humorous nature will certainly be welcome also." (Teachers also are reminded that Audio Devices will award special prizes to those scripts found suitable for publication.)

More complete detailed information on the Radio Script Writing Classification in this year's "Scholastic Writing Awards" (rules and awards) may be obtained by writing Scholastic Magazines, 220 East 42d Street, New York 17, N. Y.

ATTENTION

The Editors of Audio Record welcome contributions from its readers. Any news concerning your recorded programs or other recording activities, that you believe will be read with interest by recordists, can be used. Photographs, drawings, or graphs needed to illustrate your material will be appreciated also. Address all contributions to:—The Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

disc-data for the Recordist

By C. J. LeBel, Vice President AUDIO DEVICES, Inc.

TRACKING PROBLEMS

Last month we began a study of conditions for good reproduction from lateral cut discs: the conditions under which the reproducing stylus will faithfully track the groove contour. In its most simple form, we discovered that when the effective radius of the stylus tip was large compared to the wavelength of the groove, poor tracking would result. This is an oversimplification of the problem, and we now take the matter up in more detail.

C. J. LeBel

There are three factors which govern tracking:

1. Reproducing stylus tip must be positively coupled to the groove walls. Such positive coupling can be achieved by having the spherical portion of the stylus tip ride on the straight side walls of the groove. This is easily achieved, when desired, by using a slightly larger radius for the reproducing stylus tip than was used for the cutting stylus tip. Incidentally, this mismatch increases the unit area pressure on the area in contact.

Fig. 1 Stylus-Groove Relation for Proper Tracking

To be sure that our recording lacquer will withstand this pressure increase, Audiodisc wear tests for years have been run with such a radius difference. Positive coupling is no longer a problem.

2. Pinch effect When the groove lateral velocity is high, the width of the groove diminishes. Pierce and Hunt[1] showed that this effect produced a second harmonic distortion in the vertical

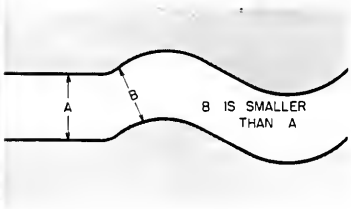

Fig. 2 Groove Width Decreasing at High Grove Velocity

direction, **which would cancel out in lateral reproduction only,** if the reproducing stylus could lift freely without giving electrical output. This lift is an extremely minute amount; in phonograph record reproduction with an ordinary steel needle the needle can often flex enough to produce the lift without record damage. When reproducing from Vinylite this is not enough, and vertical compliance must be engineered into the design. All modern transcription pickups are so designed, and at least two high fidelity home phonograph pickups have this feature. In short, pinch effect is no longer a problem.

3. Needle radius and groove radius — This portion of the problem is more mathematical in nature, but it may be appreciated by considering the effect of trying to follow minute groove convolutions of small radius with a stylus tip of larger effective radius. This is an oversimplification of a problem which is profoundly mathematical in nature, but it is nevertheless an apt illustration. A complete treatment has been given by Pierce and Hunt[1] and Lewis and Hunt[2].

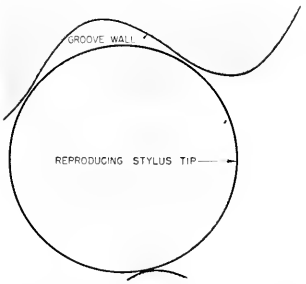

Fig. 3 Reproducing Stylus of Large Radius Failing to Follow Small Groove-Radius-of-Curvature

Brief consideration will show that if we are to faithfully reproduce high frequency tones at high velocity—which combination occurs when using NAB pre-equalization—we require a very small stylus tip. Unfortunately we cannot reduce the tip radius ad finitem, for a number of problems arise:

A. There is a lower limit to the radius which the lapidary can produce

(Continued on Page 4)

Much Recording Activity At Syracuse U's Radio Center

Discs—Tape—Wire Used

Equipped with both a wire recorder and two large recording tables for cutting discs, Syracuse University's Radio Center is kept busy transferring sound to groove and wire.

The uses to which recordings are put at the New York School are in general two-fold; for broadcast and for instruction. Regular program series are transcribed in the Radio Center studios and pressings made of the discs which are sent throughout New York state. "Forestry Journal" is one of such programs, which is cut every two weeks and used on 17 stations. The program is done by the College of Forestry and is aimed at education in conservation and better forestry.

Thomas Keiser (left) and Robert Pierce shown cutting half-hour program on two Syracuse University Radio Center recorders.

Among its recording functions, the Syracuse Radio Center cuts commercial discs for advertising agencies, records its own shows for playback on AM stations, WFBL and WSYR, when time is not available for live pick-up, and makes recordings for community groups for use by them.

Students also find recordings to be extremely helpful in performance courses. In Radio Announcing extensive use is made of recordings. Students in Radio Production cut entire dramas, music shows, etc., for playback to the class and criticism.

The equipment is used in making disc recordings synchronized to motion pictures for later transferral of sound to combined print of sound on film.

Another important function is the documentation of special events and University activities. Among the work done in this line were the recording of the entire day's ceremonies at the installation of Dr. Paul H. Appleby as Dean of the Maxwell School of Citizenship and the day-long celebration of Spring Weekend, both of which have been retained as historical university material.

Who said . . . a Recording Engineer's Life is Dull?

(Continued from Page 1)

On several occasions, the recording department was requested to furnish unusual, authentic sound effects.

On one occasion, I had to set up my equipment in the bottom of a lead mine shaft and run a mike and cable several hundred feet to a portion of a shaft that was being dynamited. Dressed as a miner, I had to do some crawling in a low, dark section of the mine—the only light coming from the miners' lamp on my cap—to get to the spot where the mike had to be installed.

The mike was placed in a small cavity of the shaft to protect it from flying debris. When the dynamite went off, the recorder, even though quite a distance away, lifted a full inch off the bench it was on. By careful dubbing back at the studio, we produced an authentic record of a dynamite blast, with all of the accompanying reverberations heard in a mine. The record is still in the sound effects file, carefully guarded.

One of the oldest and best programs on KMOX is the "Land We Live In." A great deal of work and expense are put into this show to keep it the best St. Louis production. For an episode on the story of Bagnall Dam, a complete musical score was written and special musical effects simulating the turbines and generators was to be used. The field department was asked to bring back all of the authentic sounds heard in the various sections of the dam and the generating rooms.

We recorded every large separate piece of mechanical equipment and even had the operators of the dam open the water locks so that we could record the water rushing over the locks. From these sound effects, three musical arrangers designed a musical score that was indeed unusual and authentic.

In the summer of 1945, our news editor and I set out for Camp Kilmer, New Jersey. We were assigned to cover the return of the 86th (Blackhawk Division) from Europe. At Camp Kilmer, we set our equipment up on a Coast Guard cutter and put out to sea. Several hours out, we met the transports. While our cutter crossed the wake of these ships, we recorded at close range the return of the boys to U. S. ports.

We stayed with the G. I.'s and returned with them on a troop train to Jefferson Barracks in St. Louis, Missouri. Whenever the troop train stopped for water we would jump out, find an a.c. outlet and start recording interviews with the boys.

In Pittsburgh, the train started pulling out in the middle of a recording.

The recording continued until our cable slack gave out, and then, with the train picking up speed and with the aid of several helping hands, the cable was reeled back into the coach.

Yeh, who said a recording engineer's life is dull?

WBKY, U. of Kentucky "FM" Station Uses Recordings in 3-Fold Capacities

(Continued from Page 1)

and Tom Scott, both nationally known collectors and performers of American folk music; the famous Ritchie sisters of Viper, Kentucky, and numerous mountain individuals and ensembles whose fame may be only local, but whose musical interpretations have great value for the student.

Not only balladry is recorded by WBKY. The final commencement address of a retiring University president, the 'round-the-world broadcasts on the "V" days, and many similar occasions have been recorded for possible programs in the future.

But it is not only for the preservation of material that recording services are valuable. A potential radio performer can realize more of his defects by listening to an audition recording, than by hearing hours of verbal criticism. Therefore, we record all doubtful portions of proposed programs so the performers can hear and study the dubious parts.

Of direct training value is the use of recordings in our classes. We have three courses in radio speech at the University of Kentucky—Radio Announcing, Advanced Radio Announcing, and Radio Drama, respectively. In all of these courses at the first of the quarter, each student must record certain material. At the end of the quarter, he does an additional recording, and a careful comparison between the two recordings forms a factor in the grade he gets.

Our third use of recordings is in the transcription of programs to be used by other stations, for in addition to the operation of WBKY, the University of Kentucky radio studios provides innumerable programs for Kentucky's commercial stations. At various times during the year, a single recording, such as Founders' Day Program, may be dubbed and sent to fifteen or more stations. The University broadcasts eight live programs a week over WHAS – Louisville, but recorded stand-by programs are kept at WHAS to be used in emergencies caused by line failures or other causes. Even on its own station, WBKY, transcriptions of its talent may be used when the time the talent can perform doesn't coincide with the time available on the air.

Disc Data

(Continued from Page 3)

whilst still retaining other tip dimensions at their correct values.

B. The unit pressure on the reproducing tip rises to an excessive value, producing rapid stylus and record wear, unless the total stylus force is also reduced. The smallest total stylus force so far commercially available, 15 grams, is about half the minimum available before the war.

C. Processing problems may arise.

Nevertheless some consideration will undoubtedly be given to all these factors by the various subcommittees just formed by the NAB.

References:

1. J. A. Pierce and F. V. Hunt, Distortion in Sound Reproduction from Phonograph Records, J.SMPE, vol. 31, no. 2, pp. 157—186, Aug., 1938.
2. W. D. Lewis and F. V. Hunt, Theory of Tracing Distortion in Sound Reproduction from Phonograph Records, J.ASA, vol. 12, no. 3, pp. 348—365, Jan., 1941.

BSRA Welcomes New Members

Applications for membership in the British Sound Recording Association are now being accepted from interested persons in this country. Further information concerning the BSRA and its aims can be obtained by writing W. W. Lindgren, 309 Longfellow St., N. W., Washington, D. C.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3, No. 10 | 444 Madison Avenue, N. Y. C. | November, 1947

A Radio Workshop Project

By Jessie M. Troupe
HAGGERSTOWN HIGH SCHOOL
Haggerstown, Maryland

Because children begin to listen to radio before they are able to read and continue to listen through their high school careers, the schools must assume the same responsibility for building radio taste as they have for the development of better appreciation for motion pictures and reading. Radio workshops for training students in studio and radio techniques can be set up in any school — from the largest urban senior high school with expensive equipment to the one-room rural "studio" using a tin can as a microphone.

An alert Workshop has just completed its second year in the Haggerstown High School, Haggerstown, Maryland, under the capable direction of Mrs. Marjorie Hoachlauder. Haggerstown High School has a student body of approximately 1200 members. The town, with a population of 40,000 boasts two radio stations: WJEJ affiliated with Mutual, and WARK with ABC.

In 1945 when this Workshop was organized, the enrollment was limited to 25 students because the work was to be only experimental in nature. Each prospective member was asked to fill in a card giving not only vital statistics of age, grade, etc., but also preference in radio activity: acting, announcing, script writing, production, recording operator, etc. No one with a grade below C on any major subject was selected from entrees who filled cards. Auditions were held before the public address system, the instructor noting on the back of the card such traits as good speech, speech defects, lack of self confidence, etc. These cards were used as basis for selection of the 25 students who would be admitted to the class. All the cards were filed for future reference.

After the first meeting the class was divided into divisions, each student being placed according to his interest and ability. A chief for each division was elected by the members. Girls from the commercial department were responsible for typing and mimeographing scripts.

Several meetings were given over to reading scripts to familiarize members with format and techniques of radio script writing. One meeting was spent in discussing signs, language, sounds and engineering. Thus the ground work was laid.

(*Continued on Page 4*)

Pictured above Allen Funt *(seated)*, "the man with the hidden mike," and his staff of "Candid Microphone" assistants. *Left to right:* Nina Heberer, Phil Pollard, Sonny Fox, Herb Exner, and Al Slep. *Inset: Left* — Funt conducts another "CM" interview (note mike on shirt front). *Right* — Funt baits a microphone trap for his next victim.

"Candid Microphone" ABC's New Tape Recorded Show Radio's Most Novel and Amusing Program

The trademark of radio — the microphone — is conspicuously absent when producer Allen Funt gathers material for the newest and most novel experiment in radio, "Candid Microphone," the Thursday evening ABC network feature which presents real life conversations of persons unaware that their words are destined for broadcast.

Seeking to capture the spontaneous reactions of persons in all walks of life to situations both common and uncommon, Funt brought a new twist to the interview type of radio program early this Summer by working with "mikes" concealed in dozens of different ways, depending upon the situations with which he dealt. The program, airing about six recorded vignettes each week, brings ABC listeners the frank, unrehearsed conversations of Funt's subjects in a manner that affords amusement as well as an insight into human nature.

With his portable recording equipment close at hand but hidden from view, Funt approaches his carefully conceived "human

(*Continued on Page 2*)

A Word to the ____ Was Sufficient

Ron Cochran, acting program manager of WCOP-Boston, couldn't get to sleep a few nights ago because his next door neighbors were having a party and had his station's midnight disc show blaring in all directions. Thoughtfully, Cochran called Bob Brenner, the program's M. C. and asked him to suggest that folks listening remember that some of their neighbors might be sleeping and tune their radios accordingly. Sure enough, the Brenner fans next door took the suggestion to heart, turned down the volume, and let the weary Cochran have his shut-eye.

audio record

VOL. 3, NO. 10 NOVEMBER, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

ABC's "Candid Microphone" Most Novel-Amusing Program in Radio

(*Continued from Page 1*)

interest" situations with a tiny microphone hidden under his scarf or coat lapel, in an arm sling, or as a hearing aid. In an office, store or home, it might be concealed in a flower vase, under a book or in a cigarette box.

All Victims Aren't Amused

Once, when Funt collusively posed as a barber and frightened the light of day out of an unsuspecting customer by bragging, in a trembling voice which betrayed nervousness, that "this is the first time I've shaved anybody" — and adding "do you bleed much" — the microphone was concealed in a sun lamp near the chair in the barber shop where the connivance occurred.

The under-the-lapel technique was used when Funt visited a bewildered garment maker on another occasion to negotiate a tailor-made zoot suit for a boxing kangaroo. A vase was used when the whimsy-loving producer and the banquet manager of a swank New York hotel arranged an eight-course dinner, with caterers, for six cats who, Funt, with tongue in cheek, told the maitre de hotel, had "won blue ribbons in a feline beauty contest."

Not all of Funt's ventures are primarily comical, however. Human interest vies with laughs in some situations, and in others, serious thoughts are provoked as the "Candid Microphone" makes its rounds.

Funt, with scissors in hand, edits his next broadcast.

Discs Used, Too

Since a tape recorder is used, extensive editing is possible to avoid repetitious dialogue, before the show goes on the air. In order to obtain an entertaining sequence, often as many as 100 splices are made on a single program. Finally, the entire program is re-recorded on discs for the actual broadcast.

"Candid Microphone" goes on the air with the only audible censor in radio. Instead of a blue pencil assault on a prepared script, the audible censor blots out words unusable on the air when an interviewee occasionally bristles at Funt's always deliberate affrontery.

Naturally, nothing objectionable to the parties concerned is aired, and no names are used. After a sequence is recorded, Funt's subject — or sometimes, victim — is told that their conversation was recorded and his or her permission is obtained to use it on the air, with anonimity assured. And Funt seldom encounters a refusal.

Don Wike, announcer; Don Keith, producer; and Byron Towery, engineer, record another KUJ tabloid sportscast of local high school football game.

KUJ's Capsule Coverage Of Local Football Games Proven To Be A Success

Tabloid Sportscast Tape Recorded

Network committments make it impossible for Radio Station KUJ-Walla Walla, Washington to air play-by-play broadcasts of the local high school's football games, but thanks to Don Keith, public relations man, and tape recording, the station has found a solution to the problem. Here's how.

Every Play Recorded on Tape

On the day of the games, KUJ assigns its regular sportscasting crew, along with a recording engineer and a tape recorder, to cover the contest. Every play of the game, as in a conventional broadcast, is described by the announcer and recorded on tape for presentation at a later time. However, when the game is finally aired, usually the following evening, only the big thrills or scoring plays are heard. But, in addition to the game's action, members of the two competing teams are interviewed and their interesting remarks are made a part of the transcription.

Thus, KUJ is able to present not only the game's highlights, but also the story behind each important play. And, according to KUJ staff members, the quarter-hour recorded tabloid sportscast packs much of the same wallop as the full-game broadcast.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

NEEDS OF THE EDUCATIONAL RECORDIST

Now is an especially fitting time to discuss the subject, for this article is being written just as the 1947 Conference of the Association for Education by Radio comes to a close. Many broadcast and recording organizations have been called on to advise their local educational institutions on recording problems and facilities, — as our correspondence shows. Hence the discussion is addressed to both commercial broadcaster and educational recordist.

C. J. LeBel

Historical

It has been interesting to watch the growth of American educational recording. Attention to educational applications began shortly after Edison's original invention, but for many years the complexities of wax recording restricted its use to commercial recording companies, and to production of regular catalog items. In the early thirties the process of embossing grooves in aluminum was perfected. Its quality being too poor for general professional use, some attempt was made to sell it to the educators. This was not very successful. Shortly thereafter recording on lacquer (coated on aluminum) was developed and came into limited professional use. Being a cut groove, the sound quality was definitely better, and some educational applications were found. The same factors that hindered professional use were objectionable to the educator, viz., the blank discs hardened rapidly, the cut disc developed high distortion and noise in a short time on the shelf, the record could only be played a few times before being completely worn out, and the thread was explosively inflammable. Lacquer thickness was often uneven.

These defects were due to use of incorrect plasticizers in the coating, in insufficient amount, and poorly developed coating methods. The introduction of the first Audiodiscs changed this: the plasticizer formula was much more complex, the plasticizer was utilized in much higher proportion, and machine application of lacquer

was used. The correct plasticizers gave the lacquer high stability, changes with time were no longer a problem, and thread inflammability was reduced to a reasonable value. Machine application gave complete uniformity of thickness.

Lacquer Makes Educational Recording A Success

These improvements made recording on lacquer a professional success, but they also made educational recording universally available, and fostered its rapid growth. While some attempt was made to sell low cost home recorders and home recording discs for educational use, it was soon found that professional standards of clarity and durability were necessary.

While the first educational applications were for speech correction work, broader vistas soon opened. Educational broadcasting was growing. Whereas a single microphone and recording machine were ample for speech correction, broadcasting posed new problems. The student was accustomed to professional broadcast standards, and to hold his interest production methods and mechanics had to be equally well handled. It was found that better sound quality was essential, for fifteen to thirty minutes of listening to unclear sound was very fatiguing. The student became restless, his attention wandered, and without formalizing the matter, it became generally recognized that sound quality would have to conform to professional standards. The "fatigue factors" in sound reproduction would have to be kept at an absolute minimum. If we may presume to coin a new phrase, the following psycho-acoustic equation was developed:

Sustained Student Interest = Interesting Subject Matter + Aural Presentation in a Non-Fatiguing Manner.

All of this experience has had considerable effect on the educational recordist's requirements in the way of facilities. The dramatic recording facilities suggested may appear over-elaborate to some, but this is incorrect. While work can be done with less complete equipment, it will be smaller in scope, or poorer in production quality, or will be produced at an excessive cost in time and material (due to need for test cuts or retakes). A glance at current educational practice indicates that these facilities are gradually becoming the standard for a complete educational recording setup.

Facilities

The facilities required will vary with the work to be done, of course, but some form of each of the following must be provided:

A. Studio
B. Speech input system — input controls, amplifiers
C. Recording machine
D. Recording raw material
E. Reproducing facilities

Speech Correction

Speech correction recording has generally been done right in the classroom, and with one student performing at a time. Since acoustical conditions are seldom good, this indicates that the single microphone used should be of a directional form. The recording machine is generally of simple form, often a single-speed type cutting only up to 12" diameter. While inside-to-out recording is more convenient, it has been found preferable to use outside-to-in cut for records so made can be played on the home phonograph, which the student usually wishes to do. Cut in the reverse direction, they cannot be played on a turntable fitted with the usual automatic stop or changer.

Since faithful reproduction, "presence", is highly desirable, it becomes necessary to use a professional cutting stylus — stellite has been preferred because of greater ruggedness — and a professional quality disc. As before and after comparisons are desirable, it is necessary to use a disc with unquestioned permanence — one which will be as quiet and undistorted a year after as on the day of recording.

For making a quick survey of a class at the beginning of a term, it has been found very economical to cut a 16" disc at 33⅓ rpm. It is possible to place fifteen to twenty voices on each side of the disc, separated one from the other by short spirals.

Radio Dramatics and Broadcast Transcription

Whether played over the school public address system or over an educational broadcast station, the dramatic recording must stand comparison with professional broadcasting, to which the student daily listens. The mechanics of the production must be well executed, the sound quality good. This imposes definite equipment requirements.

The studio must be adequate in sound isolation, reverberation characteristics, and size. Inadequate isolation means that many records will be spoiled by extraneous sounds, and inadequate acoustical treatment implies serious problems in setting up to record. It is apt to mean a "tricky" studio, full of bad spots, and most difficult to use. In practice this is apt to make recording quality rather uneven, for available time is limited, and likely to be used in rehearsing the cast, rather than in rehearsal for sound. The studio should be large enough to accommodate the largest group. There is nothing so futile as trying to put a school orchestra of fifty in a small speech studio. Fortunately, the trend in school design shows a growing appreciation of the fact that broadcast dramatics has become as important as stage dramatics, and a studio is often provided for use with the public address system. Recording from the same studio is easily accomplished.

The speech input system must provide adequate flexibility. Facilities for simultaneous use of three microphones are the minimum necessary, and four mixer positions are more convenient. Two turntables for music are also necessary. Means of inserting a sound effects filter to control at least one microphone circuit are highly desirable. It goes without saying that the amplifiers must have both good performance and reliability. Unlike a broadcast station, most schools have no maintenance man, and an amplifier breakdown is a serious matter.

The recording machine should be complete in its facilities. Both speeds should be available, and provision should be made for change of pitch. A spiralling device should be provided. Outside-to-in cutting should be used, and this will make a suction device for removing the thread highly desirable.

The recording disc must provide professional recording quality, of course, but more is required. Complete uniformity is necessary and long life. Educational discs form part of a library, which must be reproduced next year, the year after, and the year after that. They must be durable, as regards repeated playing, but lack of deterioration with time is equally essential. Chemicals used in the formulation must be time tested for proven permanence. A disc which becomes noisy or distorted in two or three years is not satisfactory.

Reproducing Equipment

Playback machines of professional quality are available for use in playing an educational transcription to a class. If any criticism may be made of them, it is that the portable loudspeakers are generally too small and too inadequately baffled for satisfactory reproduction of anything but speech.

The educational broadcaster needs especially a definite setup for re-recording. One concomitant of the production of successful program series is the process of exchanging copies with other groups. Very seldom do the quantities warrant processing, so the amount of re-recording to be done is very considerable—a serious burden unless a regular setup is made for that purpose.

Conclusion

It has been very interesting to watch the development of educational recording from an idea to a rapidly growing movement of well documented value. We salute those who have made recording an essential part of the modern educational process.

ATTENTION

The Editors of Audio Record welcome contributions from its readers. Any news concerning your recorded programs or other recording activities, that you believe will be read with interest by recordists, can be used. Photographs, drawings, or graphs needed to illustrate your material will be appreciated also. Address all contributions to:—The Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

PLATTERS FOR PULLERS

At the American Dental Association Convention, held a few weeks ago in Boston, Harold I. Primus, Manager of the Diamond Crown Division of Audio Devices, which produces diamond abrasive dental instruments, recorded interviews with visitors to the show on 10" Audiodiscs and gave them the recordings to take home as souvenirs. (Above photo shows Diamond Crown booth with microphone on table in foreground — recording equipment was located in rear of booth). Interviews with many leading foreign dental representatives, speaking in their native tongues, highlighted the recording sessions.

A Radio Workshop Project

(*Continued from Page 1*)

At the start the equipment was poor — books, blackboard and an elementary public address set-up composed of a junior velocity microphone and a 15 watt amplifier. New crystal microphones with full length adjustable stands and additional shorter desk stands were purchased. By January of 1946 an adjoining room had been arranged to provide a "studio" creating the broadcasting illusion so necessary to the success of any radio laboratory. To this were added a recording machine and a play-back unit (two speeds, 33⅓ and 78 RPM), the former for recording students' voices, the latter for playing back sound effects during rehearsal.

During the first year sixteen actual broadcasts were made over WJEJ. The initial broadcast during American education week in November emphasized the relation of school, home, and community. At Christmas O'Henry's "Gift of the Magi" and Moore's "A visit from St. Nicholas" were dramatized. Thirteen vocational guidance programs written and produced by the Workshop were presented over a period of thirteen weeks. This "Looking Ahead" series dealt with the problems of school and after-life adjustments. Another step in advancement was chalked up when these broadcasts were listened to in schools all over the country.

In May the class and instructor chartered a bus to New York City for the purpose of visiting NBC and CBS studios. They enjoyed Nila Mack's "Let's Pretend" in its pre-broadcast rehearsal and the famed Cities Service show, "Highways of Melody".

With the approach of a second year it was possible to organize two sections of 25 students each. Only seniors were eligible because of a limited teaching staff in the English department.

A new location was arranged with a small control room, a rectangular studio and an adjoining classroom of regulation size. A cut-in microphone system was installed to facilitate giving directions during rehearsals, and a simple decibel meter control box was added. Then it was possible to produce scripts which contained sound effects, background music, and special effects. It was also possible for the teacher to work with a cast in the studio while the remainder of the group worked at other

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projects in the class room.

More advanced programs were worked out. Students participated in a Student Forum of the Air broadcasted over WBAL. A panel discussion was presented by four social studies students presenting affirmative and negative arguments in answer to the question: "Is a democratic form of government similar to that in the United States practicable in all other countries of the world?" This was followed by questions from the floor directed to the panel. Audience participation came from the entire student body in applause.

In the spring different groups undertook two six-week series, "Sing and Listen," a music appreciation project, and "130 Story Book Street," a dramatization of fairy tales. This last series was directed toward the elementary school audience.

Again the course was concluded with a New York trip, the students seeing James Melton's "Harvest of Stars," Armstrong's "Theater of the Air," "The Mighty Casey," N. B. C. Symphony and "Let's Pretend."

At the close of the second year the instructor was able to list certain gains made by students in her three sections.

1. Learning to work with groups.
2. Acquiring habits of accuracy and a sense of proper timing.
3. Overcoming self-consciousness.
4. Experience in script writing.
5. Developing good voice and speech habits.
6. Handling sound techniques.
7. Developing hidden talent.
8. Developing the appreciation of the art of radio broadcasting.
9. Awakening a realization of the power of modern radio as a medium of propaganda.
10. Assisting in administration of school program.

The workshop will be expanded in the 1947-1948 school term to include more students interested in radio. The instructor, however, feels that additional changes must be made if the program is to mature.

1. Release of the radio instructor from the responsibility of teaching classes other than radio.
2. Establishment of a central office located conveniently for the coordination of high school, junior high school and elementary programs.
3. Appointment of a Director of Radio Education to plan, supervise, and carry out the radio program activities on a county-wide basis.
4. More contributions and participation from other departments in the school.
5. Installation of machinery for re-broadcasting to meet each class period need.
6. More consciousness on part of public and school officials to the role schools must play in the national radio scene.

Radio workshops are not ends in themselves, but they definitely have their place in the future of the radio as a medium for educational purposes.

As We Go to Press

Audio Devices, currently co-sponsor of the 1948 Scholastic Writing Awards in the Radio Script Writing Classification, will also co-sponsor the NATIONAL RADIO SCRIPT CONTEST for college students.

Under the auspices of the Association for Education by Radio, the National Radio Script Contest, will offer prizes for best written scripts to students enrolled in recognized colleges and universities in the United States. Complete details along with rules and regulations and list of awards will appear in our December issue.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 3, No. 11 | 444 Madison Ave., N. Y. C. | December, 1947

AUDIO CO-SPONSOR OF AER SCRIPT CONTEST

Valuable Cash Prizes to Writers of Best Scripts

Competition Open to All Students of Recognized Colleges in the U. S. A.

Audio Devices, co sponsor of SCHOLASTIC MAGAZINES' 1948 "Scholastic Writing Awards" (Radio Script Writing Classification), for high school students, will also co-sponsor the 1948 National Radio Script Contest.

Under the auspices of the Association for Education by Radio, the National Radio Script Contest will offer prizes for best written scripts to students enrolled in recognized colleges and universities in the United States. (Contest Rules and Awards listed on Page 4.)

The following educational organizations and publications will act as co-sponsors for the contest: National Council of Teachers of English, National Educational Theater Assn., Player's Magazine, Scholastic Magazines and Writer's Magazine.

The National sponsors who, with Audio Devices, have contributed cash awards for winners, and have underwritten the expense of the contest, include: Alpha Epsilon Rho (Honorary Radio Fraternity), General Electric Company and the National Association of Broadcasters. Also, Encyclopedia Brittanica, Inc. will award a complete set of the Encyclopedia Brittanica to best scripts in each of the four regular classes.

Regional sponsors who will make special awards in their particular regions, thus far include: the Newark News and Radio Station WNJR-Newark, N. J., and the Oklahoman & Times and Radio Station WKY Oklahoma City, Okla. Many more regional sponsors are expected to participate in the contest before it closes.

The National Radio Script Contest will divide scripts into regular classifications and one special classification. These classes follow:

Class 1. Original Dramatic Script. 14 min. 30 sec. in length.

Class 2. Dramatic Adaptation. 29 min. 30 sec. in length.

Class 3. Non-dramatic scripts for one voice (talks, news, sports, women's programs, etc.). 14 min. 30 sec. in length.

(Continued on Page 4)

The Adelphi College Radio Workshop, under the direction of Mrs. Mary Lou Plugge (back to camera,) Chairman of the Long Island School's Speech and Dramatic Arts Department, are shown recording their adaptation of Ernest Hemingway's "The Snows of Kilmajaro" which was broadcast later over Station WGGB-Freeport, Long Island.

Adelphi College Utilizes Recording Equipment In Speech Training, Drama and Radio Courses

There was a time when educators had to literally "push" students into speech training courses. However, such is not the case today. At least not at Adelphi College, Garden City, Long Island.

For Adelphi students, according to Mrs. Mary Lou Plugge, Chairman of the Long Island school's Speech and Dramatic Arts Department, welcome the opportunity of improving their speech in Adelphi's 'Fundamentals of Speech' course. "They feel," Mrs. Plugge related, "that our speech course is an objective rather than a subjective analysts of their vocal qualities. Consequently, we rarely encounter a student who takes the attitude that he is being persecuted when we attempt to correct his speech defects.

"The success of our speech training program," Mrs. Plugge said, "is largely due to our recording equipment. Time and time again hours of instruction have been saved by simply allowing a student to hear his own voice played back to him. And the

(Continued on Page 4)

Natl. Boy Scout Council Launches Recorded Series

Thirteen Transcriptions Dramatize All Phases of Scouting Activities

A series of thirteen quarter-hour electrical transcriptions for the use of the Boy Scouts of America will be released this month by their National Council headquarters in New York City.

These are being made available in response to many requests from all parts of the nation. They are to be used on a sustaining basis by local radio stations in cooperation with the local Boy Scout Councils. Provision for a one minute local "tie-in" announcement has been made so

(Continued on Page 4)

audio record

VOL. 3, NO. 11 DECEMBER, 1947

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Frank Sinatra

Recording— And a Singer's Success

By Frank Sinatra

SINGING STAR OF COLUMBIA RECORDS

It is the very rare exception when a musical artist, particularly a singer, achieves any amount of success without substantial assistance from records. This is clearly evidenced when one analyzes the success formula for any number of the top singers enjoying popularity today. Frankie Laine is a perfect illustration of this point.

For years Frankie knocked around waiting for his "big break". It finally came in the form of a disc with "That's My Desire" printed on it. Now he's a big star.

There is no doubt that live radio shows play a tremendous part in the growth of an artists' reputation, but stop and consider a moment the important part being played by approximately two-thousand "disc-jockeys" all over the country, not to mention the hundreds of thousands of juke boxes that reach an audience that very rarely see live talent. The average independent station devotes a very large part of its schedule to the playing of records. In short, all other mediums combined cannot equal the vast audience being reached daily by these platter spinners.

Up to this point we have concentrated mainly upon the promotional effect of records — and have completely ignored an equally important phase of this question — money. A record contract almost guarantees a singer some sort of steady income — depending of course on the singer's talent and reputation. A couple of hit records not only can insure the success of an artist, but can provide more than ample financial support, until he gets a radio show or a movie contract — and from there it continues to be a reliable and often sizable source of income.

And then too, thanks to the improvements made in recording equipment and techniques, during the last few years, the singer is able to reach his unseen audience with a more truly life-like reproduction of his voice.

What the result of the approaching "recording ban" will be I certainly cannot predict, but I sincerely hope that the parties involved come to some sort of agreement before many months have passed.

29 Stations Show Interest In Script Writing Awards

Outlets Invited to Serve As Regional Sponsors

Recently SCHOLASTIC MAGAZINES, sponsors of the yearly "Scholastic Writing Awards" for high school students, wrote radio stations throughout the country explaining the expanded Radio Script Writing Classification (sponsored by Audio Devices) in the 1947-48 Awards. The stations were also asked if they would like to cooperate with SCHOLASTIC MAGAZINES in stimulating interest in script writing in the schools.

Thus far, twenty-nine stations in eighteen states have responded and expressed enthusiasm in the idea. Many of these stations have already contacted the schools in their communities and requested the teachers to encourage their students to enter the Script Writing Competition.

Because of the enthusiasm shown, SCHOLASTIC MAGAZINES have offered these stations an opportunity to actually participate in the program by sponsoring regional contests in their respective areas. Radio scripts would be submitted to the stations themselves for local judging before being forwarded to SCHOLASTIC MAGAZINES for national consideration.

Stations interested in taking part in the Radio Script Writing Awards are urged to write William D. Boutwell, SCHOLASTIC MAGAZINES, 220 East 42nd Street, New York City, for full particulars.

ATTENTION

The Editors of Audio Record welcome contributions from its readers. Any news concerning your recorded programs or other recording activities, that you believe will be read with interest by recordists, can be used. Photographs, drawings, or graphs needed to illustrate your material will be appreciated also. Address all contributions to:—The Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

A NEW IDEA IN REPRODUCING STYLI

As our standards of fidelity improve, new materials and methods become necessary. In disc reproduction this change started first in the professional field, but now even the serious music-lover is anxiously installing the newest in postwar pickups, amplifiers, and loudspeakers. This has prompted the introduction of a new Audiopoint, a sapphire for home reproduction. Perhaps our readers will be interested in some of the factors we considered while investigating the problem.

C. J. LeBel

Quality

Sapphire Audiopoints for the professional have been steady sellers for a number of years. The factors which have made them popular are of interest also to the serious home listener:

A. Tracking distortion is at a minimum because the tip radius can be accurately controlled. The extreme hardness of sapphire (9 on the Moh scale) makes it feasible to lap the radius, with high precision, to a value which will ensure its riding on the straight sides of the groove. As was pointed out by Pierce and Hunt[1] in 1938, this condition is essential to accurate reproduction of the groove contour.

B. The surface noise is reduced by at least several db because of the extremely high polish of the tip. The extreme hardness of sapphire makes it easy to lap the surface to such perfection that a surface character indicator will give no roughness indication at all. While such perfect lapping could be applied to steel, the surface would wear rough again within the first second of use on ordinary phonograph records.

User Requirements

There are two classes of users who would be interested in "permanent" reproducing styli. One group is interested in its ultimate durability, regardless of how badly it may sound toward the end of life. Another group wish to know how long the point may be used before the sound quality is adversely affected, and before the point causes excessive record wear.

Ultimate Durability

When a sapphire stylus is used to reproduce Audiodiscs, no detectable wear results, and the stylus life can be considered indefinitely long. The same is true of pure Vinyl pressings. With ordinary phonograph records, and a pickup operating at about two ounces load, wear is much more rapid, hence the ultimate life is of the order of several thousand playings.

Quality Life

If we measure the sound quality, we find that it begins to deteriorate long before the ultimate life has been reached. While it is true that sapphire is the second hardest material (softer only than diamond), it is certain also that the phonograph record is quite abrasive. Under the pressure of many thousands of pounds to the square inch existing at the tip, the wear is slow but sure, and flats are worn on the end and sides. Long before the time has been reached when the needle will no longer stay in the groove, three things will bother the serious listener:

1. The tip will be worn so flat that poor tracking will result at high frequencies. Sound will be "fuzzy".
2. Scratch will be much worse.
3. Record-wear will be excessive.

Engineering judgment is that fuzzy sound becomes pronounced before the other two factors have deteriorated much. With a typical pickup of today we find that this situation is reached at about 250 to 350 playings. A light weight pickup (1¼ ounce force) would about double the "quality life".

While it can be shown mathematically[2] that a worn stylus will create distortion, experiment shows that the critical listener will be annoyed long before the harmonic distortion meter readings look serious. Intermodulation readings provide a more sensitive indication, but they merely serve to confirm the ear's judgment.[3]

Incidentally, in choosing the tip radius it is essential to have the size such that the point will track part way up the straight side of the groove. The bottom of the groove generally is considerably distorted by polishing of the stamper, and it is wise to be well clear of it.[3] Of course, if the point is too large, it will create excessive tracking distortion, and may even refuse to stay in the groove. A compromise value is therefore desirable.

All of this discussion, of course, presupposes that the pickup is not dropped hard on the disc, nor on the metal turntable-rim. A hard drop is likely to chip the tip, for all hard materials are somewhat brittle. Chipping leaves razor-sharp broken edges, and the point is valueless.

A New Answer

It is evident that the critical listener will find the cost of buying a new stylus, so often, quite appreciable. We have found an answer to this, an answer which the professional has found very satisfactory for many years: resharpening. By using a slightly longer piece of sapphire at the tip, at a very small increase of cost, we leave enough gem exposed so that several resharpenings become possible. A resharpened point of course is as good as new, and will wear as long as the original. Resharpening being much lower in cost than a whole new stylus, the saving in overall operating cost is quite worth while.

Since quality deterioration is gradual, it is easy to overlook the onset of poor sound quality. Hence it is wise to keep a rough count of the number of discs played, and change styli by disc count. In case of doubt another point can be tried, of course.

How About the Diamond?

A possible alternate material would be the diamond, so we will forestall the obvious question. Diamond is the hardest known material, with a hardness of 10 on Moh's scale. Unfortunately, cost goes up faster than durability, so that the cost per disc played is more with diamond than with sapphire. This may easily be understood when we recall that sapphire can be ground and polished with diamond dust — but we have only diamond dust to grind diamond! Accordingly, diamond working goes very slowly, and at high cost.

Interviews With Famous Air Travelers Recorded

Jose Ferrer (right), distinguished stage and screen actor is interviewed by Durward Kirby on the "Wings Over New York" transcribed program over WHN-New York. The program, featuring recorded interviews with leaders in all fields of endeavor who arrive and depart from LaGuardia Field, is presented Monday through Friday from 7:00 to 7:15 P.M. by the New York station. The interviews, which are also heard by transcription over stations in Chicago and Hollywood, are not limited to famous travelers, but include celebrities on hand to bid adieu or welcome to friends and family. The young lady in the center of the picture, who divides her time among the four great runways at the world's busiest airport, arranges the interviews and serves as production aide. Her name: Eileen O'Connell.

Conclusion

In introducing the idea of resharpenable sapphire reproducing styli for home use we believe that we have an idea which is well grounded in both engineering and economics.

References

1. *J. A. Pierce & F. V. Hunt, Distortion in Sound Reproduction from Phonograph Records, J.S.M.P.E., Vol. 31, No. 2, pp 157-186, Aug. 1938.*
2. *B. B. Bauer, Notes on Distortion in Phonograph Reproduction Caused by Needle Wear, J.A.S.A., Vol. 16, No. 4, pp. 246-253, April 1945.*
3. *H. E. Roys, Intermodulation Distortion Analysis as Applied to Disc Recording and Reproducing Equipment, Proc. I.R.E., Vol. 35, No. 10, pp 1149-1152, Oct. 1947.*

Editor's Note: **The reproducing sapphire to which Mr. LeBel refers is the new "Red Circle" Sapphire AUDIOPOINT, now being marketed through AUDIODISC Distributors. This AUDIOPOINT is being produced in both the straight and bent shank types. The straight shank point, #103, is ideal for original recordings and vinyl pressings as well as regular phonograph records — though for phonograph records most users prefer the bent shank, #303.**

An Adelphi student records her voice in a "Fundamentals of Speech" class as classmates critically listen.

Adelphi College Uses Discs in Speech-Drama-Radio Courses

(*Continued from Page 1*)

student is able to detect his errors much more readily than would otherwise be possible."

When a student enrolls in the 'Fundamentals of Speech Course', he cuts a record of his voice at the very beginning. This four-minute recording contains the student's efforts in conversational speech - reading aloud and public speaking. The disc is played back again and again until the instructor knows just exactly what must be done to improve the speech of that individual student. Then, at the end of the course, the student cuts another disc which permits both he and his teacher to thoroughly gauge his progress. "Without question," Mrs. Plugge emphasized, "instruction time is cut in half by the use of recording equipment."

In addition to the 'Fundamentals of Speech' course, Adelphi College also uses recording equipment in their Public Speaking, Drama and Radio courses. For instance, in the Radio Department, recordings are made of every live show rehearsal. So naturally any shortcomings on the part of the actors and actresses are corrected before the show is actually broadcast.

The Adelphi Radio Workshop recently recorded their adaptation of Ernest Hemingway's "The Snows of Kilmajaro", which was broadcast over Radio Station WGGB-Freeport, Long Island. Many other recorded student productions are aired over that station, too.

From time to time many well known recording artists have appeared before the Adelphi radio classes and have given the students valuable tips on building themselves a career in radio.

"Considering the relatively low cost," Mrs. Plugge said, "I would not hesitate to say that all schools, whether they be elementary, high schools, colleges or universities, could profit handsomely in time saved by installing recording equipment in their speech, radio and drama departments."

Audio in AER Script Contest

(*Continued from Page 1*)

Class 4. Non-dramatic scripts for more than one voice (interviews, discussion programs, etc.). 14½ min., or 29½ min. in length.

Special Class. Scripts suitable for home or school recording. Lengths optional, but should be timed in terms of specific record sizes. (2, 3½ and 5½ min playing time preferred.)

RULES AND REGULATIONS

1. Any student regularly enrolled in any recognized college or university in the United States is eligible to participate.
2. Scripts must be typed in radio style (double spaced) and submitted to: AER Radio Script Contest, c/o University of Oklahoma, Norman, Oklahoma.
3. Each script must have a face sheet on which must appear the following:
   a. The title of the script.
   b. The name of the author.
   c. The author's address.
   d. The classification of the script, i.e., 1, 2, 3, 4 or Special.
   e. A statement, signed, that the manuscript is the student's own work; in the case of adaptations, the author and source of the original story must be given. Entries for Special class should also give the name of their teacher. Number each page, but DO NOT PUT AUTHOR'S NAME ON THE PAGES OF THE MANUSCRIPT. Judges will not know the names of the authors
4. All entries, submitted to the above ad address, must be postmarked not later than midnight, March 31, 1948.
5. Regional winners will be notified in April, 1948. National Announcement of National winners will be made in May, 1948.
6. Each entrant retains ownership of his scripts, except for entries in the Special Classification. Contestants are, however, expected to give permission for publication (only) in an issue of one of the educational journals of the educational co-sponsoring organizations of this contest. Copyright on all entries in Special Class become the property of Audio Devices, Inc., New York.
7. Any qualified student writer may enter any or all of the script classifications. However, DO NOT submit more than one script each for Classes 1, 2, 3 and 4.
8. Winning scripts will, where possible, be published in educational journals. Every effort will be made to bring the most promising scripts to the attention of open market buyers. Scripts will be returned to writers only if accompanied by return postage

AWARDS: National*

1st Prize (in classes 1, 2, 3 and 4)..$ 50.00
2nd Prize (in classes 1, 2, 3 and 4).$ 25.00
(Also for *best script* of four regular classes $50.00 plus one set of Encyclopedia Brittanica)
1st Prize (in Special Class).....$100.00
2nd Prize (in Special Class).....$ 60.00
3rd Prize (in Special Class).....$ 40.00
(Also for *each script* suitable for publication in a collection of scripts $25.00)

To Teachers of first, second and third place winners (in Special Class). One box of 25 Audiodiscs, 3 Recording and 3 Playback Sapphire Audiopoints.

AWARDS: Regional*

Eastern Sponsor: Newark News and Radio Station WNJR-Newark, N. J.
Best Script (in classes 1, 2, 3 and 4) $25.00
Southwestern Sponsor: Oklahoman and Times Radio Station WKY Oklahoma City, Okla.
Best Script (in classes 1, 2, 3 and 4) $25.00
Midwestern Sponsor: (not yet named)
Best Script (in classes 1, 2, 3 and 4) $25.00
All Regional winners will be entered for National awards. Scripts from regions without regional sponsor will be entered for National Awards only.

**Additional and/or larger awards nationally, and additional regional awards may be added before the contest closes.*

Further information on the N.R.S.C. may be obtained by writing: Dr. Sherman P. Lawton, AER Script Contest Chairman, University of Oklahoma, Norman, Okla.

Scouts Launch Recorded Series

(*Continued from Page 1*)

that Scout Executives may feature local activities, leadership training courses, community service and other such items.

The talent for the recordings was recruited through AFRA. The organist was Emil Velazco and sound effects were handled by Vic Rubei of CBS. The production was directed by Stephen J. Manookian, formerly Director of Publicity and Special Events at WORL—Boston.

The series covers all phases of Scouting activities and consists of thirteen dramatizations. The first program features the "Good Turn" of the unknown British Boy Scout to an American businessman in London, which resulted in the establishment of the Boy Scouts of America. Other records dramatize actual cases of Boy Scout heroism, Sea Scout rescues, Cub Scout picnics, Air Scout and Explorer Scout projects.

These Boy Scout Transcriptions are a project of the National Public Relations Service of which Leslie C. Stratton is Director. Technical supervision was directed by Irvine H. Millgate, Director of the Visual Education Service of the Boy Scouts of America. Plans for the second series in 1948 are now underway.

audio

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 1 | 444 Madison Avenue, N. Y. C. | January, 1948

Audiotape Development

By William C. Speed, President
AUDIO DEVICES, Inc.

A little over a year ago, Audio Devices, along with several other companies, was invited to Washington by the Dept. of Commerce to examine various pieces of captured German electronic equipment. We were much impressed with the Tonschriber and several rolls of German plastic base magnetic tape.

William C. Speed

Several weeks later, we returned to hear a demonstration by Col. Ranger of the Magnetophone. Samples of tape were made available to us by Mr. E. Webb of the Commerce Dept. Reports from Germany by ear witnesses were so impressive, Audio Devices decided to duplicate and if possible improve on the Magnetophone tape. Our research laboratory, under the direction of Ernest Franck, was instructed to put this study high on its priority list.

Research and development went hand in hand. First, a suitable magnetic oxide had to be produced. Then, a tough, non-tearing, moisture resistant base on which to coat the oxide. Finally, we had to design and build a high quality recorder and reproducer in order to test the results of our experiments.

Exhaustive experimentation on magnetic iron oxide included tests on many hundred samples from our own laboratories as well as from others, tests which included signal to noise checks, distortion measurements and relative frequency response, finally convinced us we had surpassed the Germans in the oxide part of our work.

At present, we are using a vinyl film as the base or support for the oxide dispersion. We chose this material because of its free flowing character; a limp highly flexible tape is essential for proper contact with the magnetic heads. Vinyl is also dimensionally stable in spite of changes in humidity, a state unachieved by paper or acetate. Stretch or shrinkage of as little as ½ of 1% would be ruinous in a half hour of broadcasting. Finally, we chose a film which is highly tear resistant, a property of great importance both for amateur or professional. However any base is at best a compromise and we feel sure that in due

(Continued on Page 3)

In the control room of Fordham University's FM radio station, WFUV, the cast of a school production listen while a student engineer plays back a recording of the program. William A. Coleman (second from left), Chairman of Fordham's Radio Division, is possibly the most ardent listener.

Radio Students at Fordham University Seeking Professional Careers Rely Heavily on Records

Students who hope to make the grade as announcers, actors or producers on Fordham University's FM broadcasting station, WFUV, must come up to professional standards: and the best method of perfecting their talent is a maximum use of recording facilities, according to William A. Coleman, Chairman of the Radio Division, Dept. of Communication Arts.

Common practice in classes such as Voice and Diction at the New York school is to record each student at the beginning of the course and again at the end of the course, at which time the correction of defects and general improvement should be obvious.

Tom O'Brien, NBC staff announcer who teaches Microphone Technique on the Bronx campus, makes continuous use of tape-recording equipment to permit students to hear themselves as they read commercials, attempt tie-in announcements, and render dramatic narrations. When a student is considered of professional calibre and wishes to apply to a commercial station for work after graduation, he is assisted in cutting an audition disc for submission to his prospective employer. Similarly in the course in Acting for Radio, taught by Clayton "Bud" Collyer ("Superman" of the air waves), a particularly good actor or actress will be encouraged to put on a record the characters in which he or she excels.

Ernest Ricca, well-known free-lance Director ("Helen Trent", "Evelyn Winters", etc.), whom Mr. Coleman has teaching the course in Radio Direction and Production at Fordham, is emphatic about the necessity of students hearing their directorial attempts played back. "Until they are proficient enough for air work", he says, "students must work hard at improving. This means a constant process of directing, listening, and learning."

High fidelity RCA recording equipment in the studios of WFUV is augmented by several portable tape recorders and "Educator" type record cutters, the latter restricted principally to classroom use.

Many Fordham programs which would otherwise be impossible are arranged by

(Continued on Page 4)

audio record

VOL. 4, NO. 1 JANUARY, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Writing for Radio

By Jerrold Sandler, Student
NEW YORK UNIVERSITY
New York, N. Y.

There are countless high school and college students who are interested in radio writing. In some schools the student's work has a chance to travel beyond the classroom; unfortunately, this is not the case in many instances.

For the past few years, high school students have had the opportunity to compete for prizes in an annual radio script contest conducted by SCHOLASTIC MAGAZINES. (Audio Devices is acting as co-sponsor of the contest this year). Cash prizes are given for the three best scripts, and commendations given to promising writers. This competition gives the student an outlet for his talents, and a chance to be commended for his efforts.

However, until the present time, the college student has not had the opportunity to partake in similar activities. Now, at last, they are being given their chance. Under the auspices of the Association for Education by Radio, college students in the United States can compete in a national radio script contest. As in the high school contest, several co-sponsors, one of which is Audio Devices, will award cash prizes to the three best written scripts. In addition, a collection of those scripts best adaptable for home and school use, will be put in booklet form, and the writers will be amply rewarded. Speaking as a college student of radio broadcasting, and one who has done some work with educational and professional groups, I believe this contest will be welcomed by the college students.

In writing a radio script, choosing a subject is perhaps one of the most difficult problems. So I will outline here a few suggestions which may prove helpful although these suggestions are in no way to be construed as official.

1. *Original dramas.* In this classification, an endless amount of imagination can be utilized. The world of fantasy, if presented in an intelligent manner, always makes for good radio. On the other hand, the writer can get original ideas from newspapers, magazines, the people he meets, the places he sees, etc.
2. *Adaptations.* Short stories, novels, biographies and plays can be adapted for radio, and can make excellent scripts. Wherever possible, use only those stories or books "in the public domain", i.e. those pieces of literature not under any copyright. (If an adaptation from a copyrighted story is done, and it is reprinted, royalty fees must be paid.)
3. *Programs of local or national interest.* These may include programs to commemorate the birthday of a great American, famous holidays such as Halloween, Thanksgiving, etc., the anniversary of a famous event, or some sports event. The Documentary and "Public Service" dramas are popular forms of presenting the above ideas. These programs of local or national interest could be tied in with the student's work in the classroom e.g. for Washington's Birthday, the student might write a script instead of a composition.
4. Since many of these dramas will be used by schools and home groups, perhaps a short script concerning family life (approximately five minutes long) would make an interesting radio play. Many amusing yarns are ideally suited to script adaptation.

These are some general ideas for prospective radio scripts. There are a few things to guard against. Light scripts have an important place in the contest, since the best scripts will be used by schools, community groups and in homes all over the country. However, that does not mean a serious minded script or well done adaptation or documentary does not also have its place.

In regard to the school presentation of good student scripts, here is some news. In New York City, there is a high school group called "The All-City Radio Workshop" consisting of students interested in radio acting, announcing, writing and production. This group is under the very able guidance of James F. Macandrew and an excellent staff. I was fortunate enough to have worked at their station, WNYE, (The N. Y. Board of Education Station) for about a year and a half. Now, many of the alumni of the Workshop are attending colleges in and around New York. The alumni decided to get together and produce a series on some local non-commercial station. Plans are now being laid for the presentation of last year's prize-winning scripts of the Scholastic competition.

Perhaps in the future the students of this country will help make radio broad casting a regular part of their education. This can be accomplished only if the students take part in projects such as these radio script contests. Writing radio scripts will not do the job by itself, but it certainly plays a major role in Education by Radio.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

MEDIAEVAL CRAFT OR MODERN PROFESSION

Introduction

At the risk of losing half our readers, we are changing from the usual dry technical discussion to the even drearier field of philosophy. The time seems ripe for some philosophizing, albeit only in subminiature doses.

Mediaeval Crafts

C. J. LeBel

In the Middle Ages most technical knowledge was used by craftsmen engaged in the various trades. Organized in tightly closed guilds, these "mysteries" were disclosed only to fellow members and their apprentices. Since craftsmen could not read, transmission of knowledge was verbal. Since guilds were only citywide in scope, general diffusion of knowledge was citywide only. Journeymen traveled from city to city, providing a limited verbal method of further spreading information.

The few engineers then existent could write and draw, of course, but their knowledge was generally acquired verbally, or by personal experiment. Leonardo Da Vinci, a leading military engineer of the next later period (early Renaissance), developed his science by thousands of experiments. There being little incentive for exchange of knowledge, his results were written in private notebooks, fated to be lost in obscurity for hundreds of years.

Mysteries Become Rational Knowledge

With the growth of printing this was all changed. Learned societies became interested in "natural philosophy". Books were written and circulated widely. Secrecy disappeared with the decay of the guilds. With free exchange of knowledge, science and engineering developed rapidly. We had the Industrial Revolution, and thence the Industrial Age of today.

Disc Recording — A Mediaeval Craft

Like other parts of the audio field, disc recording engineering today bears a curious resemblance to a mediaeval craft. It has to be learned verbally, or by personal ex-

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Audiotape Development

(*Continued from Page 1*)

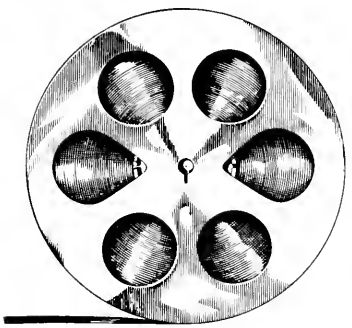
course of time a still better film can be developed which will have all the properties of the best German tape without the disadvantage which apparently they were unable to overcome, i.e., loss of dimensional stability when subject to heat.

Audiotape (trade marked) was chosen as the name for our product and is in our opinion a very proud and suitable companion for Audiodisc. (See cut.)

Audiotape virtually has no surface noise. Under ideal conditions, the signal to noise ratio is something more than 60 db. Equally important is the phenomenally low noise behind signal, probably equal to or superior to the best German efforts.

Frequency response depends on the particular machine used and of course the linear speed of the tape. This is simply to say the "tape" itself has no frequency response. The measurements are relative only, depending upon various factors.

Audiotape, when run at 7½" per second, is substantially flat to 7000 cy. When run at 18" per second, that is at the speed of motion picture film, it is flat to above 9000 cy., and when run at Magnetophone speed of 150 ft. per minute, is flat to above 15,000 cy. which is required for F. M. Broadcasting. These measurements are all about 2000 cycles better than other tape now available.



Audiotape

Distortion measurements are still more difficult to make because every type of tape has a critical bias. Intermodulation tests indicate extraordinary satisfactory results, however more work is still to be done before final figures can be obtained. Nonetheless measurements for harmonic distortion indicate a figure not above ½ of 1%.

Audiotape is being made available in limited quantities for test purposes. However, within a few weeks we expect to be in full production and as in the case of Audiodiscs, distribution will be carried on by our present distributors.

Audiotape is wound in 1275 ft. lengths on lightweight 8" diameter aluminum reels, made especially for Audio Devices, and on 4700 ft. aluminum flanges, 13¼" diameter, adaptable to either Magnetophone or the several variations now coming on the market.

In conclusion, Audiotape will do many things impossible to realize with discs. For editing, assembling, etc., tape has no peer, on the other hand, one must bear in mind the skill, training and ability of the operator is of first importance if the complete benefits of tape work are to be enjoyed. In our opinion, Audiodiscs and Audiotape are natural complements, each will augment and assist the other in bringing fine recording to the home and studio.

R — *Transcription*

By Aaron S. Bloom
Treasurer, Director, Commercial Dept.
KASPER-GORDON, Inc.
Boston, Mass.

The old adage that "you can't teach an old dog new tricks" has been blasted as thoroughly and as effectively as were two Japanese cities by the A-bomb. Many long-time advertisers have discovered the practicability of the transcribed radio program, both custom-built transcription series built specifically for their own use, as well as the open-end syndicated transcribed program series.

The "discovery" was made the hard way, insofar as transcription producers are concerned, for transcription companies found it difficult to educate advertisers on the many advantages the transcription program had and has over the network and regional program—advantages with which no network or regional show could possibly compete. But the radio advertiser knows now, and legion indeed are the number who now use the e. t. program.

For example: can't clear time on a network? So what? Put the show on discs and select the best available time in the markets you wish to cover. What's that? You can't buy a split network? You must buy time in some cities you don't want, or where you have no distribution as yet? Don't let that bother you. Just put the show on discs and select the markets you wish. Then again, must you be saddled with a particular station your dealers just don't feel partial to, but which you must use because it is part of the network? Don't pull your hair out by the roots. Disc the show and buy time on the stations you want.

But then — suppose you don't want to build an expensive custom-tailored show to test a product in a certain market, or group of markets. In that case, there are many good open-end transcribed syndicated shows to use — programs which cost a lot of money to produce, but which the individual sponsor in any market may purchase (lease) to make the test — shows which range from gospel songs to musical variety, from sports programs to mystery drama, from adventure to juvenile fairy stories. There are shows with well-known names which cost the advertiser only a fraction of the expense of a custom-built program—even shows without the so-called "big names", but which have a proven record of success in the building and holding attention of listeners, and in selling merchandise. Actually, many such shows without those "big names" have pulled greater results per dollar of expenditure for time and program, than have some of the more costly "big time" shows with the so-called "stars". The payoff isn't always in the "big name", or even in the ratings. It's in the jingle of the sponsor's cash register. And currently, sponsors are looking more critically at those "ratings". They are finding that the "cost per point" for expensive shows is two, three or even four times as much as for more moderate productions.

Yes — the transcribed show is here to stay — and nothing more need be said to justify the recorded program than to point to the hundreds of sponsors of national importance, and the thousands of regional and local advertisers, who now use transcriptions on radio stations throughout the U. S., Canada, and all foreign countries where commercial programs are accepted.

In many instances, the syndicated transcribed show is an even better "bet" for sponsors to use, than some locally produced "live" talent programs, especially insofar as smaller markets and stations are concerned. Aside from the fact that the syndicated transcribed show costs less, there is usually less worry about the talent available in local markets, production of the show, and certainly no concern about script, rehearsals and timing of the transcribed program. It's all completed! The sponsor knows in advance how the 15th or 50th program in a series will sound, because it's all there on disc for him to hear.

Too, reputable syndicated program producers are as careful of the production that goes into their various packages (as a rule) as are network producers. They have to be. It's their money they are gambling. And they depend upon the success of a series for a sponsor, so that they can sign the same client up for a continuation of the series, its use in other markets, or for another show — whether syndicated or custom-built.

The use of the word "reputable" is not meant to include the "producer" who records two programs as samples, sets out on a selling expedition in the hope of signing enough business to warrant investment in a series of 26, 52, 78 or even 130 or 260 programs in the series. The reputable producer finishes his series before offering it, or has earmarked enough money to complete the number of shows offered, whether one sponsor or 100 signs. The "2-sample producer" who doesn't sign enough individual markets to finance production of the entire series, and therefore never com-

pletes all the programs and therefore never delivers them, generally exits quickly from the syndicated field. But while he is in it, he does it little good. As the oldest syndicated transcribed program producer in the United States (more than 16 years) we have seen them come and go with monotonous regularity.

There's a lot more to this business of syndicated transcriptions than merely producing a series of transcriptions and offering them for sale. The producer must be prepared to make a huge investment, and then take his chances on getting it back. He must know every market in the United States (as well as foreign countries where his programs are adaptable) and how much to expect per program for each market, considering the population, power and rates of radio stations, and cost of production of the program series.

The producer must assist the sponsor in working out promotional campaigns, be ready to supply publicity material, small space ad mats, teaser spots, merchandising and exploitation suggestions. And lots of other things of which there is no space to mention herein.

Be that as it may, the advantages of the transcribed programs — both custom-built and open-end syndicated shows — are making themselves felt more and more. The results as far as the producers and pioneers are concerned may not be as sensational and as sudden as was the atomic bomb. By that I mean that the producer doesn't see his sales and business skyrocket, with wealth rolling in for his efforts overnight. But who wants to break down sales resistance and destroy the customer at the same time? The transcription business has been built step by step — and it's always better to have a solid foundation for anything.

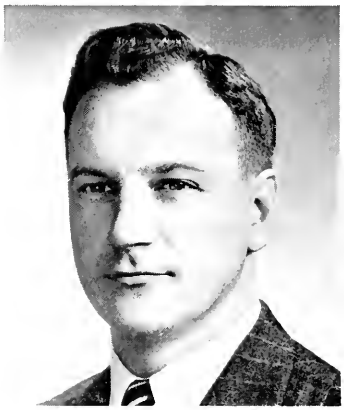
Fordham Station Disc-Minded

(*Continued from Page 1*)

having them recorded at a time convenient to the persons scheduled to broadcast. Thus, Faculty members who might have a conflict between the program, "The Faculty Speaks" and a regular class are permitted to be heard by both audiences simultaneously. In the case of Godfrey Schmidt, "The Story Teller", a busy Industrial lawyer is able to double as a broadcaster of delightful fairy-tales, by the simple expedient of having him record five stories for the week during a single Saturday cutting session. The success of this program was such that WNBC-New York now airs the Attorney-turned Story Teller each Thursday evening.

Finally, by means of recordings, Fordham University's WFUV is taking steps to better international understanding. Under the Rev. Richard F. Grady, S. J., Manager of the station, a series featuring American folk songs with appropriate language commentary is being recorded for distribution to Radio Eire, the French State Radio, and the broadcasting networks of other countries.

"Radio may be only a year old at Fordham," Mr. Coleman says, "but both in classroom and on the air, New York's first Educational FM station is doing a bang-up job . . . on the record."



GOES WEST

Alan H. Bodge, for a year and a half a member of Audio Devices' New York Sales Department, has been appointed manager of the company's new west coast office at 844 Seward Street, Hollywood, Calif. Prior to joining Audio in the spring of 1946, Bodge, a Dartmouth graduate, spent fifty-three months in the radar division of the Army Signal Corp.

Disc Data

(*Continued from Page 2*)

periment, for there is a tremendous gap between written material and actual practice. We have a vast background of acoustic, electroacoustic, and electronic science, but it is not organized into a form usable for audio engineering purposes. Even our colleges pay little attention to the fundamentals of the subject. Much that has been written is either inaccurate or obsolete.

When disc recording began, there was reason for such a situation, for the competent recordists could be counted on the fingers of one hand. It was then an occult art, but that time has long since passed. Now we have more to gain by converting an art into engineering, than by not.

In visiting various recording rooms we see signs of the logical result of present practices. The simplest problem will have scores of solutions — a different one in every recording room. Endless time is spent solving and re-solving the same problems. We need the force of many cooperative minds applied to finding the *best* solution of our common problems.

Converting an Art Into a Profession

A number of steps will be necessary before we have a full fledged profession:

A. We will have to develop the habit of free discussion of common problems.

B. We will have to develop an organization for cooperative attack on common problems.

C. We will *all* have to realize that there is no single magic "secret" which makes recordings marvelously superior. Good recording is the result of the summation of many factors, of taking infinite pains. The magic secret perhaps existed back in the old acoustic recording days, when the art was much more simple, but it is certainly non-existent today.

D. To execute these steps we will have to develop a tradition of general publication. The doctors have made such extensive progress in a much more complex subject only because every new idea is quickly published and studied. The individual contributes only his own single idea, but he gets back in return everyone else's ideas — a yield of a thousand for one.

In the past, general audio publication was badly hindered by lack of a suitable medium. We have had a suitable journal available for several months, and other audio engineers are beginning to write more freely. Disc recordists need to follow the example so set.

E. Still missing is a suitable professional organization to sponsor regular audio engineering meetings, but steps are under way to remedy this.

F. It will also help greatly if publication carries more prestige. Progress in the radio-frequency field has been greatly helped by the fact that publication carries with it improved professional standing. In the more progressive organizations in the audio field this is also true, but in too many places publication is regarded as a laborious chore rather than as an opportunity to make friends in print. It is very pleasant to arrive in a strange city and find that you are not a stranger — for your writings have already made you known.

Editor's Note: Mr. LeBel will be pleased to have recording engineers' comments on the above ideas. What do you think?

ATTENTION
Student Radio Writers

Audio Devices is co-sponsoring the 1948 "Scholastic Writing Awards" (Radio Script Writing Classification), for high school students and also the 1948 AER National Radio Script Contest for college students. Valuable cash prizes are to be awarded writers of best scripts, and supplementary awards will be made to those writers submitting scripts suitable for publication in booklet form. For complete details write: (for high school students) William D. Boutwell, SCHOLASTIC MAGAZINES, 220 East 42nd Street, N. Y. C. (for college students) Dr. S. P. Lawton, AER Script Contest Chairman, U. of Oklahoma, Norman, Okla.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 2 | 444 Madison Avenue, N. Y. C. | February, 1948

On-The-Spot Recordings Integral Part of Regular News Broadcasts at WOR

Listeners Given Quicker Eye-Witness Coverage of Special News Happenings

Equipped with a transcription library valued at half a million dollars and a crack staff of on-the-spot reporters, WOR-New York has perfected the use of transcriptions in news broadcasts to what probably is its most mature development. This development, increased since the war, results in more authentic broadcasts and gives listeners quicker eye-witness coverage of news events.

Larry Pickard, WOR writer, selects a disc from the station's huge file of on-the-spot recordings.

When a news story breaks, such as the search for the missing recluse, Langley Collyer, WOR reporters are sent to the scene wherever practicable to record descriptions of the event which are in turn inserted into regular news broadcasts. Reporter John Wingate, for example, was on hand when Collyer's body was discovered, described the event and raced his recordings back to the station so that WOR listeners might hear a complete story before the newspapers had hit the streets. During recent investigations of the House Committee on unAmerican Affairs WOR newscasts were supplemented with recordings of actual testimony given during the hearings.

The wedding of Princess Elizabeth furnishes another example of the way record

(*Continued on Page 2*)

Don Plunkett, Chief Engineer of Mary Howard Recordings, adjusts one of the mikes in the spacious New York studio while an artist sits at the piano waiting patiently for Mary Howard's cue to begin. Inset: Recording's own, Mary Howard. Photos by Murray Laden and Edward O'Zern

The War Gave Mary Howard Her Big Chance to Make Good in Recording; She Did — And How!

Before the War, many jobs in American industry were considered "man-sized" positions and therefore . . . for men only. But the War and its tremendous drain on manpower soon gave the female a chance to "strut her stuff." And one such lady, who took full advantage of this opportunity to prove that it wasn't strictly a man's world after all, was Miss Mary Howard, daughter of a well-to-do New England family.

Mary Howard had a flair for good music and records particularly intrigued her. To satisfy her curiosity, she bought a recording machine and started on her own trial-and-error course in record cutting. Miss Howard's interest in recording steadily grew — and so did her recording equipment. And then . . .

Mary Howard came to New York in 1940 and immediately applied for an engineer's job at NBC. As girls weren't being hired for that sort of an assignment, Mary Howard had to be content with a secretary's position in the engineering department. Then, her big break came. NBC, losing man after man to the armed forces,

(*Continued on Page 4*)

Tempus Fugit!

Student Radio Writers

Yes, time is flying! Only a few more weeks for you high school and college radio writers to enter one of the two big radio script writing contests. Entries for SCHOLASTIC MAGAZINES' Script Writing Competition (co-sponsored by Audio Devices) for high school students positively must be received before midnight, March 5, 1948. The 1948 National Script Contest, also co-sponsored by Audio Devices and conducted by the Association for Education by Radio, closes March 30. So you haven't much time to win one of the many valuable cash prizes. Act now! For complete contest details write: (for high school students) William D. Boutwell, SCHOLASTIC MAGAZINES, 220 East 42nd Street, N. Y. C. (for college students) Dr. S. P. Lawton, AER Script Contest Chairman, U. of Oklahoma, Norman, Okla.

audio record

VOL. 4, NO. 2 FEBRUARY, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Film actor Pat O'Brien, star of "The Damon Runyon Theatre," and the program's producer-director, Herbert H. Wood, take time out during a rehearsal of the new transcribed NBC Radio-Recording Division feature.

Damon Runyon's Famous Tales To Be Dramatized by NBC in Series of 52 Recorded Shows

Pat O'Brien Star in Runyon Plays

Damon Runyon's internationally famous tales of Broadway will be dramatized in a series of 52 half-hour recorded programs as the result of an exclusive contract between the National Broadcasting Company's Radio-Recording Division and the Runyon Estate, according to C. Lloyd Egner, vice-president of the NBC Radio-Recording Division.

Film actor Pat O'Brien will be the star of the radio plays based on Runyon's stories. O'Brien, who will narrate each play as well as enact the role of "Broadway", will be supported in each program by a radio, stage or screen star.

Commenting on the plan, Egner stated, "We of NBC are proud to be associated with Pat O'Brien and the Damon Runyon Estate in the production of this series of half-hour dramatic programs 'The Damon Runyon'. We consider this a significant step forward in the development of syndicated recorded programming, and our decision to introduce this new dramatic feature culminates months of study and experimentation to produce something completely unique and entertaining in the recorded program field."

The series, which Egner described as the biggest and most expensive syndicated recorded program undertaken by the NBC Radio-Recording Division, will be offered on a syndicated basis for spot advertisers over local stations.

Scripts are being written by Tom Langan, veteran radio author and a Radio-Recording Division staff writer, under direction of Gordon Webber, Radio-Recording continuity chief. H. H. Wood, manager of the division's program department, is producing and directing the series. Special music is composed for "The Damon Runyon Theatre" by John Gart. Ed Herlihy will announce.

On - The - Spot Recordings Integral Part of Regular News Broadcasts at WOR

(*Continued from Page 1*)

ings are used to give listeners better programs. Highlights of the event, which took place too early in the morning for most American audiences, were transcribed, edited and re-broadcast at times more suitable for listeners. Such news coverage has the authenticity of newsreels plus the added advantage of speedy presentation.

Transcriptions also provide a backlog of events and personalities of the past, and the WOR transcription library has on file voices and opinions of almost every national and international leader of the past two decades. When major issues of the past, such as elections or international conferences recur, WOR can summon at a moment's notice, presidents, dictators, generals and a host of others to give their views on the same or similar problems.

Casual interviews with the unpublicized average citizen, as well as with the great and the famed, form a valuable index to public opinion. The reaction of the ordinary voter to national problems is naturally a consistent augury on political trends.

Few places are inaccessible to the radio reporter since the advent of the recorder and WOR has endeavored to make everyday folk the source as well as the consumer of news.

The use of the transcription in news broadcasting gives the listener better news service in spot coverage, a permanent reference of personalities and trends, and on authentic eye-witness account of events presented in a dramatic manner at a convenient time.

ATTENTION

The Editors of Audio Record welcome contributions from its readers. Any news concerning your recorded programs or other recording activities, that you believe will be read with interest by recordists, can be used. Photographs, drawings, or graphs needed to illustrate your material will be appreciated also. Address all contributions to:—The Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

DISTORTION PROBLEMS

Introduction

With the rapid growth of FM radio, and its heavy dependence on records and transcriptions, it is time to reappraise our standards of recording quality. As has been found many times in many parts of the audio field, every time the frequency range of a system is increased, other elements in the performance of the system must be improved also. A wide range system will show up excessive noise and unsuspected distortion in most amazing fashion.

C. J. LeBel

Whereas transcriptions were generally listened to (on the ordinary AM radio receiver) with an upper frequency limit of 4000 to 5000 cycles, on an FM receiver the usual upper frequency limit has been raised to 7000 to 10,000 cycles. Even a few minutes of listening under such conditions will show that pressings are often not as uniform in quality as their makers believe, for distortion varies from one to the next.

Kinds of Distortion

We will disregard the most easily remedied form of distortion — undesired variation of response with frequency. It is so easy to correct with electrical networks that a recordist with an incorrect response curve has only himself to blame.

Harmonic distortion, of course, is the type which the recordist first thinks of when the word "distortion" is mentioned. It has been a much discussed fault, and certainly should be reduced to a minimum before we worry about more elusive forms. The unit to measure the "minimum" by is not easy to define, however. The rss distortion is a widely used index number, but a poor guide to how objectionable the ear will find the sound. Second harmonic distortion is much less annoying than third, and higher orders are almost intolerable in exceedingly small proportion. This anyone can establish for himself in a few experiments.

Many of us have found numerous cases where harmonic distortion figures provided no guide to the annoyance value. One example the writer recalls was an experimental recording on wax, which bloomed one

humid summer while awaiting processing. Another example was the distortion measurement being made on an early experimental lacquer formula. The sound was not quite right, so the pickup pressure was increased slightly. The 1000 cycle tone cleared up immediately — the improvement was rather great — but the distortion meter reading dropped only imperceptibly. As still another example, Roys has shown[1] that the audible distortion created by overpolishing a stamper is not reflected in harmonic readings made on the pressings produced by it.

Nevertheless it is quite certain that if the harmonic content is high, we need look no further to explain why listeners are dissatisfied.

If the harmonics are low in value, we may still dislike the sound. In that case the next step would be a measurement of the intermodulation distortion. Whereas harmonic measurement is made with a single input tone, intermodulation testing is a measurement of combination tones produced by injecting a pair of frequencies. This method was first made standard in the film recording field.

We have deliberately omitted any discussion of transient distortion for lack of space. It is a fault not to be ignored, but certainly the industry needs to go further in minimizing better known defects before it worries too much about transient effects.

Intermodulation Tests

Intermodulation distortion provides a good explanation of why some recording systems are clean sounding with a single instrument, but fuzz up hopelessly with a full orchestra. Each tone acquires such a multiplicity of sidebands that definition is lost.

The usual test method is to introduce a low frequency tone and a medium or high frequency. Amplitude of the two may be equal, or they may be in a 4:1 ratio. A commercial unit uses 40, 60 or 100 cycles, and 2000, 7000 or 12,000 cycles. Another commercial unit uses these or other tones. Roys' principal work has been done with 400 and 4000 cycles.

Intermodulation Results

There has been little published work on intermodulation results. Hilliard[2,3] has very briefly suggested amplifier reproportioning.

On discs themselves, Roys' work[1] on the effect of overpolishing stampers is of great importance. No other data on disc system or processing characteristics has been published, but unpublished data on a number of the best systems presently in operation show low intermodulation as measured on the lacquer. This is not necessarily true of all systems, nor of all lacquers.

Unpublished measurements by a number of organizations on the effect of processing seem to indicate it as the worst source of trouble. If we are to turn out transcriptions of consistent top quality, some species of control should be adopted. Overpolishing has been condemned for at least a generation, but it still continues.

Remedies

It has already been proposed that every master contain a few intermodulation test grooves. These could be used to check every pressing, and thereby the stamper wear. This proposal would certainly eliminate the accidental use of worn out stampers. It would not be a perfect check for overpolishing, as the processor would simply be more careful in the vicinity of the test grooves!

As a supplementary means, it has been suggested that a test pressing from each stamper be sectioned, polished, and measured under the microscope. There is a certain amount of change of groove radius due to compression of the metal of the stamper, but any excess amount would immediately indicate overpolishing. Certainly, some such means will have to be adopted to narrow the quality difference between the lacquer original and the pressing.

References

1. *H. E. ROYS, Intermodulation Distortion Analysis as Applied to Disc Recording and Reproducing Equipment, Proc. I.R.E., vol. 35, no. 10, pp. 1149-1152, October 1947.*
2. *J. K. HILLIARD, Intermodulation Tests for Comparison of Beam and Triode Tubes Used to Drive Loudspeakers, Communications, vol. 26, no. 2, pp. 15-17, 54, February 1946.*
3. *J. K. HILLIARD, Distortion Tests by the Intermodulation Method, Proc. I.R.E., vol. 29, no. 12, pp. 614-620, December 1941.*

In the speech training class at Concordia Seminary (Lutheran Church), St. Louis, Mo., a future minister speaks from a make-believe rostrum while a second student records the voice. Such recordings are made at the beginning and again at the end of each academic year in order that instructors might accurately gauge the student's speech improvement.

St. Louis Seminary Uses Recording Equipment To Better Student's Speech

Discs Aid Future Ministers in Overcoming Various Speech Difficulties

The chief objectives in speech training at Concordia Seminary (Lutheran Church) in St. Louis, Mo., are to free the students from self-consciousness and performance-reflexes, to equip them for direct speech from rostrum and microphone, and to overcome bilingual patterns incurred through previous environment. Such was the recent explanation of R. R. Caemmerer, Director of Speech at the Missouri seminary.

When asked to explain just how recording equipment is used at Concordia, Mr. Caemmerer replied: "Each student makes a recording of selected readings, from three to five minutes in length, near the beginning of each academic year. After an instructor has analyzed this recording privately with the student, pointing out special problems to be overcome, the student begins a series of clinical practice periods.

"In this speech clinic," Mr. Caemmerer said, "the student endeavors to remedy problems classified under bilingualism, vocal quality, reflection and interpretation, rate and phrasing. (The therapy is carried out largely by means of the wire recorder.)

"Then toward the end of each year the students make a recording, in pairs, of an extemporaneous conversation. This recording," Mr. Caemmerer added, "is analyzed with the students to point out gains achieved through the therapy or through a less self-conscious situation."

The speech director also explained that full length recordings are made of projects in radio evangelism and radio dramatics by the seminary's own radio station, KFUO, located on the St. Louis campus.

War Gave Mary Howard Chance to Make Good in Recording; She Did

(*Continued from Page 1*)

decided the comely secretary deserved a chance to cut a disc and be paid for doing it. Mary was a big leaguer from the start and in no time at all, the trade looked on her as a master recording engineer.

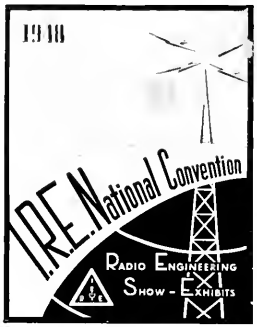
Her work at NBC gave Mary Howard ideas — big ideas of opening her own recording studio. And just to prove she wasn't day dreaming, Mary Howard invites you to visit her studio (Mary Howard Recordings) at 37 East 49th Street in New York any day you wish.

Since Miss Howard set up her own "shop", a little over two years ago, many of the biggest names in radio have used her facilities. Such outstanding personalities as Alex Templeton, Eddie Duchin, Ethel Waters, Fred Waring, and many others, have come to Mary Howard Recordings because they knew that this Howard woman, when it came to making recordings, was "perfection on parade."

Mary Howard Recordings functions primarily as a recording service and its operations, besides cutting instantaneous masters, includes line and air checks of all descriptions, studio recording and slidefilm work. In the last year Mary Howard Recordings released their own commercial records. The Herman Chittison Trio, Ethel Waters, Lucille Turner and Dale Belmont are a few of the artists who made recordings under the MHR label. And, like the thousands of other recording companies, Mary Howard Recordings is waiting patiently for the Petrillo ban to be lifted so they can 'get going' again.

Cutting equipment in Mary Howard Recordings, according to Chief Engineer Don Plunkett, Mary Howard's able assistant, consists of: Van Eps and Allied Cutting Lathes, Presto 1-D Heads driven by Langevin 101-A Amplifiers. "Our mixing equipment," Mr. Plunkett explained, "is interchangeable by means of patching. Our Preamps and Our Program Amps are Langevin. Re-recording equipment at MHR," Mr. Plunkett said, "consists of Allied Transcription Tables and Pickering Reproducing Equipment, which have served us most efficiently of all pickups we have tried. This combination—Allied TT's and Pickering Pickups—we find the most flexible for composite recording."

Audio Record asked both Miss Howard and Mr. Plunkett what their particular techniques were—what they did to insure good recordings. To this query, Miss Howard replied: "We are of the opinion that a compact, consolidated recording and control room, combined adjacent to and visible to the studio is the best method of recording. With this setup a recording technician can actually 'ride gain' but what is more important can see what actual level is imposed on the disc. We feel," Miss Howard continued, "that the term 'riding gain' is a poor description of the operation involved. The more dynamics achieved in a fidelity recording, even if the frequency response is limited, the more the sound originating in the studio will be approximated. We feel that too much emphasis can be put on the word 'fidelity' and that some of the pre-emphasized and over emphasized high frequencies often result in a sound unpleasant to the ear, which after all is the final judge."



Pictured above is the official label of the 1948 National Convention and Show of the Institute of Radio Engineers which will be held in New York's Grand Central Palace and Hotel Commodore, March 22 through March 25. Audio Devices will display its products in Booth #233.

"Dynamic fidelity of course," Mr. Plunkett hastened to add, "is closely allied with surface noise and care must be taken with selection of styli and discs so that low level passages will not be marred by surface noise.

"And then too," the chief engineer went on, "recording quality must be checked constantly and the best check is immediate playback. This is, unfortunately, quite often ignored by many studios, or discouraged by companies as a waste of time."

"Yes, and," Miss Howard, eager to get back into the discussion added, "recording information about cutting characteristics, recording head designs, styli and quality of response equipment is easily obtained. These all enter into the final results. Unfortunately, the interest and ingenuity of the recordist has often been overlooked. Recording," she continued, "is not a dull craft at all if engaged in all its technical phases. There seems to be a prevalence in large organizations for specialization — cutting technicians, studio technicians, maintenance, etc. — which often results in poor recording because of lack of interest or information in all phases of the recording operation. If interest and enthusiasm were carried all the way through the recording organization, and management, perhaps time might be found to raise the general recording standards in America.

"We have tried," she concluded, "to incorporate these methods (?) in our operation and have had success . . . or some such thing."

From what Audio Record has been able to learn, that 'some such thing,' Miss Howard refers to, spells success all right . . . and with a capital 'S'.

"The following program was transcribed from an earlier broadcast in order that you might hear it at this more convenient time"

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 3 | 444 Madison Avenue, N. Y. C. | March, 1948

Audio's Research Department Vital To Company's Success

Research Director Franck Introduces Staff to Audio Record Readers

It wasn't long after the first Audiodiscs were made, back in the late thirties, that Audio Devices realized the importance of, and the need for, a fully-equipped and fully-staffed Research Department. "To progress, one must explore" was the philosophy of William Speed, Audio's president, and soon the young company was laying plans for what is now, possibly, the most modern, up-to-the-minute research department in the recording disc field.

One of the very first steps in creating such a department in any company, of course, is the hiring of an outstanding man who not only possesses the ability to delve deep into the unknown qualities of your product and its competitors, but a man who can mold together a fine staff of capable and creative assistants who will work as a "team" to further the progress of your organization. The Research Director that Audio Devices engaged to set up their Research Department had all of these qualifications . . . and more.

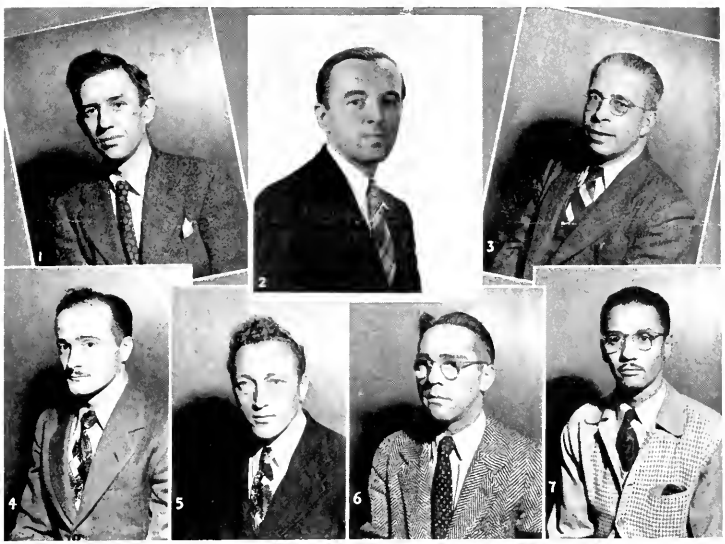
Ernest W. Franck was Audio's man. And Ernest W. Franck has justified his company's choice time and time again. Ernie Franck has been a well-known figure in the sound recording field since almost its infancy. Considered an authority on the art, he is not only a demon for work but an inspiration to others working with him. Ernie Franck is not a desk executive, not by any means. He is "right in there" with the boys on every project, on every problem.

Besides his vast knowledge of discs, their components, etc., Audio's Research Director, it is safe to say, knows as much, or more, about magnetic recording tape as any man in the country. Actively engaged at the present time in furthering Audio's development work with Audiotape, Mr. Franck spends countless hours exploring into the possibilities of this new sound recording medium.

In assembling his staff of chemists, technicians and so on, Mr. Franck has taken time to "be sure" in his selections. Each time an addition was made, the "Franck Stamp of Approval" usually guaranteed a sound and profitable investment to Audio Devices. Believing in the theory that only "interested" workers make good researchers, Ernest Franck is justly proud of his

(Continued on Page 4)

AUDIO DEVICES' RESEARCH STAFF



Above 1. Harold J. (Andy) Southcomb, Pressings Expert; 2. Ernest W. Franck, Research Director; 3. George M. Sutheim, Chief Chemist; 4. Stephen Schettini, Department's "Gadgeteer"; 5. Frank Radocy, Production Analysis; 6. David S. Gibson, Lacquer Specialist; 7. Allison B. Randolph, Radio Technician.

Tape and Disc Recorder Prize Assets in Saint Frances College's Speech Training Department

Speech has been a *required course* at Saint Frances College, Brooklyn, New York since 1920. As William T. Howle, Professor of Speech at the New York school puts it: "Speech is a *tradition* at Saint Frances".

When asked what part recording equipment played in Saint Frances' speech training program, Professor Howle replied: "We use both disc and tape recording equipment and to say that they haven't been priceless assets to the Speech Department would be like saying that this country had nothing to do with winning the war. We are *sold* on the recording medium and believe it deserves much of the credit in improving and perfecting speech."

The Catholic college offers five speech courses—Voice and Diction, Extemporaneous Speaking, Oral Interpretation, Discussion and Debate and Pedagogical Speech. (The first two courses are required study for graduation.) In the required courses the student makes a disc recording of his voice at the beginning and again at the end of the school term for comparison and study. For everyday classroom recording a magnetic tape recorder is used.

(Continued on Page 3)

Big Radio Script Writing Contests End This Month

Scholastic Script Writing Awards — National Script Contest Close Soon

SCHOLASTIC MAGAZINE'S Script Writing Competition (co-sponsored by Audio Devices) for high school students and the 1948 National Script Contest (also co-sponsored by Audio Devices), conducted by the Association for Education by Radio for college students, close this month.

Widespread interest in these national contests is evidenced in the tremendous volume of mail arriving at both SCHOLASTIC and AER Contest Headquarters. Script after script are pouring in from all parts of the United States.

According to William D. Boutwell of SCHOLASTIC MAGAZINES, scripts

(Continued on Page 3)

audio record

VOL. 4, No. 3 MARCH, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

I. R. E. Show Opens March 22; 10,000 Engineers To Attend

Record Number of Radio Engineering Exhibits; 183 Firms to Participate

Tremendous interest in "Radio-Electronic Frontiers", which is the timely theme of the 1948 I.R.E. National Convention, is proven by the vigorous increases in both numbers of exhibitors in the Radio Engineering Show, and the space taken in three floors of Grand Central Palace's huge exhibition area. The Show opens Monday, March 22nd, and runs four days through March 25th.

One hundred eighty-three of the headline firms of radio and electronics are participating in the Show with displays ranging from single booths to areas large enough to duplicate an entire transmitting studio. The latest developments in instruments, components and complete transmitters will be shown. Every phase of electronics and communication equipment, and some of the latest methods of aircraft guidance will be presented to the 10,000 radio engineers coming to the convention from every part of North America. For the first time, 22 exhibits will be placed on the third floor, adjacent to session halls for technical papers. Exhibit space is 30% ahead of 1947.

More than 120 technical papers, skillfully organized in 28 related sessions will comprise the lecture program of the convention. Three social events, a cocktail party, Monday; the popular President's Luncheon on Tuesday, and the Annual I.R.E. Banquet on Wednesday Evenings add color to what has grown to be one of the world's greatest assembly of engineers.

Audio Devices will display its products in Booth #233.

"Whodunit" on Record

In Michael Curtiz's latest mystery thriller, "The Unsuspected", Claude Rains, the unsuspected villain in the Warner Bros. release, employs the services of 16" recording discs to blackmail fellow actors and to divert suspicion that he himself might be guilty of committing the photoplays' murders. The "perfect crimes" fail when Rains' recording activities are discovered.

Covering Four Special Events In Two Hours Time No Problem To Alert California Station

Thanks to the ingenuity of staff members, plus recording equipment, the task of covering four community-interest special events from four different spots all within a little more than two hours time was performed recently by KBLF-Red Bluff, California.

KBLF's problem was to cover (1) ceremonies at the Business and Professional Women's meeting, celebrating the centennial of the discovery of gold in California; (2) a basketball game; (3) a presentation of medals to veterans of World War II; and (4) a March of Dimes Skating Party. Here's how the California station did it:

KBLF's station manager, Bill Murphy, emceed the Women's broadcast, and after introducing the main speaker of the evening, Murphy left the banquet room to go to the next broadcast — a basketball game. When he arrived at the gym, the broadcast was already on the air with the station's play-by-play announcer at the mike. Murphy did the "color" between the quarters giving his cohort time to wipe his brow.

In the meantime, KBLF's commercial manager, Wayne Thorton, Jr., was at the city's Veteran's Memorial Hall, recording the presentation of Victory and American Defense Medals to World War II vets. Thorton, recorded speeches by various dignataries as well as interviews with the recipients of the medals. This program was aired the following evening.

And twenty miles away, announcer Sherman Guill, with a recorder, covered the March of Dimes Skating Party in Los Molinos. The program mainly musical, plus interviews with the March of Dimes officials, was broadcast the next afternoon.

The box score for the night: four community service special events. The time: two hours and twenty minutes.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

PHONOGRAPH RECORD MANUFACTURE

Recent correspondence has made it apparent that many of our readers are not in touch with phonograph record manufacturing methods of today, but would like to know more about the subject. We will sketch a typical procedure, without attempting to cover every possible variation. It will be found that the durability and permanence of lacquer recordings have permitted many changes from methods of the old wax days. The NAB standard terminology[1] will be used where it fits in.

C. J. LeBel

Lacquer Original

The selection is recorded by usual methods on a lacquer disc. This is often done on a 16" blank so that several takes may be recorded on a single disc.

Fig. 1 Cross-section of lacquer original

Lacquer Mother

The best take is selected for processing. This take is re-recorded by conventional methods on to the correct size master disc for the pressing to be made: 12" for a 10" pressing, 13¼" for a 12" pressing. The eccentric circle common to most phonograph records must also be cut. The final result is known as a *lacquer mother.*

Fig. 2 Cross-section of lacquer mother

Processing

The lacquer surface is coated with a conductive film of metal by either chemical deposition of silver (*silvering*) or by electrical discharge deposition of gold in vacuum (*gold sputtering*). A very difficult problem which we had to solve in formulating our lacquer was to make it take silvering and sputtering with consistently

good quality. A heavy layer of copper is plated on top of the conductive layer by conventional electroplating procedure. The result, stripped off the mother by mechanical means, is known as a *shell stamper,* and if attached to a heavy sheet of backing material becomes a *backed stamper.*

Fig. 3 Cross-section of stamper

The stamper center hole is bored out concentric with the grooves, the rim is trimmed to size (removing the oversize portion, often marked by plating clamps), and it is then ready to be used. In many cases it may be given a flash layer of chromium to enable it to better withstand the wear and tear of use.

A lacquer mother may be coated, electroplated, and stripped several times, producing an equal number of stampers.

One operation can seriously injure quality: polishing. It has been claimed that the dirt adhering to a stamper may be removed by a high pressure jet of clean air, but it has been customary to use more drastic means. Emory Cook has shown that even a heavy rub with a rag is enough to polish off all traces of 25 kc. H. E. Roys has shown[2] that overpolishing can introduce serious intermodulation distortion. In any case, there has been steady disagreement between recording room and processing department on the tendency to overpolish, for many years.

Pressing

The stamper is then fastened to a record die on one platen of a molding press, and another platen is fastened to a record die on the other platen. Labels are placed at the centers. Steam is passed through the record dies, a hot *biscuit* of pressing stock is placed on the lower stamper, and the platens are closed under pressure. Shortly thereafter the flow of steam is cut off and cold water is circulated thru the dies. When the disc is cool and hard, the press is opened and the *pressing* is removed. The edge is trimmed and the record is then ready for shipment.

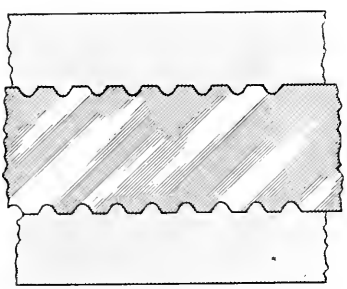


Fig. 4 Pressing action of stampers

During a classroom recording session in one of Saint Frances College's speech courses, a student speaks into a microphone while a magnetic tape recorder records his voice. Fellow classmates at the Brooklyn, New York school listen eagerly with their instructor for possible flaws in delivery.

Tape-Disc Recorder Aids College

(*Continued from Page 1*)

Saint Frances is the only Catholic college offering the Pedagogical Speech course in the New York Metropolitan area. This intensive course for future teachers is designed to qualify students to meet the requirements of the highest standards. Special emphasis is given to the requirements of the New York City Board of Education.

Aside from the compulsory speech courses at Saint Frances every student who enters the Brooklyn school must take a speech screening test to determine if he has any speech defects. (This is an oral examination and does not involve the use of recording equipment.) If it is found that the student does have speech difficulties he is assigned to what is known at Saint Frances as the 'speech clinic'.

Under the direction of Ray H. Abel, the speech clinic, modeled after the clinic at the New York Post Graduate Medical School and Hospital, helps the student to overcome his speech weaknesses by having him record his voice time and time again so that he can hear and have analyzed his own errors. The tape recorder is employed for this recording operation. Professor Howle humorously refers to the speech clinic as a "remedial course for Brooklyn provincialism".

A further use of recording equipment at Saint Frances is by the school debating team. A member of the New York State Debate Conference, Saint Frances records all of their debates on standard 16" discs.

Comment

The interesting thing to note is that the process of going from the original recording to the mother is done electronically rather than electrochemically. The saving in time, if enough mothers are needed, may amount to several days.

References

1. *GLOSSARY OF DISC RECORDING TERMS, Audio Record Feb., March, May, June, July 1946.*
2. *H. E. ROYS, Intermodulation Analysis as Applied to Disc Recording and Reproducing Equipment, Proc. I.R.E., vol. 35, no. 10, pp. 1149-1152, October 1947.*

Script Writing Contests Close

(*Continued from Page 1*)

have also been received from regional winners in such major centers of school radio activity as Detroit, St. Louis, Pittsburgh, Hartford and Birmingham. (According to contest rules regional winners are also eligible for prizes in national competition.)

Mr. Boutwell also confides that 1948 will far outshadow last year in total entries. He believes that this is due to two factors; wider publicity for the competition (we hope Audio Record helped) and the rapid growth of high school radio workshops. "Every day," he says, "brings news of an additional high school radio workshop.

Dr. Sherman P. Lawton, AER Script Contest Chairman, also reports that student interest in the National Script Contest is far greater than anything he had expected. And, although this is the first year such a contest has been conducted for college students, Dr. Lawton advises that he is more than satisfied with the results.

Contest winners in both the SCHOLASTIC and AER competition will be announced in the May Audio Record.

George M. Sutheim, Chief Chemist, at work in Audio Devices' Research Laboratory.

Research at Audio Devices

(*Continued from Page 1*)

six man staff. Ernie would like Audio Record readers to know these men, so we take pleasure in introducing them here. . . .

George M. Sutheim (#3 in photos — Pg. 1). Mr. Sutheim is Chief Chemist at Audio. A graduate (Chemical Engineering) of the Institute of Technology in Vienna, he is a chemist of long standing in the field of varnishes, lacquers and emulsions. From a chemical standpoint, Mr. Sutheim rigidly controls the components that go into each and every Audiodisc. Improved formulation of Audiodisc coating is always on his agenda. Authored "The Introduction of Emulsions" and contributed to Dr. J. J. Mattiello's "Protective and Decorative Coating". Also author of many articles on coatings and film, etc. in both French and English periodicals.

Harold J. (Andy) Southcomb (#1 in photos) Andy (as he is affectionately known to his co-workers) Southcomb's contribution to Audio Research is his wealth of knowledge of phonograph records, materials, techniques, etc. Formerly with RCA Victor and Decca Records, Mr. Southcomb is currently working on special products at Audio, including magnetic tape, etc. His experience in the field of paper, plastics and adhesives makes him a particularly valuable man in this development work.

Stephen Schettini (#4). Steve Schettini, it can be said, would be lost without the Research Department gang, but not half as lost as they would be without him. For Steve carries a mighty big load for Ernest Franck and Company. You might, and you should, call him an experimental machinist and technician. Mr. Schettini is responsible for the construction of special equipment used in the department's experimental work. Steve has the ability to interpret someone's idea and put it into a physical reality. For example, if the Research Director wants to test a particular material and needs a special device to accomplish this end, Steve retires to his special workshop and designs and builds the contraption. Also, Mr. Schettini has been involved with the magnetic tape development.

Frank Radocy (#5). Former Captain in the Army Air Corp., Frank Radocy is in charge of the department's production activities. Responsible for lacquer formulation on production basis. Frank makes up special formulation cards on a batch-by-batch basis. Also, he is doing magnetic tape production, being responsible for individual cards on each tape lacquer batch and the mechanical operations necessary for them.

David S. Gibson (#6). Thirty one year old Dave Gibson is a recording lacquer specialist. His work in the department, besides lacquer experimental formulation and quality control, includes styli and groove shape studies as well as special development work. In the recording lacquer end, Dave in addition to testing the lacquer coated discs on a turntable, also makes humidity tests to determine how well the lacquer holds up under varying temperatures and humidity. In these recording tests both styli and grooves sections are examined with a special projection microscope which magnifies five hundred times. Additional playing tests are also made for surface noise and wear.

Allison B. Randolph (#7). A radio technician, Mr. Randolph has had a number of years experience in the technical end of radio. He is the maintenance man on all electronic equipment in the laboratory.

That's it. That's Ernest Franck's Research Department line-up. And a qualified crew it is, too.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 4 | 444 Madison Avenue, N. Y. C. | April, 1948

Recordings . . . and How They Help The Red Cross

By Ray Richmond

Pancake flour and pancake make-up, Ronald Colman, horoscopes, the California Chamber of Commerce, and cough drops bestow their largest of entertainment and education on the American public by transcription every day. What better way to reach the people? None. Then why not instruct concerning humanitarianism in the same tried and true way? Red Cross does. And who but Red Cross has its finger closer to the pulse of the populace? No other; not even the Gallop Poll.

Always needed, always there, the National Red Cross is asking for 15 million dollars more this year than last. Remember the Texas City disaster; the floods in the Midwestern States; and the forest fires in New England? Not counting the hundreds of smaller calamities that never hit the front pages. Millions of victims were cared for, and this kind of Brotherhood costs money. Hard working, honestly devoted volunteers are only biped. They can reach but a small group of us. Radio reaches more people more easily.

To appeal to this large audience for the Red Cross 1948 Fund, six 15 minute capsule versions of top network radio shows were prepared on discs in the format of their regular weekly features. These shows star Bob Hope, Bing Crosby, Dick Haymes, Frank Sinatra, Jack Benny and Kay Kyser, but they include "Red Cross Commercials" as inserts instead of the usual sponsor plugs. During March, the traditional Red Cross Month, these recordings were played on more than 1,000 stations in the United States.

Also, four-and-a-half minute dramatized spots featuring screen stars Ella Raines, Robert Montgomery and William Bendix will be heard during the 1948 Fund Drive with eight 45-second straight announcements by Hollywood "name" announcers on the reverse side of these two-sided transcriptions.

There is still another use for Red Cross recordings. Mutual Broadcasting System used a portable recorder to record the inaugural Manhattan campaign luncheon at the Waldorf-Astoria in New York on February 13, at which Bop Hope was one of the principle speakers. To the listening audience that night, the network played back a part of the Hope speech on its Radio Newsreel program.

(Continued on Page 4)

Irv Kaufman (back to camera), one of Nola Studios two chief engineers, is pictured at the controls during a recording session in the New York firm's spacious Broadway studios. Such outstanding "name" bands as Bob Crosby, Art Mooney, Xavier Cugat and Benny Goodman have used Nola's recording and rehearsal facilities. Inset: Owner and founder of Nola Studios, Vincent Nola.

Vincent Nola's 20,000 Sq. Ft. Studio Largest In U. S.; Top "Name" Bands Use Its Facilities

Several months ago, Audio Record ran a story on the operations of, what its owner claimed to be, "the *smallest* recording studio in the United States" (after viewing a photograph of the establishment it was impossible to dispute this gentleman's word). So now, we believe it only fitting, that we feature an article on the *largest* recording studio (under one roof) in this country.

This distinction belongs to Nola Studios, located at 1657 Broadway in New York City, where some forty orchestras have been known to rehearse and record during a twenty four hour period. The fourteen individual studios that comprises Nola Studios covers an area of 20,000 square feet.

Nola Studios is owned and operated by one of the true pioneers in the recording field, Vincent Nola. Vincent Nola was born in Sicily in 1895 and 10 years later, with his family, moved to the United States and to a home in Buffalo, New York. It was in Buffalo that Vincent got his start in the musical world. With pennies saved from a

(Continued on Page 4)

ABC's Daylight Saving Time Plan To Start On April 25

Net To Use Tape Recorder For DST Operations; Lower Costs — Improved Program Fidelity Is Anticipated

A noticeable improvement in quality of rebroadcast programs and a substantial reduction in costs to its affiliated stations is anticipated when the American Broadcasting Company sets in motion its vast plan for Daylight Saving Time Operations on Sunday, April 25.

Operating only during the 22 weeks of Daylight Saving Time, the plan which ABC initiated in 1946 and expanded last year to the network's full program sched-

(Continued on Page 2)

audio record

VOL. 4, No. 4 APRIL, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

ABC's Daylight Saving Time Plan to Start on April 25

(*Continued from Page 1*)

ule, through the use of special broadcast lines and recordings maintains all ABC programs in all time zones at the same time the year round.

Improved program quality and lower costs to ABC affiliates stem from the fact that the web this year plans to use Ampex Electric Corporation's tape recording machines to record its entire program schedule for playback directly from the tape. The machines are based on designs and specifications prepared by ABC engineers. The machines also are expected to be used year-round for all regional repeat broadcasts by the American network.

This will mark the first time in radio history that a network program has been rebroadcast directly from a recording tape. Heretofor, programs that have been recorded on tape were transferred to recording discs and then broadcast. ABC, during the past two years that it has been using its special plan of Daylight Saving Time operations, has utilized disc recordings to play broadcasts back at their accustomed time to local audiences.

Based on engineering tests conducted earlier this year, which indicate a noticeable improvement in program quality and tone fidelity through use of the Ampex tape recorders, ABC has placed an initial order for 12 of the machines and delivery is expected shortly.

Savings anticipated by ABC from lower operating costs through use of tape recorders and the direct play-back of programs from these machines will be passed along to the networks affiliated stations which share in the cost of the Daylight Saving Time plan.

Basic mechanics of ABC's Daylight Saving Time plan of operations, developed by the network through the cooperation of its clients and affiliated stations involves the acquisition of special broadcast lines by ABC. Through the use of these special broadcast lines, programs are broadcast live to ABC stations operating on Daylight Saving Time and recorded in Chicago and Hollywood for rebroadcast one hour later for stations operating on Standard Time.

The recorded plan is used only on ABC's regularly scheduled programs. Special events, such as a Presidential speech, a major prize fight or the coverage of conventions, etc., will be heard at the time they take place.

SCRIPT CONTEST WINNERS TO BE ANNOUNCED IN MAY

Winners in SCHOLASTIC MAGAZINE's Script Writing Competition (sponsored by Audio Devices) for high school students and the 1948 National Script Contest (co-sponsored by Audio Devices), conducted by the Association for Education by Radio, for college students, will be announced in the May issue of Audio Record.

The four national winners of the recently concluded "Voice of Democracy" contest, sponsored by the U. S. Junior Chamber of Commerce, the National Association of Broadcasters, and the Radio Manufacturers Association, are congratulated by Attorney General Tom C. Clark in his Washington office. In the capitol city for a four-day tour and entertainment, which, in addition to $500 scholarship awards, was part of their prize, the four high school girls are: left to right — Rose Allen Mudd, Missoula, Mont.; Janet Geister, Cuyahoga Falls, Ohio; Laura Shatto, Hagerstown, Md.; and Alice Wade Tyree, Lawton, Okla. The contest the girls won with their broadcast on "I Speak for Democracy" was entered by more than 20,000 students in 39 states and Alaska. Before the national winners were decided each individual state selected their own champion by having the outstanding contestants record their addresses on discs and from these recordings a state winner was determined. Then, recording discs came into play again when the national winners were judged in Washington. All in all some 500 discs were used nationally in the contest.

disc-data for the Recordist

By C. J. LeBel, Vice President AUDIO DEVICES, Inc.

DISC and TAPE

We have had a large number of inquiries on the comparative merits of disc and magnetic recording for professional use, and, since we make media for both methods, a preliminary survey has seemed desirable. Unfortunately, at the present stage of the art the answer seems to be more in terms of the associated equipment's limitations than that of the medium itself.

Physical Differences

Tape is easy to edit with scissors and a roll of adhesive tape. This is one of the reasons why it has replaced wire for professional magnetic recording, for wire splicing is neither convenient nor durable. For example, for shortening the record of a political convention from eight hours down to thirty minutes there is nothing as good as tape.

C. J. LeBel

Tape can be erased and reused, and for the programs incident to daylight saving time adjustments, programs mainly of transitory value, this is a real feature. Programs can be "assembled" on tape.

Recording on tape requires less mechanical skill than does disc, for there are no styli to wear out and replace. Editing requires *very great skill*. On the other hand, magnetic recording heads wear and lose quality — so that head wear tests and replacements become necessary.

In reproducing, the mechanical skill for disc is negligible, but tape requires care and attention for correct threading in many machines. Tape may break in starting, and splices may pull apart in reproducing or rewinding. Such a failure may create a veritable "bird's nest", and if during reproduction can ruin a program. This may be one reason why the BBC for years has rerecorded from tape onto disc for program use.

The factors governing the durability of lacquer discs are well understood. Lacquer will be comfortable under any condition where a man will be normally comfortable. However, little is known about tape, particularly under exacting professional standards of performance. Severe dropping,

heavy vibration, or exposure to strong magnetic fields can cause erasure, noise and distortion increase. Magnetic fields are invisible, and not noticed unless strong enough to affect a watch. All magnets lose magnetization strength with time, and so we would expect tape recordings to change with time. Whether they will simply grow weaker, or whether the strongly magnetized portion will fade faster than the weakly magnetized (producing distortion) is something that no one can presently answer with certainty. It must also be remembered that scratching of the tape will deform the coating, and hence create distortion. Conditions affecting the base material are not too perfectly understood, either. Shrinkage due to age or atmospheric conditions can spoil accurate timing, and change the musical pitch quite detectably. Excessive reproducing machine tension can stretch the tape, with equally bad results. We can be reasonably certain of the sustained strength of a plastic base, but not of a paper base. Paper used today is generally made from wood pulp, whereas older paper was generally made from rag stock. We have only to look at newspapers a few years old to realize that the life of a wood pulp paper is not too long.

At professional tape speeds, programs can be filed away more compactly on disc than on tape, for a half hour on disc requires 10 cubic inches, while a half hour on tape at 30" per second requires about 35 cubic inches. Also, a disc can be replayed immediately after, or even during recording, while tape requires an appreciable time to rewind or spot.

Finally, facilities for playing tape are by no means as plentiful as those for disc. Nor do we yet have standardization on the all important matter of tape speed. In common use today we have the following: 7½, 15, 18, and 30 inches per second. This has special significance to the educator, for speech correction and dramatic work have been helped greatly by the motivation afforded by a chance to take a disc home. The educator will wish to use a tape speed of at least 15 inches per second to get fidelity adequate for educational purposes —but such few machines as his students may have at home will undoubtedly be limited to 7½ inches per second. The professional will be bothered by this situation as soon as he begins to ship tape recordings to various parts of the country.

Electrical Performance Characteristics

The frequency response of a recording *medium* is a hard thing to evaluate, for it depends so heavily on conditions of operation and on associated equipment, that in the case of lacquer no upper frequency limit for the material itself has yet been found. Up to a short time ago, the cutting head constituted the chief limitation on frequency response, but the advent of units using the head as part of a negative feedback loop—"feedback cutters"—has removed this obstacle, and recording in the supersonic region has been so made. Smaller radius recording and reproducing styli are, of course, desirable to reduce tracking loss at very high frequencies when working at normal rotational speed, but test has indicated that our lacquer is strong enough to be entirely satisfactory at such higher needle pressures. It may also be desirable to reduce the length of the burnishing facet of the cutting styli.

The frequency response of tape is limited, basically, by the tape speed and by the minimum attainable slit width in the recording and reproducing heads. The latter presently stands at about ¾ mil, physical width, but the effective magnetic width, considering fringing, is not the same. The slit width limitation can be overcome by running the tape at higher speed, but this raises the cost and operating problems.

Distortion is also a hard problem to evaluate. In disc recording the chief bottleneck used to be the cutting head, but the newest

OFF THE RECORD **By Ed Reed**

"Shyness compels Mr. Winterbottom to deliver his speech from a home recording."
The Register and Tribune Syndicate

cutting heads are so good in this respect that the present distortion limit is set by approximately equal contributions from the recording and reproducing amplifiers, the cutting head and the pickup. *We have not yet produced systems so free from distortion that lacquer distortion, if any, becomes a factor.*

On tape we also have recording and reproducing heads, recording and reproducing amplifiers, but the recording medium itself definitely is a factor. Since the bias for minimum distortion depends on frequency and on level, optimum bias is a compromise. It is not easy to pick a distortion value which everyone would agree on as representative. A comparison of disc and tape is further complicated by the fact that disc system distortion drops rapidly as levels are reduced below maximum, while tape distortion (depending on the bias chosen) may even increase. We have to accept intermodulation distortion figures cited as representative by those engaged in these fields, on which basis disc is somewhat better than tape. Whether it will remain so is a question, of course. We are inclined to feel that it will, for this reason: The electromagnetic part of a system operating at high level is likely to be the part creating the worst distortion. In a disc system, this would be the cutting head, but we have already succeeded in reducing cutting head distortion by including the head in a negative feedback loop. On the other hand, we can see no present way of including the tape itself within an effective feedback loop! It would appear, therefore, that there should be an inherent difference between the two systems, though possibly a small one.

We have not touched on tracking distortion in disc reproduction. This, the failure of the reproducing stylus to follow the groove faithfully, exists only at peak levels at high frequencies, and can be reduced to insignificance by using sufficiently small radii on recording and reproducing styli. In short, with intelligent engineering such distortion occurs only at overload—exactly as tape can be overloaded with ensuing complete distortion.

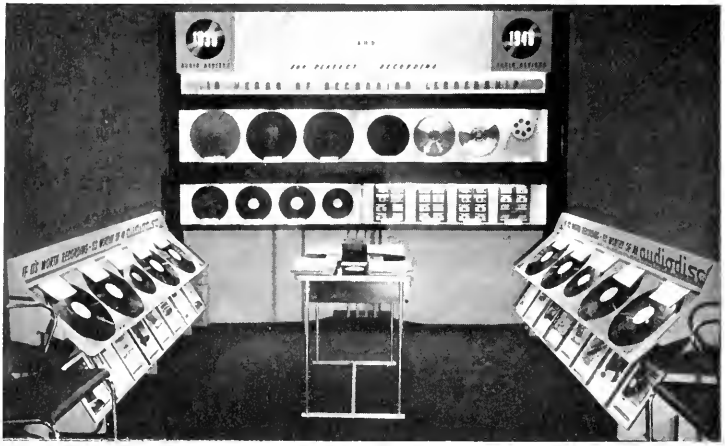
Signal to noise ratio, judging by ear, is fairly similar for both media, though both depend heavily on equipment perfection for best results. Some of the early postwar figures out of Germany suggested fantastically good ratios for tape, but it was soon found that these were weighted figures. American practice is to use unweighted noise data, whence the initial misunderstanding. If we compare practical equipment under practical conditions, we find that the ratios, on a weighted basis, are not greatly different.

Tape has a curious defect which does not show up in *ordinary* methods of measurement, yet which is rather important. This is undersignal noise, which can be best described as noise cyclically modulated in intensity by the signal. It has had only a limited amount of attention because present methods of determination are very laborious, yet the figures so far presented are not to be ignored. The ear does not hear such undersignal noise as noise, rather does it consider it as a kind of fuzz on the tone. In short, the ear is as annoyed by it as by intermodulation, and it exists at all signal levels. The analogous (but not identical) defect on disc can occur only at the extremely high *peak* levels used in some phonograph recording. Cook, who first discovered this effect on disc, has shown that by the proper design of cutting stylus the effect may be reduced to insignificance even at phonograph recording peak levels. In any case, it is not existent at transcription recording levels, or at average phonograph levels.

Duplication

Tape is an instantaneous recording medium, just as is lacquer. Hence we have to

(*Continued on Page 4*)



IRE SHOW HUGE SUCCESS; RECORD REGISTRATION

The 1948 National Convention and Show of the Institute of Radio Engineers, held March 22-25 in New York's Grand Central Palace and Hotel Commodore, was the most successful venture in the Institute's history, IRE officials advise. During the four day meeting, approximately 15,000 persons registered and viewed the show's 190 exhibits — one of which was the Audio Devices' booth (above) displaying the various types of Audiodiscs, their applications, and each step necessary in their production from raw material to finished blank; and the process involved in making phonograph records from Master discs. In addition, engineers stopping at the Audio booth got a glimpse of the company's latest contribution to the sound recording field, magnetic-oxide Audiotape. But perhaps the most interesting part of the Audio exhibit were the history-making recordings lined on the booth's sidewalls. Cut on Audiodiscs during the last ten years (Audio celebrates their 10th anniversary this year) these recordings featured, among others, the following important nation-wide broadcasts: Attack on Pearl Harbor, President Roosevelt's speech in French on North Africa landing, D-Day, Radar to the Moon, Secretary Marshall's "Voice of America" address, and President Truman's recent message to Congress. (This exhibit will also be seen at the Radio Parts Show in Chicago May 11-14 in Booth #83).

Vincent Nola Studios

(*Continued from Page 1*)

paper route, he studied voice under the tutelage of well-known Buffalo and, later, New York teachers.

Young Nola's first professional singing job was in Niagara Falls (he doesn't remember just where in Niagara Falls or just what he did besides sing) at the age of 16. Later, in between professional engagements, Nola taught voice in New York City. Then, Vincent Nola got an idea.

Vincent Nola's idea was to open a large rehearsal studio in New York for bands and other large musical groups. Up to this time, a studio of this type was unheard of. In 1930, Nola put his idea to work when he rented several large rooms in Steinway Hall. Within eight months he had eight studios in this famous old building and many of the top talent of the day were using his facilities. Then Nola got another idea. Why not equip some of these studios with recording equipment so the "big names" could put their renditions on record.

Nola, at this time, knew nothing at all about the engineering aspect of sound recording. But he decided to learn. Nola studied hard, day and night, for three months acquainting himself with the art under the guidance of one of CBS's most talented engineers. Then, after he felt he knew *something* about the recording business he opened two recording studios in the same Steinway Hall. This was in 1934.

The operation was a success from the start and in the years that followed the Nola Studios became a "by-word" with famous popular and classical music artists, "name" bands and other musical aggregations. Both as a rehearsal studio and as a recording studio Nola's became more popular as the years went by. In fact, too popular, with the big bands. For in 1940, the management of Steinway Hall decided that Nola's clients, the fifty and sixty piece variety, were making too much noise for the conservative residents of 57th Street. Nola would have to move.

But Vincent Nola solved the problem by opening the present Broadway studios for his "noise makers" and keeping his 57th Street location open for his less disturbing or "long hair" clientele (opera singers, concert pianists, etc.). This arrangement proved a good move and even today the bands still use the Broadway studios.

Then, as now, seventy-five percent of Nola Studios recording work is done for music publishers for "song plugging" purposes. But in addition such outstanding orchestras as Bob Crosby, Art Mooney, the Dorsey Brothers, Xavier Cugat, Benny Goodman, Frankie Carle, Raymond Scott and Charlie Barnett have used the Nola Studios for their rehearsal and recording sessions.

The secret of Vincent Nola's success in the recording field probably lies in the fact that all six of his recording engineers possess a musical background. As a matter of fact, Nola himself has taught each of these engineers his particular techniques so that they record from the 'musician's' not the 'professional recordists'' point-of-view. As Vincent Nola explains it: "the average listener wants to hear something pleasing to the ear from a musical standpoint. He is not remotely interested in the technical phases involved." All told, Nola employs sixteen people in his two studios.

Naturally, Vincent Nola is as interested in the outcome of the present recording ban edict as everyone else in the business. When asked what his thoughts were on the matter, Mr. Nola smiled and said: "well, I hope a solution will soon be found that will make us all happy. Yes, I mean Mr. Petrillo, too".

Disc Data

(*Continued from Page 3*)

compare them on that basis; i.e., both have to be individually recorded. Likewise, either could be rerecorded onto a processing size lacquer blank, and duplicated as pressings. In so doing, of course, distortion and signal-to-noise-ratio would suffer. Some comparisons have been made between tape and pressings. This is not valid, because an instantaneous material like tape has to be duplicated by rerecording, a high cost process.

Summary

We are sorry to have to say "it all depends" so often, but both disc and tape are going through a quality revolution, and it will be hard to issue any publishable figures until affairs stabilize. In the meantime, we would be disposed to view much of the material published on tape as too superficial. A great many more studies will be necessary before we fully understand the vagaries of the medium. To uncritically assume that a new medium can have no faults is to treat the matter as a layman rather than as an engineer.

Recordings . . . and the Red Cross

(*Continued from Page 1*)

An additional project to be initiated by the Red Cross this year will be the collection and processing of 3,700,000 pints of blood for the 65% of the hospitals in the country who are in no position to supply blood plasma needed in emergencies. This, too, will cost money. John Public must underwrite his own future.

If the past experience of the Red Cross is any indication, however, the American people will again generously respond to the call of these *potent platters*, for funds and for volunteers for its many services. Yes, Red Cross knows the true value of the recorded appeal.

audio reporter

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 5 | 444 Madison Avenue, N. Y. C. | May, 1948

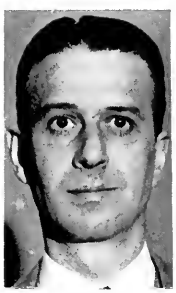
WINNERS IN SCRIPT CONTESTS ANNOUNCED

Scholastic Magazines'—AER Name Winning Entrants In Student Script Competitions

Top Scripts By High School-College Writers "Truly Outstanding", Says Contests' Judges And Educators

Winners in SCHOLASTIC MAGAZINES' 1948 Radio Script Writing Competition (for high school students) and in the ASSOCIATION FOR EDUCATION BY RADIO's National Radio Script Contest (for college students) were recently announced by the two organizations.

Co-sponsored by Audio Devices, Inc., the two contests, both of which started last fall, uncovered many young talented writers who are almost certain to find successful careers in the radio industry. According to reports from the contests' judges, some of whom were professional radio writers, a number of the winning scripts in the various classifications were "truly outstanding" and definitely on a professional level.



N. K. Hoskins Presented Audio's AER Contest Awards

In the high school competition some 250 scripts by student writers in every state in the Union were submitted to SCHOLASTIC MAGAZINES' contest headquarters. This represented, according to William D. Boutwell of the New York publishing firm, an increase of about 150 percent over last year. Counting the scripts that were entered in the 12 regional preliminaries across the country, the total for the contest would reach nearly 400 scripts. Mr. Boutwell also remarked that the quality of scripts submitted was better than in any previous year. The SCHOLASTIC spokesman attributed this marked improvement to two things: 1. the high school radio workshop. 2. the experienced and talented instructors who set up and run these workshops.

In discussing the type of scripts received, Mr. Boutwell explained that this year they received more scripts on racial and religious

(*Continued on Page 2*)

Pictured above are six of the winners in SCHOLASTIC MAGAZINES'-AER's Radio Script Writing Contests. The high school first place winners in the top row are (l. to r.): Sandra Wright, Endicott, N. Y.; Marcia Lebedinsky, Miami Beach, Fla. and June Livingston, New York City. In the bottom row are the winners in the Special Classification of the AER contest. They are (l. to r.): Warren B. Kuhn, first place, New York City; Elaine R. Navy, second place, New York City; and Martin P. Miller, third place, Brooklyn, N. Y.

KDKA-Pittsburgh Promotes Net Programs With Tape Recorder-Specially Rigged Switchboard

KDKA-Pittsburgh, America's first radio station, came up with another *first* a few weeks ago — this time with a novel promotional stunt to hypo listener interest in network (NBC) programs. This newest of all radio gimmicks was the brain child of the Pittsburgh outlet's promotion department, David Lewis.

Last fall, Lewis conceived the idea of having some of the biggest names on the National web make a special recording for his station. The plan was for the recording to be played whenever the KDKA switchboard operator answered incoming calls. For example, instead of the operator answering the call by saying: "KDKA, good morning", Lewis would have a voice announce: "KDKA . . . This is Archie (Duffy's Tavern) the manager speaking. Be sure to hear me program tonight at 9. Now, just a minute please. . . ." Immediately the business-like voice of the regular telephone operator was to come on and say: "KDKA, may I help you"?

Lewis proceeded with his idea and had such well known NBC luminaries as Perry Como, Amos 'n Andy, Jimmy Durante, Bill Stern, Al Jolson, Red Skelton, Charlie McCarthy and several other top stars make individual recordings similar to the conversation described above.

After the recordings were made, KDKA's chief Engineer T. C. Kenney, and Station Manager J. E. Baudino, a top-notch engineer himself, began their work on Lewis' project. Each record was transferred to an individual strip of magnetic tape. A tape recorder was set beside the switchboard, and the engineers devised a

(*Continued on Page 4*)

audio record

VOL. 4, NO. 5 MAY, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Scholastic Magazines'—AER Name Script Contest Winners

(*Continued from Page 1*)

relations than on any other subject. However, he added, scripts dealing with atomic energy, rocket flights, and other modern, scientific marvels and their probable effect on humanity were quite in evidence too. Many scripts on juvenile delinquency and who-will-take-who to the Junior Prom were also received.

The college student competition, which was the first contest of this type ever conducted for the undergraduate, was also a huge success from the standpoint of entries received. According to Dr. Sherman P. Lawton of the U. of Oklahoma, who was chairman of the contest, the enthusiasm shown exceeded even his most optimistic hopes. A total of 250 entries was received in the five classifications (70 in Audio Devices' Special Classification).

The college student's script covered many subjects. And like the high school student, the college entrant showed a vivid imagination of things to come.

An unusual aspect of the AER contest was the fact that the first, second and third place winners in the Special Classification were all students in the same school (New York University) and instructed by the same professor (George D. Griffin). Mr. Griffin explained in a letter to Audio Devices that his three prize-winning students are members of NYU's advanced script writing class which is composed of only eleven students, all of whom have done outstanding work in the past and are believed most likely to succeed as professional radio writers. This class, according to Mr. Griffin, was given the assignment to write scripts for the AER Special Classification because to him it posed a neat problem in writing a short script for a definite market.

George D. Griffin
Tutored all three
Spec. Class. Winners

National winners in the AER competition were announced on May 1 at a special luncheon held at the Deshler Wallick Hotel in Columbus, Ohio. The luncheon was attended by more than 200 persons most of whom were in Columbus for Ohio State University's IER (Institute for Education by Radio) meeting which was held April 30 through May 3.

Louis Forsdale
Judged entries in
Spec. Class.

Representing Audio Devices at the Ohio luncheon, and to present his firm's awards to winners in the Special Classification, was Mr. N. K. Hoskins, a director and representative of Audio Devices in the Midwest. Mr. Hoskins presented the prizes for the Audio winners to Professor Griffin who came to Columbus to accept the awards in behalf of his students.

Below are a list of national winners in both contests — the title of their script — their address (or school) — the name of the winning entrant's instructor — and the awards they received.

SCHOLASTIC MAGAZINES' Radio Script Writing Contest (High School Students)

Judges — Mr. Irve Tunick, Mr. Morton Wishengrad and the editors of SCHOLASTIC MAGAZINES.

Award Winners . . .

Original Radio Drama

FIRST PRIZE, $25: Sandra Wright, 17, Union-Endicott High School, Endicott, N. Y. "Twinkles". Teacher: *Mrs. Edna Finch.

SECOND PRIZE, $15: Jo Anne Kelly, 17, DeVilbiss High School, Toledo, Ohio. "Heavenly Days". Teacher: Olive McHugh.

THIRD PRIZE, $10: Robert Morgan, Summit (N. J.) High School. "The Sun Has Set". Teacher: Ida Herrmann.

Radio Drama Adaptation

FIRST PRIZE, $25: June Livingston, 17, High School of Music and Art, N. Y. C. "Sam Small's Better Half". Teacher: *Edward Stasheff.

SECOND PRIZE, $15: Enid F. Karetnick, Weequahic High School, Newark, N. J. "Anything Can Happen". Teacher: Marie O'Connor.

THIRD PRIZE, $10: Leonard Reiser, 16, Boys High School, Brooklyn, N. Y. "A Case of Circumstances". Teacher: Helen Benson.

Non-Drama Scripts

FIRST PRIZE, $25: Marcia Lebedinsky, 15, The Lear School, Miami Beach, Fla. "A Letter to My Son". Teacher: *Adele Hyrikin.

SECOND PRIZE, $15: Edward George Tarkinson, 16, Brockton (Mass.) High School. "Radio Interview with Isam Khiery". Teacher: Ruth T. Cosgrove.

THIRD PRIZE, $10: Jean Mahoney, Rahway (N. J.) High School. "Dodger Doings". Teacher: Anne M. O'Connell.

* Received 25 Audiodiscs, 3 Sapphire Recording Audiopoints and 3 Sapphire Playback Audiopoints for school recording purposes for having taught first place winners.

AER National Radio Script Contest (College Students)

Judges—Paul Hood, Oklahoman & Times, Oklahoma City, Okla.; Robt. Stephan, Cleveland Plain Dealer, Cleveland, Ohio; Thos. D. Kenney, Prom. Mgr., Newark Evening News, Newark, N. J.; Delmar J. Brent, Writer's Talent Scout, Hollywood, Calif.; and Mr. Louis Forsdale, Instructor in Communication Skills, Teachers College, Columbia University, N. Y. C.

Class 1. Original Dramatic Script (14½ min. in length).

FIRST PRIZE, $50: Sylvan Karchmer, Univ. of Texas.

SECOND PRIZE, $25: William Bender, Univ. of Colorado.

Class 2. Dramatic Adaptation (29½ mm. in length).

FIRST PRIZE, $50: William Arndt, Univ. of California.

SECOND PRIZE, $25: Bob Kampf, Newark, N. J.

Class 3. Non-dramatic Scripts for One Voice (14½ min. in length).

FIRST PRIZE, $50: Theodore Master, Ohio State University.

SECOND PRIZE, $25: Betty Czarlinski, Univ. of Oklahoma.

Class 4. Non-dramatic Scripts for More Than One Voice (14½ mm. or 29½ mm. in length).

FIRST PRIZE, $50: Charles Hutton, Univ. of Oklahoma.

SECOND PRIZE, $25: Jenan Walthour, Ohio State University.

Special Class. Scripts Suitable for Home or School Recording (optional length).

FIRST PRIZE, $100: Warren B. Kuhn, New York, N. Y. Instructor: *George Griffin. "Eagle From Richmond".

SECOND PRIZE, $60: Elaine Ruth Navy, New York, N. Y. Instructor: George Griffin. "Two Hops and a Skip".

THIRD PRIZE, $40: Martin Powell Miller, Brooklyn, N. Y. Instructor: George Griffin. "Mr. Jefferson Makes a Purchase".

* Received same awards as teachers in high school contest.

Audio Devices will publish a collection of prize-winning scripts from both the Scholastic and AER contests, which should be ready for distribution by the opening of the new school year in September. Students whose work is selected for this purpose will receive special awards.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

STYLUS SPECIFICATIONS

In response to a considerable number of inquiries on specifications for our AUDIO-POINTS, we are presenting for the first time complete dimensional data. Quality control of cutting points was discussed in a previous issue.[1]

Bias

C. J. LeBel

Unique among presently available recording styli, our #14 is made with a biased front surface. It will be recalled that the old wax recording stylus was cemented in place, and the recordist would rotate it slightly in its mounting to get the thread to clear the groove reliably. There was a knack to it. Another way of achieving the same end was to move the cutting head (in its cradle) forward of the center line, which nearly has the same effect (though at the expense of distortion increase which does not occur if the point, rather than point and head, is biased).

When we started supplying AUDIO-POINTS we traced occasional thread snarls to the cutting point standards of the day. The sapphire's front face was nominally exactly parallel to the flat on the dural shank (i.e., a bias of 0°), but a variation of ± 1° was possible. ± 1° styli (i.e., in a direction to throw inward) would throw the thread toward the center very nicely, but in a — 1° stylus the natural thread action inward would be opposed by the point tendency to throw outward. The result would be very erratic, with no certainty of thread action, and an excellent chance for a tangle. We built a special measuring microscope, which many visitors to our laboratories have seen, and definitely established the correlation between bias and thread action. By designing for 3°, a manufacturing variation of ± 1° can never reduce the bias to the point where thread action becomes erratic.

Some recordists used to use round shank sapphires to allow the same possibility of adjustment that the wax recordist had with his cemented-in point. This practice became obsolete the moment biased points became available. Other recordists used to shim out one side of their cutting heads to attempt to produce the same effect. A moment's reflection will show that we have biased recording head as well as point edge. The plane of cutting motion is then no longer straight across the groove, in fact a forward and back component is introduced. This is distortion, and cannot be permitted. The biased point is hence definitely superior to the biased recording head.

Sapphire Cutting Styli

Description	Shank Material	Shank Length	Overall Length	Included Angle	Tip Radius	Burnish Length
No. 14 Short 87°	Dural	.531″	.631″	87°	.0015″	.0006″
No. 14 Long 87°	Dural	.656″	.756″	87°	.0015″	.0006″
No. 14 Short 70°	Dural	.531″	.631″	70°	.002″	.0006″
No. 14 Long 70°	Dural	.656″	.756″	70°	.002″	.0006″
No. 202 Short 87°	Brass	.531″	.600″	87°	.002″	.0006″
No. 202 Long 87°	Brass	.656″	.725″	87°	.002″	.0006″

Inspecting this data, we find that the No. 202 is a lower cost unit, and that the sapphire length is shorter than in the No. 14. It should also be pointed out that the No. 14, being made to professional standards, is held to closer tolerances than is the No. 202. Incidentally, 70° styli are now virtually obsolete.

The difference in shank material is necessary to mark these differences in characteristics for the shop and the dealer.

The burnishing facet is all important. Since it is the final manufacturing process, it must affect the final contour of the functional part of the stylus. The resultant dimensions will therefore vary from those listed above, within practical limits.

Stellite Cutting Styli

Description	Shank Material	Shank Length	Overall Length	Included Angle	Tip Radius	Burnish Length
No. 34 Short	Brass	.531″	.600″	87°	Under .0015″	.0003″
No. 34 Long	Brass	.656″	.725″	87°	Under .0015″	.0003″

Being still lower in cost, the radius is not held to as close tolerance, but is maintained at a value low enough to insure that the playback stylus will track on the straight sides of the groove (insuring good tracking).

Steel Cutting Stylus

Description	Overall Length	Included Angle	Tip Radius	Burnish Length
No. 50	.615″	85°	Sharp	.0003″

This is a diamond lapped point; it should not be confused with points which are ground but not lapped, and hence are much noisier.

Sapphire Reproducing Styli

Description	Use	Overall Length	Length of Gem	Length of Shank	Tip Radius	Included Angle
No. 113	Professional	.625″	.083″	.542″	.0023″	24°
No. 103	Home, straight shank	.750″	.018″	.732″	.0025″	47°
No. 303	Home, bent shank	.650″	.018″	.632″	.0025″	47°

The significant differences are the change in length of sapphire, and the tip radius. The included angle and shank length changes are only to mark the difference in unmistakable fashion for the shop.

The professional No. 113 has a sapphire length several times as great as that of the lower cost No. 103 and 303.

The professional tip has a radius of .0023″, well adapted to transcription grooves. On the other hand, for home phonograph records the larger radius of .0025″ is preferable. While there has been considerable advocacy of .003″ tips for home reproduction, we do not agree. A .003″ tip is initially very slightly quieter, but the noise quickly exceeds that of the smaller radius, and coincidentally the distortion and record wear increase. The differences can be credited to the better tracking of the smaller radius. A point which follows the groove faithfully will cause less wear than one which cannot trace the finer convolutions. Hence we have chosen the .0025″ radius.

It should be pointed out that all of these styli can be resharpened when worn out playing pressings. This is a real economy, for resharpening is much lower in cost than a completely new needle. This has been made possible by using a longer gem (than is customary for home points) in the 103 and 303.

New Standards

When the NAB and RMA committees now working adopt standards, these specifications will be changed to conform if necessary. It is believed that present points will work satisfactorily with proposed standards, and in many cases will require no change at all to conform. In any case they can be modified to conform when sent in for resharpening.

Reference

1. *Sapphire Quality Control—C. J. LeBel, Audio Record, June 1947.*

Speech Students At Alabama College Benefit Greatly By "Before-After" Recordings

Alabama College, the state college for women at Montevallo, Alabama, is another of the many schools across the country who insist that recording equipment is their most valuable ally in speech training.

According to a recent letter received from Miss Ellen-Haven Gould, Head of the Speech Department at Alabama College, speech courses require the use of the recording machine as early as it can possibly be scheduled. The purpose, of course, Miss Gould relates, is to record the status of the students' speech for a record of "before and after."

"This first recording," says Miss Gould, "we find is of great value to our students. They discover what they sound like, in voice quality, to others, as well as hearing their mannerisms in pattern, and carelessness in pronunciation and enunciation. Then, each student is given an individual hearing and critical analysis with a course of procedure to follow in drill.

"Here the mirrophone or voice mirror is their valuable aid. Time is scheduled in the clinic for use of this machine where the student can drill and check on her own progress, or get an immediate picture of deficiencies. Near the close of the course, a new disc is cut and compared to the first."

Another value of recording at Alabama College is the file of southern speech records; and since there are many variations and peculiarities in different areas of the State and South, these recordings have proved to be of interest to graduate students of Philology and Phonetics as well as professional research sources of study.

New Maintenance Manual Sent NBC Thesaurus Subscribers

Managers of more than 400 radio stations subscribing to the NBC Thesaurus, musical program service to the NBC Radio-Recording Division, are currently receiving a newly produced booklet, "Maintenance Procedure for the Broadcast Transcription Reproducing System."

Consisting of 16 pages of recommendations and six pages of illustrative diagrams, the manual was prepared by research engineers of the NBC Radio-Recording Division. In addition to maintenance procedures for the reproducer itself, a section of the manual is devoted to suggestions for the care of transcriptions.

In an enclosure letter to Thesaurus subscribers, Robert W. Friedheim, director of the division, states: "The satisfactory reproduction of transcriptions is so much a matter of the proper maintenance of the reproducing system that we have long felt a need for a detailed discussion of recommended procedures." . . .

Edith Hingley, KDKA-Pittsburgh switchboard operator listens while T. C. Kenney, Chief Engineer, and J. E. Baudino, General Manager, explain the technical phases of the station's telephone answering gimmick. A magnetic tape recorder specially rigged to the outlet's switchboard played back recorded "hellos" of network stars to incoming callers—KDKA's way of hypoing listener interest in web shows.

KDKA - Pittsburgh Promotes Net Programs with Tape Recorder-Special Rigged Switchboard

(Continued from Page 1)

means whereby the tape would feed through automatically and continuously. The machine was then connected with the switchboard. When the board buzzed, the operator merely had to press a button and wait for the NBC star to speak his piece.

So, with the stage all set, KDKA decided it was the time to put the "stunt" in use. The result was terrific.

As one caller after another was greeted by the familiar voice of a famous radio name, the station was soon swamped with more telephone calls than they could handle. It seemed everybody in Pittsburgh wanted to talk with his favorite radio personality.

Audio Record asked the KDKA engineering staff to explain the technical phases of the telephone answering gadget and they forwarded on this bit of information:

"The main piece of equipment was (as explained above) a magnetic tape recorder. Each announcement was recorded on an endless piece of tape, the total length of which was ten inches longer than the exact amount needed for the recording. A system of free-running pulleys was devised and mounted on a piece of micarta on a plane parallel to the surface of the recording machine. One pulley was mounted in a slot so as to vary its position to take care of the varying lengths of tape. The output of the playback amplifier in the tape recorder was connected to a voice-operated relay, the time constant of which was set at approximately two seconds. The relay itself was connected up in such a manner that two seconds after the modulation from the tape was ended the driving motor would stop. The motors were started manually by the telephone operator pushing a button and would continue to run until modulation stopped. A pressure pulley was added to the capstan drive to prevent slippage of the tape.

"The output of the playback amplifier could be connected either indictively to the PBX operator's headset or a small loudspeaker could be located close to the PBX operator's mouthpiece. However, the first method of coupling is in violation of the telephone company's tariffs".

If Mr. David Lewis comes up with any more of these "ideas" we're sure there'll be fewer young ladies aspiring to a career that entails manipulating a switchboard — especially the KDKA variety.

ATTENTION

The Editors of Audio Record welcome contributions from its readers. Any news concerning your recorded programs or other recording activities, that you believe will be read with interest by recordists, can be used. Photographs, drawings, or graphs needed to illustrate your material will be appreciated also. Address all contributions to:—The Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 6 | 444 Madison Avenue, N. Y. C. | June-July, 1948

It could only . . .

Have Been Done With Discs

By Frederick W. Ziv, President
FREDERICK W. ZIV COMPANY
Cincinnati, Ohio

(Everyone even remotely connected with the recording industry knows of the last-minute rush made by record companies and transcription firms last December to record as many of their hit tunes and musical programs as possible before the Petrillo recording ban became law. In the following article, written expressly for Audio Record, Mr. Ziv, head of one of the nation's top-flight syndicated transcription companies, tells in his own words how his firm broke all stamina records in cutting a series of Guy Lombardo musical programs before the recording deadline.)

It could only have been done with discs. The ink on the contract between our company and Guy Lombardo was hardly dry last fall when James C. Petrillo announced the ban on music transcriptions. The news came with startling suddenness and filled the air with frustrated hopes. Here were we, embarking on a very costly venture, bringing Guy Lombardo and his legendary aggregation to the "syndicated circuit" for the first time — and there was Mr. Petrillo, saying: "that's all, brother."

But the AFM ukase had one compelling virtue which traveled by the name of "forewarned is forearmed." The ban was not to go into effect until the last day of the year, December 31, 1947. True, it allowed only a couple of months to prepare ourselves for the coming void, but this was no time to cry in one's beard; this was the time for a drowning man to reach for that straw. The straw was a simple thing — recording.

We began a frantic race against time. "Beat the deadline!" You see, it is vital to our interests to be in a position to offer not merely half a dozen programs in a continuing series but as many as a year or two of one-a-week shows, in short, a minimum of between 52 and 104 weekly packages.

Guy Lombardo and his crew sweated it out with us. We had them over at a New York recording studio virtually day and night. Occasionally we would take half an hour off to eat at a nearby restaurant, but mostly we had food brought in. Sofas and chairs served for cat-naps. On one day alone we started and finished four — count 'em — half-hour shows, and even David Ross, our Lombardo Show narrator, who

(Continued on Page 3)

"Yale University News Bureau"

In addition to collecting historic recordings (see article below), Yale University makes good use of recording equipment, too. Here, Miss Constance Welch, Associate Professor of Play Production, points out to Eileen Crawley, a student actress, the reasons why she might be cast for a certain role. Most students at Yale make recordings of their own voices for self-study and comparison.

Recorded Voices of Many Famous Persons Filed In Yale University's National Voice Library

Heart stopping moments in history, such as the charge of the bugler at Balaclava or President Roosevelt's address to Congress the day after Pearl Harbor, along with speeches, recitations and comments by many famous and historic personages are contained in the beginnings of what will some day be a vast voice library at Yale University in New Haven, Conn.

Robert Vincent of New York City, who has made a hobby of collecting and recording voices since he was a boy donated the first discs of his "national voice library" to Yale in 1942, added to the collection last year and plans to add much more to it in the future.

For two hours recently an Audio Record reporter listened to recordings picked at random from the collection—the voices of Presidents Taft, Wilson, Coolidge and both Roosevelts, Florence Nightingale and a host of other famous people.

Possibly the most curious disc of the lot was made in London 57 years ago by Kenneth Landfrey. His name has been forgotten, but he was the bugler for the Light

(Continued on Page 4)

Boston Station Airs Views Of Average Citizen On New Show 'People's Microphone'

Reversing the usual procedure of quizzing celebrities on current affairs, station WCOP-Boston has inaugurated a new recorded feature titled "People's Microphone", which airs the opinions of John Q. Public. Following the logic that the average man-in-the-street is the one that is affected by passage of new laws, etc., WCOP has taken the "People's Microphone" to markets, districts, stores, in short, anywhere that people congregate.

Questions asked range from local politics to international developments and the discs containing these opinions, running

(Continued on Page 2)

audio record

VOL. 4, NO. 6 JUNE-JULY, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

WCOP's "People's Microphone"

(Continued from Page 1)

from fifteen to forty-five seconds in length, are broadcast in conjunction with latest news developments of the particular subject in question. On controversial issues, both points of view are broadcast on the same newscast. In an effort to present a true cross section, people in any and every walk of life are quizzed.

A recent example of the operation of "People's Microphone", occurred during the height of the controversy over the abandonment of service on the "Old Colony" railroad to commuters from Boston's South Shore. Walter Kidder, of the WCOP Special Events Dept., took the "People's Microphone" on a regular run of the train, and gathered comments on how the proposed abandonment of service would affect the lives of these people.

The operations of the "People's Microphone" call for a portable microphone and portable recorder. In most instances, the recordings are transferred to discs for air presentation. This allows for editing of outside noises, and proper cueing.

This 16" x 22" cardboard display, in five colors, is being used to promote the sales of Audiodiscs and Audiopoints for home and school recording. The folders, prepared especially for non-professional recordists, give complete details on the group of discs and styli particularly suitable for these users.

This is *Tiny Hill*

How Many Discs Does He Weigh?

Iowa Station Sponsored Unique Contest To Find Answer for This Query

This is the Tiny Hill Story (three times bigger than the Jolson Story) and how one of the most unique contests of all time came into being.

Tiny Hill, it might be well to explain, is an orchestra leader. And a mighty big one, too (no pun intended). Tiny was just finishing a record breaking engagement at the Paramount Theatre in Waterloo, Iowa.

Well, Tiny's popularity gave KAYX Waterloo an idea. Why not sponsor a "Tiny Hill Contest" and have the station's listeners guess "how many phonograph records would equal Mr. Hill's weight". The winner would receive a radio-phonograph combination, 25 passes to the Paramount Theatre and an album of Tiny's records personally autographed by him.

Everyone agreed the contest was a good idea. So, the Iowa station's two popular disc jockeys, Ray Starr and Erling Jorgensen, got the contest off to a fast start by interviewing Tiny Hill via portable recorder in Cedar Rapids, Iowa. Starr and Jorgensen explained the rules and the contest, which was to last for one week, was on.

The results were terrific. Over 2,000 letters and cards poured into the Iowa station with guesses as to Tiny's weight in discs. And on the last night of Tiny's appearance at the Paramount, he was weighed on the stage. How much? Exactly the equivalent of 787½ phonograph records. The contest winner: Mr. C. A. Moore, 617 Hope Ave., Waterloo.

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disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

STEEL STYLUS SPECIFICATIONS

In the May issue we presented for the first time complete dimensional data on our cutting styli and on sapphire reproducing styli. We intentionally omitted data on steel reproducing points, for lack of space for the necessary explanation.

C. J. LeBel

The method of producing the tip curvature of a steel needle is entirely different from that employed with sapphire. It is possible to grind and lap the gem tip to radius with diamond dust, with exact predetermination of the dimension and shape. The surface is exceedingly smooth, for a diamond lap working on an extremely hard material can make a very fine finish.

Because of the low cost of a steel needle, this individual lapping is not possible. Instead, mass production methods are used, of such nature that most but definitely not all of the product is satisfactory. Needles of correct dimension and shape of tip are selected by individual measurement in a high power projection microscope (a "shadowgraph"). The projection screen carries a precision template on which are drawn limit curves.

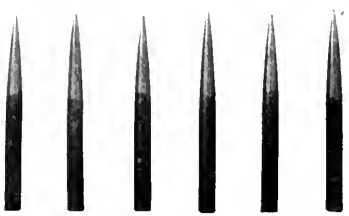


Fig. 1 When steel playback points have been shadowgraphed, the complete uniformity of the styli is assured.

The following procedure is used. High carbon steel wire is fed into a special machine, in which the tip is ground to a sharp point, and the shank is cut to length. A batch of several million of the needles is then heat treated for maximum usable hardness, producing a hard, rough blank. This is then tumbled with abrasive in a barrel or a leather bag. As the tumbling proceeds, the surface acquires a high polish and the

sharp tip begins to round off. Periodically, a handful are removed from the barrel and shadowgraphed. When the average tip radius of the handful has reached the proper value, the entire batch is removed from the tumbling barrel and cleaned. If these were ordinary needles, they would then be packaged and shipped. They might even be marked "shadowgraphed" because of the test of a handful out of a million.

This process is not infallible. A considerable number of needles are made, with tip defects which would lead to distorted reproduction or to damaged grooves.

There is only one way that 100% good points can be shipped: by shadowgraphing 100% of the product. It is very important that the envelope be marked "100% Shadowgraphed". On the average, one needle in eight is rejected in shadowgraphing. Statistical experience indicates that in such a case the number of bad points which would be found in an envelope of uninspected needles, while averaging one in eight, might reach as high as one in three in any given package. Shadowgraphing then is valuable not for the good needles you receive, but for the bad needles you do not receive!

Fig. 2 — Typical points rejected in shadowgraphing. The first two points are hooked, the second two are broken off at the tip and the third two have split points.

In the shadowgraphing process a needle may be rejected for any one of the following reasons:

1. *Oversize point* — Would cause poor tracking and distorted reproduction.
2. *Undersize point* — Would cause poor tracking and distorted reproduction. In many cases would damage a lacquer groove.
3. *Flat end* — In most cases would damage both a lacquer groove and a high quality phonograph record.
4. *Split points* — Would damage any record they played.
5. *Broken points* — Would ruin any record they played, lacquer or pressing.
6. *Hooked points* — Very likely to ruin any record they played, also very likely to cause poor tracking and distorted reproduction.

A few typical rejects are shown in Fig. 2. It is evident that the owner of a good record library must be as careful with his needle as is the user of lacquer discs.

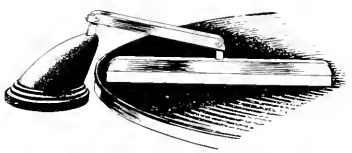
Incidentally, in a properly designed shadowgraph the point rolls as it goes through the machine, so that the tip is inspected from every angle. Otherwise, a diagonal flat might not be detected, for it is

(*Continued on Page 4*)

Dr. Walter H. Juniper (above), assistant dean and Professor of Latin at Baylor University, Waco, Texas, is one disc jockey who believes in recording his recordings. Confused? Well, we'll unconfuse you by explaining that Dr. Juniper, whose 'Jukebox of Yesteryear' a 15 minute program featuring old recordings cut during the 'roaring twenties', heard every Thursday evening throughout most of the school year over the campus radio Station, KIYS, records his entire program before it is broadcast in order that he might 'knock out the kinks' and edit the show until it is letter perfect. "Naturally," Dr. Juniper explains, "my program is presented 'live' but the pre-broadcast recording makes it a far better presentation." The Baylor professor further advises that he uses his own portable recorder to record other nightly radio features for next day playback in order that his 6 year old daughter, Margaret, who goes to bed a little too early, may hear them.

Audio's "Chip-Chaser" Boon To Recordists With Thread Worries

Probably one of the most ingenious devices ever produced in the recording industry was developed by Audio Devices, Inc. Next to the correct choice of recording disc and styli, this one gadget can do more to prevent a bad recording than any other single instrument. That gadget is the Audiodisc Chip Chaser.



The Chip-Chaser does exactly what its name implies—it chases the thread cut from the record away from the cutting head and winds it around the turntable's center post, thus preventing thread tangles under the recording stylus.

Another outstanding characteristic of this device is that it will not scratch or in any way impair the recording.

The Chip-Chaser, which is actually an aluminum-backed strip of felt, is attached to and supported by a cast-iron base placed at the side of the turntable. It conveniently tips up and out of the way when not in use and can be adjusted to fit any size turntable. No screws or bolts are needed.

For further information on the Audiodisc Chip Chaser, see your local distributor or write Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

Only With Discs

(*Continued from Page 1*)

is nothing if not calm, burst out with a wild yell that spelled out B-R-A-V-O!

Make no mistake about it, this was not merely a battle for the almighty dollar. This was a challenge to American genius, the American type of esprit de corps. The idea of a race against a little day on the calendar whetted our collective appetites; as in the late war, it's the blueprints that win the battles. Our blueprints worked, and we won the battle.

We produced enough in the series to give us a respectable backlog and an assurance that our sales force could go out and sell Lombardo to the hilt, which they did.

Although production was stepped up almost beyond human endurance, one wouldn't know it on hearing the programs.

Our producers, writers and directors worked night and day. Worked with Lombardo vocalists Don Rodney and Kenny Gardner . . . with music publishers on advance hit tunes, with Lombardo arrangers on tunes not to be released until late in '48. The results: a series of radio programs that sets a new high in quality.

But Lombardo and Ziv notwithstanding, *it could only have been done with discs.*

David H. Clift, Associate Librarian at Yale, listens to an original recording of the voice of the late William Lyon Phelps. The collection of discs shown are only a small part of the Yale National Voice Library which is being assembled by its curator, Robert Vincent of New York City. "Yale University News Bureau"

Voices of Many Famous Persons in Yale Library

(*Continued from Page 1*)

Brigade who sounded the call for the charge at Balaclava in October, 1854, and became one of the survivors of the immortal "600".

In 1890 Landfrey recorded "the charge" on a wax cylinder, using the same bugle he carried into the "valley of death" and which had been carried by another bugler at Waterloo. The wax cylinder cracked before the re recording (which is now part of the Yale library) was made, but the charge rings out clearly, nevertheless.

Another interesting recording our reporter listened to was William Jennings Bryan's historic declaration at the 1896 Democratic national convention — "You shall not crucify mankind upon a cross of gold, etc."—This recording was poor, however, and did not reflect Bryan's true oratorical ability.

Unfortunately, space limitations do not allow us to mention, or list here, all the historical discs, with the voices of history's famous sons and daughters, which are filed in the Yale library, but among some of the more interesting recordings are: Calvin Coolidge making his "declaration of principles" in the 1924 campaign; Woodrow Wilson speaking in a conversational tone to an audience of farmers in the campaign 12 years before; Theodore Roosevelt giving his "covenant with the public" speech the same year and William Howard Taft voicing his views on capital and labor on an occasion in 1906. Then, there is a disc featuring the voice of A Conan Doyle explaining how he came to write the Sherlock Holmes stories. And, George Bernard Shaw in a dissertation called "Spoken English and Broken English" in which he blurts out: "You think you are hearing my voice, but unless you know how to use your gramaphone what you hear may be something grotesquely unlike any sound that comes from my lips." (Shaw maintains that the speed at which a phonograph plays has to be regulated for each individual speaker.) Another record was the voice of James Whitcomb Riley reciting some of his poetry. This disc proved that Riley was a much better writer than talker.

Of all the discs filed at Yale, perhaps the recording made by Thomas A. Edison, which he made to be played at an electrical show in New York's Madison Square Garden in 1908, is the oldest. Although it has been preserved quite well, it is still pretty poor by modern standards.

As mentioned before, Robert Vincent, the main contributor to the Yale voice library, has been a recording enthusiast all his life. As a matter of fact, this hobby led to his appointment as chief of the United Nations sound and recording section. In a letter to the university in 1942 Vincent told a little bit about his recording work and his hopes for the voice library.

In his letter, he predicted that the United States citizen of 2042 "will often make a trip to Yale and listen to the thinkers, the scientists, the artists of our time."

He wouldn't hear much, though, if all thinkers, scientists and artists responded like an unnamed Harvard professor about whom Vincent told. When asked to say something so that his voice could be preserved for posterity, the professor spoke just two words. They were "Hello, posterity."

Special Recorded Broadcast To Italy Pictures Life In An American High School

A typical day in an American high school was recorded and beamed to Italy a few weeks ago by the State Department's radio channel, "Voice of America". Italian government stations rebroadcast the program in Italy.

The unrehearsed question and-answer-broadcast, direct from the classroom of a fourth-year Italian class in New Utrecht High School in Brooklyn, N. Y., was the second in a series of international educational programs sponsored jointly by the State Department and the New York City Board of Education.

Four New York City high school students of the Italian language and one recent arrival from Genoa, Italy took part in the recorded program which was conducted entirely in Italian. Each student was interviewed concerning the differences between American and Italian secondary schools by Fred Chambers, head of NBC's Italian division.

The American student's greater freedom in choice of subject and greater individual responsibility in building the kind of secondary education which will be most useful to him in later life were typical comments of the students.

Disc Data

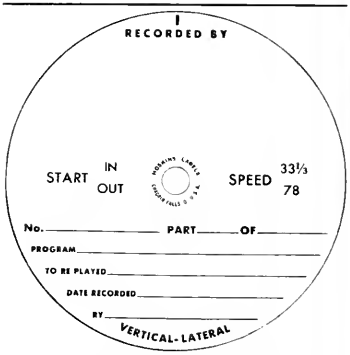
(*Continued from Page 3*)

generally visible from one direction and invisible from another.

Inspected and approved needles then go through a machine which sprays red and yellow lacquer on the shanks. They are then packaged and shipped.

The standard dimensions of our type No. 151 shadowgraph steel needle are as follows:

Overall length ¾"; length of shank ½"; diameter of shank .067"; tip radius .0025"; tip included angle 15°; material high carbon steel.



The New Hoskins Label

After receiving numerous requests from its readers for information on where to obtain quality, but inexpensive, transcription labels, Audio Record is pleased to pass along the information that Hoskins Labels, 210 South Franklin Street, Chagrin Falls, Ohio is now producing new, high quality gummed labels at relatively low cost. Available in convenient quantities of 500 up, these labels are 3⅞" in diameter with a 5/16" concentric center hole and are ideally suited for radio station, or studio use on 16", 12" and 10" discs.

Each Hoskins label has a "split back" for ease in stripping and is made ready to apply by the simple process of removing the glassine backing in the same manner as with a Band-Aid. No moistering or other treatment is required. The latex base adheres to the record base perfectly.

The Ohio firm will imprint these labels to suit the individual needs of any radio station, commercial studio, school or other recording user. Imprints (station's call letters or concern's name) may be had in red, blue, green, brown or black on black and white background.

The prices of the new Hoskins' labels, which incidentally have been enthusiastically received by the trade, are as follows:

Quantities of 500.....$16.50
Quantities of 1000..... 29.50

Samples may be obtained by addressing a penny post card to Hoskins Labels or to SREPCO, 135 East Second St., Dayton, Ohio.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 7 | 444 Madison Avenue, N. Y. C. | October, 1948

AUDIO TO AGAIN SPONSOR SCRIPT AWARDS

This Year's Success Prompts Decision To Back '49 Contest

All Senior High School Students In U. S.*-Canada Eligible To Win Many Cash Prizes in Writing Competition

For the second straight year, Audio Devices, Inc. will sponsor the Radio Script Classification in SCHOLASTIC MAGAZINES' 1949 "Scholastic Writing Awards", (See Page 4 for Contest Rules and List of Awards).

Formal announcement of Audio Devices' continued sponsorship will be made at the School Broadcasting Conference in Chicago early this month.

One of the outstanding attractions of the school term for the past twenty-six years, the "Scholastic Writing Awards" is one of five programs in the annual "Scholastic Awards", conducted by the New York publishing firm. The "Awards" are open to all students regularly enrolled in U. S. (*its possessions) and Canadian senior high schools.

Radio Script Writing, the classification in which Audio Devices took part for the first time in the 1948 Competition, is one of the newest classifications in the "Scholastic Writing Awards", and, judging from entries received in the contest just ended, one of the most successful. All told some 500 scripts by student writers from forty-eight states, many of whom plan to make script writing their careers, were submitted to SCHOLASTIC MAGAZINES' contest headquarters.

Many of the '48 prize winning scripts were broadcast in various sections of the country and a number of them are being published by Audio Devices in a booklet called "Audioscripts-1948". This booklet is now available for both school and general use. Price is $1.00 list—60¢ to schools. Copies may be obtained by writing Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

As in the 1948 Contest, Radio Script Writing will be divided into three classifications — Original Radio Drama, Radio Drama Adaptation and General Radio Script. The AER (Association for Education by Radio) will again closely cooperate in the running of these and all contests in the radio script division.

Regional contests will also again be

(Continued on Page 4)

Brunell Harvey (left), Manager of the Baylor University campus radio station KIYS, and Chief Announcer Dick Lewis check a recently recorded disc in the Texas school's studios.

Acting-Announcing-Writing-Management, etc. All Included in Baylor U.'s Radio Itinerary

By Edgar G. Will, Jr., Radio Department
BAYLOR UNIVERSITY
Waco, Texas

The Radio Department at Baylor University, while comparatively young, has grown tremendously in size and prestige during the past four years of its existence. Under the skillful guidance of Professor John W. Bachman, the department not only produces programs for stations throughout Texas, but also has established a campus "wired-wireless" station which is operated by the students on the Baylor campus.

At the request of the Baylor Hospital in Dallas, the department is preparing promotion scripts to be aired, and is considering making film strips for use in teaching. Recently, the offer came to produce a series of programs in Spanish for use over the National Network of Mexico, in an effort to strengthen the cultural understanding between Texas and Mexico. In all of this work recordings play an important part.

The Radio Department has approxim-

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In Next Month's Issue..

Outstanding Feature Article on Columbia's Long-Playing Record

In the November issue of Audio Record, we will feature an outstanding article by one of Columbia Record's top engineers on their new long-playing micro-groove disc. You won't want to miss this account of one of the most revolutionary developments in the history of sound recording. All the facts surrounding the advent of the new 33 1/3 rpm recording system which cuts up to 300 grooves per inch. Be sure and watch for it!

audio record

VOL. 4, NO. 7 OCTOBER, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Hold-the-Line Price Policy Announced by Audio Devices

According to a statement recently released by William C. Speed, President of Audio Devices, the increased cost of aluminum, which went into effect on September 1st, will not result in higher prices for Audiodiscs.

"We shall make every effort," Mr. Speed related, "to absorb this new aluminum price raise, and thus continue our prices at the present level. Our calculations indicate that with some improved efficiency, now under way, and continued large volume production, we shall be successful in this hold-the-price effort."

In their ten year history, Audio Devices found it necessary to raise prices only once and that was in January, 1947 when, after years of increasing labor and material costs, the price of aluminum shot up 50%. But even then their average increase in disc prices was only 32%.

Radio at Baylor University

(*Continued from Page* 1)

ately 275 students taking courses at this time — courses in radio Acting, Announcing, radio Writing, Production, and Management.

In the Announcing classes — recordings are made at the beginning and end of the quarter, and wire recordings are used throughout the term to aid the students in developing a professional quality in their work. Discs are used for auditions if these are desired by the students for professional use, and for this work 12" Audiodiscs are used.

In radio Acting — audition discs are cut only at the end of the course, although portions of dramatic productions are recorded both on disc and wire throughout the term. The students grasp the finer points of radio acting by actually hearing themselves and others in a program. Also, the great dramas of the networks are recorded off the air and used as illustrations throughout the course. For this work the 16" Audiodisc is employed, at 33 1/3 rpm. (The quality and fineness of Audiodiscs make them ideal for this work. These professional programs are also played to Survey classes as representative of the types of programs on the air today).

In radio Production — recordings are used to bring out and point up the fine art of producing a smooth, logically connected program, and both student and professional programs are recorded for illustration.

While the Radio and Speech Departments are separate at Baylor, there is close cooperation and the students in beginning speech courses cut records at the beginning and end of the term, as well as those students who are in the higher interpretative classes. These discs are helpful in judging the progress made by the individual students during the term. We also record special discs for speech correction work carried on by the Speech department. At the present time the Department of Drama is not using instantaneous recordings extensively.

Outside of study and interpretation, the largest and most important use of discs is for program presentation. Baylor University does one of the series of the Texas Adult School of the Air known as "Have You Heard." These programs (musical in nature) are recorded in our studios and sent to the Texas State Network for broadcast throughout the State. Each week the School of Music cooperates with the Radio Department in presenting the finest talent for these programs.

Frequently we are asked to record special programs for the School of Music or other groups on campus. Many of the finest symphonies, musical artists, and choral groups have been reproduced on Audiodiscs at Baylor. Each Christmas the Radio Department records Handel's "Messiah" performed by the Baylor Symphony, All-University Chorus and organ, which program is broadcast and re-broadcast by "ET" throughout the state. Recently, when the same orchestra and chorus presented the first Southwest performance of the "Coronation Te Deum" by Vaughn Williams, written for the coronation of George the 6th, of England, a recording was made at both 78 rpm and 33 1/3 rpm in order that copies could be made for regular phonographs. These two last recordings were used in our regional broadcasting, inasmuch as stations in Corpus Christi, Dallas, and Waco all used them.

At Baylor University the National Radio Honorary Fraternity Alpha Epsilon Rho has a chapter which presents a half hour drama weekly over the campus radio station KIYS. These dramas are recorded and exchanged with other student stations in distant universities.

A third type of use for recordings at Baylor is the purely "reference recording" — a famous speech (as in the case of President Truman speaking at Baylor a year ago in April) or the President of Harvard speaking on Atomic Power, or perhaps the Chapel presentation of the Poet-Laureate of Texas. For these occasions and many others, recordings by disc are invaluable. Due to the high percentage of music recordings, the quality of discs must be of the finest, and we have for some time used Audiodiscs for this work.

disc-data for the Recordist

By C. J. LeBel, Vice President
AUDIO DEVICES, Inc.

OVERCOMING HUMIDITY EFFECTS

One of the most serious problems faced by the recording disc industry, since the first lacquer coated disc was produced, is well summed up in the trite old saying — "It isn't the heat, it's the humidity."

C. J. LeBel

For humid conditions in the factories have frequently held up production during the summer months. It is also true that a disc which has absorbed too much moisture would make a poor recording. The noise level would increase progressively while recording and the cut would get greyer and greyer. In fact, noise level increase of as much as 30 db has been observed — solely due to excessively humid conditions. If the cutting stylus were lifted and cleaned and the cut restarted, it would begin as quiet as originally, then grey up again. This problem, in varying degrees, has affected the entire lacquer disc industry.

Air conditioning disc factories would naturally seem the answer. But this does not help during transportation and storage under adverse conditions. It is not usually realized that water *vapor* will even pass through most "waterproof" materials. Moisture absorbed during the summer can produce bad effects months later, for it is released much more slowly than it is absorbed. At the same time, it should be remembered that a "summer formula" of less good qualities is valueless, for discs bought in summer may be used in fall or winter, when no excuses for poor performance would be accepted.

In view of all this, the most logical solution was to formulate a recording lacquer which was basically the same as before, but in which the effect of moisture was minimized. It was necessary to avoid the use of materials of unknown history and doubtful stability.

In doing this, our chemical formulator had a number of tools available. He had a large weather room in which discs could be stored and recorded. The humidity and temperature controls of this room could be set to maintain 90°F., 90% relative hu-

nidity — holding the worst summer conditions 24 hours a day.

He had data on the previous performance in the field. As we have used serial numbers since the start of production in 1939, this made available an immense stockpile of information. In fact, we are now, more than ever, convinced that it is impossible to run a good system of quality control without such serial numbering.

The first step was the substitution of materials in the same *family* as the material being replaced. Some changes were suggested on chemical grounds: replacement of short chain by long, for example. Each change involved several tests, for sometimes the proportion had to be changed at the same time. There was also some study of purer grades of material. This is an exceedingly complex subject, because tests for organic impurities are specific in nature, and you need to know what you are looking for before you start. Ordinary measurements of physical properties, such as specific gravity, refractive index, etc., are not apt to be very informative when the impurity is present to the extent of only .1%. Spectrophotometric methods are useful only under certain limited conditions.

The next step was the substitution of material taken from other groups listed in our previous studies as having good stability. Our biggest improvement, the one which finally brought success to the research, came from one such change.

It was found necessary to test each proposed ingredient as a part of the complete formula — no short cuts were possible. This complicated the testing procedure, for when say 15 out of 20 ingredients have varying degrees of moisture sensitivity, a change in one will effect an improvement which is hard to detect. When we had narrowed the work down to 3 sensitive ingredients, the work proceeded very rapidly, so that as the spring of 1948 approached we knew we had a lacquer of superior reliability.

Countless tests in our "weather room" show that the improved AUDIODISC is remarkably resistant to moisture absorption. Discs subjected to a temperature of 90° at 80 to 90% humidity for many weeks show no increase in noise level while recording. Ordinary discs, under the same conditions, show a noise level increase of from 15 to 25 db.

Perhaps the best proof of the value of this long research program has come in the summer just concluded — one of the most humid on record. For the first time in many years our factory and customers were able to run with no interruptions from the weather, with a product which recorded as well on the hottest and dampest day as it would have on a crisp fall or winter day.

A typical studio scene during a recording session of the American Cancer Society's educational series "It Can Happen to You". The place: ABC's recording studios in New York.

ACS's Use of Recordings in Fighting Dread Disease Totd

Society's Radio Head Praises Discs

The American Cancer Society's use of transcriptions in furthering the fight against one of the world's most dread diseases is divided into two categories: 1. Educational—a year-round activity and 2. Fund Raising — during the month of April which is their campaign month.

The Society's first educational project in 1948 was the "It Can Happen To You" series. This series of recordings, which received a special award at the Ohio State University's Institute for Education by Radio, was presented on approximately five hundred stations across the country.

The ACS's second educational series of half-hour programs "That These May Live" was released in May and indications are that these programs too have been and are being presented on many, many stations throughout the nation.

In July 1947 and again this past June the Society released for direct distribution to all radio stations in the U. S. a platter on which there were twelve one-minute announcements and six fifteen-second and six twenty-second station break announcements plugging one of their free booklets on cancer. As to the effectiveness of these recorded messages, ACS reports show that they averaged 20,000 requests per month on the first disc with literally a nation-wide pick-up.

During the Society's campaign month, four double-face recordings were distributed to every AM and FM station in the country. These discs included the recorded appeals of famous movie and radio personalities, three five-minute musical programs by top name bands, two dramatic fifteen-minute programs explaining the status of cancer research as well as an explanation of the Society's educational work and an interview type program featuring Hollywood stars Joseph Cotton and Irene Dunne. This last disc was produced in such a manner that local announcers could interview the Hollywood star, bringing "national glamor" right down to the local level. More than 1200 stations used some or all of the four discs during the campaign.

When asked how important a role recordings played in his organization's work, Walter King, Director of Radio in the Society's Publicity Department, commented: "I feel that they not only maintain a uniformity of production levels but perhaps more important, they make it possible for us to service radio stations with cancer broadcast material in a manner which makes it usable with the least effort and assures availability for repeat use."

All American Cancer Society recordings were recorded by the American Broadcasting Company, Recording Division, in New York.

Audiodisc Chip-Chaser Well Received

In the June-July issue of the "Audio Record", Audio Devices announced that their AUDIODISC CHIP-CHASER, a simple device for thread removal, was again on the market. This announcement was well received by recordists, not only from the large number of orders received, but from the favorable comments on the part of some of the users. As the head of one recording studio wrote us: "We have one of your CHIP-CHASERS. It works like a charm and allows the operator much more freedom from nervous strain. I no longer fear ulcers."

Frederick C. Packard

Recorder of Poetry

Professor Frederick C. Packard, associate professor of public speaking at Harvard University, is an avid recording enthusiast but, unlike most of his fellow recordists, his specialty is, of all things, poetry.

Yes, Professor Packard began his unusual hobby of collecting, for posterity, the voices of contemporary poets, reading their own verse, some 15 years ago. The noted British-American poet, T. S. Eliot, reading "Gerontion" and "The Hollow Men" got Frederick Packard started on his way and he has been going strong ever since.

Throughout the years, Professor Packard's hobby grew, and under the name of the Harvard Vocarium — a place where voices are kept and listened to — was set up as a library collection of poetry for student use. Today it is the largest single source of records of poets reading their own poetry in the world.

And now, probably as a memento of his 15th anniversary of recording outstanding poets, Professor Packard has once again recorded some of the works of T. S. Eliot. The new discs, which will include among others "Journey of the Magi," "A Song for Simeon" and "Fragment of an Agon," will even be available to the public in limited quantity.

Packard's collection, which was established, because, as he puts it, "poetry should be listened to", includes poets such as W. H. Auden, Stephen Spender and many famed Harvard names, including Charles Townsand Copland, better known as "Copey" reading from the Bible; Bliss Perry, noted Emerson and Thackaray authority, and Robert Hillyer.

The Harvard professor believes that the collection, which also contains many famed prose writers, has a great future in the educational world, particularly in the field of English. (Editor's Note:— Professor Packard advises that Audiodises have been used exclusively ever since the Harvard Vocarium has been in existence.)

Audio To Again Sponsor Scholastic Script Contest

(*Continued from Page* 1)

staged throughout the country, and as we go to press many leading radio stations and newspapers have already volunteered to sponsor local contests in their areas.

All entries in the 1949 National competition, to be judged by famous professional radio writers, must be in on or before midnight March 4, 1949. (Where regional Writing Awards are held, work must be submitted to meet their earlier deadlines). Winners in the three classifications out lined above will be announced in May, 1949. Shortly before this announcement, however, school principals will receive notification, as well as the cash awards for presentation to their winning students.

Rules and regulations governing the contests and a list of awards follow:

Rules and Instructions

1. All students in grades 10, 11 and 12 in any public, private, or parochial high school in the U. S., its possessions, and Canada are eligible. They may enter any or all three of the classifications.

2. No radio script will be considered for the Awards if it has been entered in any other national competition.

3. Each script must contain a separate full-page sheet on the front; on this sheet should be written the following information:

(a) Entrant's name, home address (street number, city, state).
(b) Entrant's school and its address.
(c) Name of entrant's teacher.
(d) Name of entrant's principal.
(e) Age of entrant on March 4, 1949.
(f) Entrant's grade.
(g) Classification of entry (Original Radio Drama — Radio Drama Adaptation — General Radio Script).
(h) Entrant's signature.
(i) Signature of entrant's teacher.

4. All scripts must follow standard radio script form. Maximum length: 3,500 words. Shorter scripts preferred.

5. Scripts in any one of the three classifications must be written in accordance with the following:

(a) *Original Radio Drama* — Must be an original treatment.
(b) *Radio Drama Adaptation* — Scripts based on published material; fiction, biographies, history. Accompany script with source facts; title, author, publisher. Where possible, use non-copyright sources.
(c) *General Radio Script* — May be interviews, dialogues, news, sports, variety programs, continuity for music, etc. Any form except drama.

6. Although students are free to enter the Competition individually, it is recommended that work be included in the group sent by a teacher after preliminary eliminations at the school.

7. Scripts should be typed or written legibly in ink, on one side only of paper 8½" x 11". Pages should be numbered.

8. Entries may be sent at any time during the school year up to the closing date, March 4, 1949. Mail direct to Scholastic Writing Awards, 7 East 12th Street, New York, N. Y.

9. Scripts MUST be mailed flat (not folded or rolled) at the first class postage rate of 3½ an ounce.

10. The decisions of the judges and of the editors of Scholastic Magazines are final.

11. All scripts receiving national awards become the property of Scholastic Corporation, and no other use of them may be made without written permission.

12. No scripts will be returned. (Students should keep carbon copies of their entries.)

Awards

Students

1st. Prize (in each classification) — $25.00
2nd. Prize (in each classification) — $15.00
3rd. Prize (in each classification) — $10.00
4th. Prize (in each classification) — $ 5.00

(*There will be five 4th Prizes in each classification.*)

Teachers

Teachers of students winning first place in each classification — 25 Audiodises, 3 Sapphire Recording Audiopoints, 3 Sapphire Playback Audiopoints.

Supplementary Award

For each script submitted found suitable for publication in booklet form — $10.00. (Short scripts of skits 200-900 words — maximum playing time 6 mins. — that other school groups can produce are especially welcome.)

Sounds (Recorded) In The Night

Just to make positively sure that all sounds on the RIP LAWSON, ADVENTURER! recorded show are authentic, producer James Allen (throwing hand cue in background) of Soundscript Productions, Hollywood, takes his cast right out into the street for a busy street sequence on one of the programs. The sound man though on this show must be quick with the records for jet-propelled planes, atomic bombs and many other scientific gadgets are all integral parts of the popular recorded juvenile thriller.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 9 444 Madison Avenue, N. Y. C. December, 1948

N.Y. Philharmonic Symphony Program Offers High School Students Special "Week End With Music"

Voice Recordings Help Judges Make Final Selection of Musically Talented Students

The New York Philharmonic Symphony program, broadcast every Sunday afternoon over CBS stations, offers an unusual musical opportunity for talented high school students all over the country.

Every week, three students are given a two day trip to New York City, including the "rounds" of the finest operas, ballets, musical theatres, and concert halls as guests of the Standard Oil Company (New Jersey), sponsor of the Philharmonic broadcasts. These fortunate and talented students are given an opportunity to meet some of the most celebrated artists of our time, and their week-end of exciting behind-the-scenes adventures in New York's musical life is climaxed by an "on the air" interview with Mr. Deems Taylor, noted composer and commentator. This interview is a 10 minute feature of the New York Philharmonic Symphony broadcasts, giving America's most talented musical students an opportunity to tell the vast CBS radio audience about the high points in their "Week End With Music," and about their own musical experiences and accomplishments.

The "Week End With Music" National Advisory Board has adopted the following plan for the nomination and selection of the student participants in the program. Any student, 16 years of age or over, enrolled in the 10th, 11th, or 12th grades of any U. S. public, private, or parochial high school is eligible. Each high school in the United States is invited to nominate the student or students who are best qualified to appear on this program. After reviewing the official Nomination Forms sent in by the school principals, the Board selects a group of candidates — with the advice and assistance of the experienced Scholastic Awards staff of "Scholastic Magazine."

The chosen candidates are then requested to visit their nearest CBS or other local radio station for a voice recording. These

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Above: Deems Taylor (right) conducts Philharmonic broadcast discussion with guest students—left to right, Ervin Fennel, DuBois, Pa.; Carolyn Stanford, Chester, South Carolina; and Dorothy Jones, Shreveport, La.

At Right: Lauritz Melchoir (left) of Metropolitan Opera, radio and screen, entertains Philharmonic's guest students—left to right, Thora Vervoren, West Green Bay, Wisc.; Joyce Ristine, Maple Falls, Washington; and Dorothy Ruddell, Parkersburg, West Va.

W. C. Speed

RADIO'S No. 1 PROBLEM

by William C. Speed, President Audio Devices, Inc.

As competition begins to stiffen between broadcasters, managers naturally turn a watchful eye on unnecessary expenditures. Yet, at the same time, it is in their own interests, as well as the interest of their sponsors, to maintain or *increase* their listening audience. The obvious conflict between these two factors — maximum operating economy and audience appeal — is probably the basic cause of radio's No. 1 problem. For when "economy" is carried to the point where it affects the listening pleasure of a program it ceases to be economical. Worse yet, it not only cuts down the listening audience it may reflect unfavorably on the broadcasting industry as a whole.

Any normally critical listener today knows that the general trend of program quality (as far as fidelity and easy listening are concerned) is definitely not upward. In fact many specific instances could be cited where transcribed program material

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audio record

VOL. 4, NO. 9 DECEMBER, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Radio's No. 1 Problem

(*Continued from page 1*)

in particular is far from satisfactory. This situation is doubly unfortunate — and doubly questionable — when we consider these facts. A broadcast station's transmitting equipment represents an investment of several hundred thousand dollars and is fully capable of sending out fine, distortion-free programs. The sponsor invests perhaps hundreds of thousands of dollars in obtaining the finest talent and program material. But somewhere along the line, the quality of the entire program has been sacrificed in the name of economy.

This, of course, is no news to the station engineers. They know where the trouble lies, but are not in a position to do anything about it—for they do not hold the purse strings. No engineer, for example, likes to use worn out music recordings—to see appropriations for transcription pickup heads and good points become tighter and tighter—or to have to use the same so-called permanent point pickup day after day interchangeably on shellac pressings, lacquer and vinyls. Yet it too often has to be done. Nor does the engineer like to use cheap wire recorders to delay a top quality program which cost a small fortune to produce. Because a good tape machine, costing around $3,000, can do an unusually fine job, it is too often the custom to use any tape on any machine with any bias, ignoring the end result—listening discomfort!

Economy-minded studio executives may say—"After all, what difference does it make. The vast majority of radio sets are miniatures and you can't tell the difference anyway." The fallacy of such thinking is obvious to the engineer. In the first place, it simply isn't true. Distortion added to distortion spells listener discontent even if he doesn't know just why. Moreover, it's the big set owners who often represent the highest purchasing power in a community — and they will unconsciously dial over to a "more agreeable" station. No broadcaster can afford to economize on his recordings if it means compromise with fidelity. It's not fair to the artists, the sponsors, the engineers, or to the public.

All broadcasters know that recording is a most important link in program presentation. They also know that high quality recording equipment is available — equipment that represents but a small percentage of the total station investment. But do they realize how seriously a *poor quality* recording can affect their listening audience? If they don't, the problem is simply one of education. If they do—and still insist on "cutting corners" to cut costs — they must recognize that they will eventually be cutting down their own income. There's no future in that.

To some of you, this may seem like an unfounded complaint. It's not. Here's a typical example. Not long ago, while traveling through the midwest, I called on the chief engineer of a station just recently on the air. I was shown a beautiful new 10-kw transmitter – a splendidly treated studio — excellent and expensive audio input equipment. By this time, I expected to see equally modern and excellent recording apparatus. But no—here was economy. Two wire recorders costing less than $150 each! Later, I checked with many of the local listeners. The general opinion was that a lot of this station's programs "didn't sound so good."

We are all in this radio broadcast business together. Set sales mean more listeners, improved transcribed shows mean more listeners, distortion free recordings mean more listeners. Radio's economic health depends on more listeners. These all important listeners cannot be held with poor programs whether poor in material or ruined with poor fidelity.

REPRODUCTION QUALITY GETS "PSYCHOANALYZED" AT ROCHESTER FALL MEETING

C. J. LeBel, Vice President of AUDIO DEVICES, INC., Presents Paper on "Psycho-Acoustics"

C. J. LeBel

The topic of high quality reproduction was attacked from a new viewpoint at the RMA Rochester Fall Meeting on November 10 in Rochester, New York. This forum where radio set designers discuss their problems included a symposium on "What Constitutes High Fidelity," with the following speakers: Messrs. Harvey Fletcher of Bell Telephone Laboratories, John K. Hilliard of Altec-Lansing Corp., and C. J. LeBel of Audio Devices. All three speakers stayed well away from that badly abused term "high fidelity," concentrating instead on the more significant problem of practical home reproduction.

The subject of Mr. LeBel's talk, "Psycho-Acoustic Aspects of Higher Quality Reproduction," was admittedly a challenging one. For it is a subject which seems to have been avoided, intentionally or otherwise, by all too many of the country's radio set designers.

In his talk, Mr. LeBel applied scientific principles in a frank appraisal of the ever-present but seldom recognized problem of *listening fatigue*—what causes it, how to measure it, and what can be done to minimize it.

The quality of sound reproduction which is considered as "acceptable" to the average radio listener is a far cry from the sound quality that assures easy listening. And in designing to such minimum standards, radio and phonograph manufacturers are inadvertently limiting the use of their product. For when the listener gets tired, he simply turns off the set— without realizing why he has ceased to enjoy the program. The *cause* is not immediately apparent for the reason that listening fatigue does not occur in the ear itself, but in the understanding centers of the brain.

According to Mr. LeBel, experienced merchandisers believe that the reproduction quality of a radio, phonograph, or hearing aid has a definite effect on product sales, as well as on the extent of their use. Certain particularly successful manufacturers have had designs which consistently have been less fatiguing than competitive designs in a comparable price class. The inexperienced listener, who never heard of "psycho-acoustics," expresses his appreciation for sound quality of reduced fatigue factor by such expressions as: "It sounds very natural," "The announcer seems right here in the room," and "This is very easy to listen to."

In the hearing aid field, it has been demonstrated that a drastic reduction in fatigue effect, with no visible change in the instrument, doubled sales within a period of months. The listener response to a hearing aid, however, is more positive than to a radio set, since the former must be used twelve to sixteen hours a day — and it cannot always be turned off when the listener becomes fatigued.

There are many factors that contribute to listening fatigue. Mr. LeBel listed extraneous "noise" as the worst offender, followed by harmonic and intermodulation distortion, artificially peaked loudspeaker response, and inadequate frequency response. As to the practice of slightly attenuating high frequencies, he stated that this was an effective interim way of rendering slightly distorted wide band reproduction

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Psycho-Acoustics

(*Continued from page 2*)

more palatable. He estimates that while only 50% of the listeners would be satisfied to have available an upper cutoff frequency of 5 Kc, 90% would be satisfied with 8 Kc, and 99% with 10 Kc. This, of course, assumes a system relatively free from fatigue factors—and without distortion or attenuation in the upper frequencies. It also recognizes that unwanted high frequencies could be removed by a tone control, whereas insufficient high frequencies to begin with, could not be later increased in bandwidth.

With reference to the recording aspects of the problem, Mr. LeBel stated that lacquer disc recording quality has, for the past 10 years, been more than adequate to meet the demands of the most critical ear with minimum listener fatigue. Much improvement, however, is still called for in improved consistency of manufacturing quality of higher quality pressings, and the improvement of amplifier circuits and speaker designs of reproducing equipment in the medium price radio field.

Mr. LeBel summarized his remarks by saying that "the typical set engineer is very wrong in thinking that the auditory system is easy to deceive, and that perpetrating an acoustic fraud upon it will have no repercussions. The auditory system is inarticulate, not uncritical. Whereas the eye rebels very fast at unsatisfactory conditions, the ear is slow to anger. Even when very angry, it does not directly reveal the cause of its rage. Yet, in the end, it enforces its desires surprisingly well. Every time a listener yawns and turns off his set his ear has won a victory."

Week End With Music

(*Continued from page 1*)

recordings are submitted to the National Advisory Board to help in determining the final selection of the students. This phase of the selection helps the judges to decide on those students whose "voice personality" will assure maximum interests in the broadcasts. As it is obviously impractical for the judges to hold personal interviews with each candidate, the voice recordings provide a very effective substitute.

Any high school principals who are not already familiar with this "Week End With Music" program, can obtain nomination forms and complete details by writing to the National Advisory Board, "Week End With Music," 485 Madison Avenue, New York 22, N. Y.

I.D.E. OFFERS NEW SERIES OF TRANSCRIBED DRAMAS

Top-Flight Artists and Authors give "STORIES TO REMEMBER" Outstanding Audience Appeal

The Institute for Democratic Education has recently completed thirteen new 15-minute recordings, in a series entitled "Stories to Remember." This is the 12th presentation of I.D.E.'s famous "Lest We Forget" series, which has been aired by leading independent and network stations from coast to coast.

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This new series is offered free of charge to the nation's radio stations and networks as a public service, to help remind all Americans that prejudice and discrimination have no place in our truly American way of life.

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George D. Griffin

How To Get the Best Out of Student Scripters

by Prof. George D. Griffin
N. Y. University

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audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 4, No. 9 444 Madison Avenue, N. Y. C. December, 1948

N.Y. Philharmonic Symphony Program Offers High School Students Special "Week End With Music"

Voice Recordings Help Judges Make Final Selection of Musically Talented Students

The New York Philharmonic Symphony program, broadcast every Sunday afternoon over CBS stations, offers an unusual musical opportunity for talented high school students all over the country.

Every week, three students are given a two day trip to New York City, including the "rounds" of the finest operas, ballets, musical theatres, and concert halls — as guests of the Standard Oil Company (New Jersey), sponsor of the Philharmonic broadcasts. These fortunate and talented students are given an opportunity to meet some of the most celebrated artists of our time, and their week-end of exciting behind-the-scenes adventures in New York's musical life is climaxed by an "on the air" interview with Mr. Deems Taylor, noted composer and commentator. This interview is a 10-minute feature of the New York Philharmonic Symphony broadcasts, giving America's most talented musical students an opportunity to tell the vast CBS radio audience about the high points in their "Week End With Music," and about their own musical experiences and accomplishments.

The "Week End With Music" National Advisory Board has adopted the following plan for the nomination and selection of the student participants in the program. Any student, 16 years of age or over, enrolled in the 10th, 11th, or 12th grades of any U. S. public, private, or parochial high school is eligible. Each high school in the United States is invited to nominate the student or students who are best qualified to appear on this program. After reviewing the official Nomination Forms sent in by the school principals, the Board selects a group of candidates — with the advice and assistance of the experienced Scholastic Awards staff of "Scholastic Magazine."

The chosen candidates are then requested to visit their nearest CBS or other local radio station for a voice recording. These

(*Continued on page 3, Col. 1*)

Above: Deems Taylor (right) conducts Philharmonic broadcast discussion with guest students—left to right, Ervin Fennel, DuBois, Pa.; Carolyn Stanford, Chester, South Carolina; and Dorothy Jones, Shreveport, La.

At Right: Lauritz Melchoir (left) of Metropolitan Opera, radio and screen, entertains Philharmonic's guest students—left to right, Thora Vervoren, West Green Bay, Wisc.; Joyce Ristine, Maple Falls, Washington; and Dorothy Ruddell, Parkersburg, West Va.

W. C. Speed

RADIO'S No. 1 PROBLEM

by William C. Speed, President Audio Devices, Inc.

As competition begins to stiffen between broadcasters, managers naturally turn a watchful eye on unnecessary expenditures. Yet, at the same time, it is in their own interests, as well as the interest of their sponsors, to maintain or *increase* their listening audience. The obvious conflict between these two factors—maximum operating economy and audience appeal—is probably the basic cause of radio's No. 1 problem. For when "economy" is carried to the point where it affects the listening pleasure of a program it ceases to be economical. Worse yet, it not only cuts down the listening audience it may reflect unfavorably on the broadcasting industry as a whole.

Any normally critical listener today knows that the general trend of program quality (as far as fidelity and easy listening are concerned) is definitely not upward. In fact many specific instances could be cited where transcribed program material

(*Continued on page 2, Col. 1*)

audio record

VOL. 4, NO. 9 DECEMBER, 1948

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Radio's No. 1 Problem

(*Continued from page 1*)

in particular is far from satisfactory. This situation is doubly unfortunate – and doubly questionable – when we consider these facts. A broadcast station's transmitting equipment represents an investment of several hundred thousand dollars and is fully capable of sending out fine, distortion-free programs. The sponsor invests perhaps hundreds of thousands of dollars in obtaining the finest talent and program material. But somewhere along the line, the quality of the entire program has been sacrificed in the name of economy.

This, of course, is no news to the station engineers. They know where the trouble lies, but are not in a position to do anything about it – for they do not hold the purse strings. No engineer, for example, likes to use worn out music recordings – to see appropriations for transcription pickup heads and good points become tighter and tighter – or to have to use the same so-called permanent point pickup day after day interchangeably on shellac pressings, lacquer and vinyls. Yet it too often has to be done. Nor does the engineer like to use cheap wire recorders to delay a top quality program which cost a small fortune to produce. Because a good tape machine, costing around $3,000, can do an unusually fine job, it is too often the custom to use any tape on any machine with any bias, ignoring the end result – listening discomfort!

Economy-minded studio executives may say "After all, what difference does it make. The vast majority of radio sets are miniatures and you can't tell the difference anyway." The fallacy of such thinking is obvious to the engineer. In the first place, it simply isn't true. Distortion added to distortion spells listener discontent even if he doesn't know just why. Moreover, it's the big set owners who often represent the highest purchasing power in a community – and they will unconsciously dial over to a "more agreeable" station. No broadcaster can afford to economize on his recordings if it means compromise with fidelity. It's not fair to the artists, the sponsors, the engineers, or to the public.

All broadcasters know that recording is a most important link in program presentation. They also know that high quality recording equipment is available – equipment that represents but a small percentage of the total station investment. But do they realize how seriously a *poor quality* recording can affect their listening audience? If they don't, the problem is simply one of education. If they do – and still insist on "cutting corners" to cut costs, – they must recognize that they will eventually be cutting down their own income. There's no future in that.

To some of you, this may seem like an unfounded complaint. It's not. Here's a typical example. Not long ago, while traveling through the midwest, I called on the chief engineer of a station just recently on the air. I was shown a beautiful new 10 kw transmitter – a splendidly treated studio – excellent and expensive audio input equipment. By this time, I expected to see equally modern and excellent recording apparatus. But no – here was economy. Two wire recorders costing less than $150 each! Later, I checked with many of the local listeners. The general opinion was that a lot of this station's programs "didn't sound so good."

We are all in this radio broadcast business together. Set sales mean more listeners, improved transcribed shows mean more listeners, distortion free recordings mean more listeners. Radio's economic health depends on more listeners. These all important listeners cannot be held with poor programs whether poor in material or ruined with poor fidelity.

REPRODUCTION QUALITY GETS "PSYCHOANALYZED" AT ROCHESTER FALL MEETING

C. J. LeBel, Vice President of AUDIO DEVICES, INC., Presents Paper on "Psycho-Acoustics"

C. J. LeBel

The topic of high quality reproduction was attacked from a new viewpoint at the RMA Rochester Fall Meeting on November 10 in Rochester, New York. This forum where radio set designers discuss their problems included a symposium on "What Constitutes High Fidelity," with the following speakers: Messrs. Harvey Fletcher of Bell Telephone Laboratories, John K. Hilliard of Altec-Lansing Corp., and C. J. LeBel of Audio Devices. All three speakers stayed well away from that badly abused term "high fidelity," concentrating instead on the more significant problem of practical home reproduction.

The subject of Mr. LeBel's talk, "Psycho-Acoustic Aspects of Higher Quality Reproduction," was admittedly a challenging one. For it is a subject which seems to have been avoided, intentionally or otherwise, by all too many of the country's radio set designers.

In his talk, Mr. LeBel applied scientific principles in a frank appraisal of the ever-present but seldom recognized problem of *listening fatigue*—what causes it, how to measure it, and what can be done to minimize it.

The quality of sound reproduction which is considered as "acceptable" to the average radio listener is a far cry from the sound quality that assures easy listening. And in designing to such minimum standards, radio and phonograph manufacturers are inadvertently limiting the use of their product. For when the listener gets tired, he simply turns off the set – without realizing why he has ceased to enjoy the program. The *cause* is not immediately apparent for the reason that listening fatigue does not occur in the ear itself, but in the understanding centers of the brain.

According to Mr. LeBel, experienced merchandisers believe that the reproduction quality of a radio, phonograph, or hearing aid has a definite effect on product sales, as well as on the extent of their use. Certain particularly successful manufacturers have had designs which consistently have been less fatiguing than competitive designs in a comparable price class. The inexperienced listener, who never heard of "psycho-acoustics," expresses his appreciation for sound quality of reduced fatigue factor by such expressions as: "It sounds very natural," "The announcer seems right here in the room," and "This is very easy to listen to."

In the hearing aid field, it has been demonstrated that a drastic reduction in fatigue effect, with no visible change in the instrument, doubled sales within a period of months. The listener response to a hearing aid, however, is more positive than to a radio set, since the former must be used twelve to sixteen hours a day – and it cannot always be turned off when the listener becomes fatigued.

There are many factors that contribute to listening fatigue. Mr. LeBel listed extraneous "noise" as the worst offender, followed by harmonic and intermodulation distortion, artificially peaked loudspeaker response, and inadequate frequency response. As to the practice of slightly attenuating high frequencies, he stated that this was an effective interim way of rendering slightly distorted wide band reproduction

(*Continued on page 3, Col. 1*)

Psycho-Acoustics

(*Continued from page 2*)

more palatable. He estimates that while only 50% of the listeners would be satisfied to have available an upper cutoff frequency of 5 Kc, 90% would be satisfied with 8 Kc, and 99% with 10 Kc. This, of course, assumes a system relatively free from fatigue factors—and without distortion or attenuation in the upper frequencies. It also recognizes that unwanted high frequencies could be removed by a tone control, whereas insufficient high frequencies to begin with, could not be later increased in bandwidth.

With reference to the recording aspects of the problem, Mr. LeBel stated that lacquer disc recording quality has, for the past 10 years, been more than adequate to meet the demands of the most critical ear with minimum listener fatigue. Much improvement, however, is still called for in improved consistency of manufacturing quality of higher quality pressings, and the improvement of amplifier circuits and speaker designs of reproducing equipment in the medium price radio field.

Mr. LeBel summarized his remarks by saying that "the typical set engineer is very wrong in thinking that the auditory system is easy to deceive, and that perpetrating an acoustic fraud upon it will have no repercussions. The auditory system is inarticulate, not uncritical. Whereas the eye rebels very fast at unsatisfactory conditions, the ear is slow to anger. Even when very angry, it does not directly reveal the cause of its rage. Yet, in the end, it enforces its desires surprisingly well. Every time a listener yawns and turns off his set his ear has won a victory."

Week End With Music

(*Continued from page 1*)

recordings are submitted to the National Advisory Board to help in determining the final selection of the students. This phase of the selection helps the judges to decide on those students whose "voice personality" will assure maximum interests in the broadcasts. As it is obviously impractical for the judges to hold personal interviews with each candidate, the voice recordings provide a very effective substitute.

Any high school principals who are not already familiar with this "Week End With Music" program, can obtain nomination forms and complete details by writing to the National Advisory Board, "Week End With Music," 485 Madison Avenue, New York 22, N. Y.

I.D.E. OFFERS NEW SERIES OF TRANSCRIBED DRAMAS

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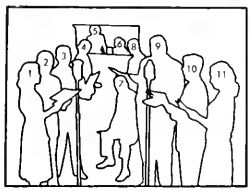
PUBLISHED BY AUDIO DEVICES, INC.

Vol. 5, No. 2 | 444 Madison Avenue, N. Y. C. | February, 1949

WPIC Transcribes Complete Series of Dickens Novels

Distinctive program feature sets a new high in enduring literary value

by Evelyn Keller, Publicity Director, Radio Station WPIC, Sharon, Penna.



The partial cast of "Great Expectations," consisting of students, amateurs, and ex-professionals, makes a recording for a future broadcast over Stations WPIC and WPIC-FM.

1. Phyllis Williams ("Estella")
2. David MacArthur ("Pip")
3. Harald Smith (Announcer-narrator)
4. Mary McCullough (Turntable operator)
5. Evelyn Keller (Director)
6. Bannie Massy (Central Operator—Studio Engineer)
7. Raymond Daly ("Magwitch")
8. Bruce Hickman ("Bentley Drummle")
9. William Pound ("Jaggers")
10. Edwin Good ("Herbert")
11. Helen Slass ("Miss Havisham")

More than three years of writing and research preceded the inauguration, over Radio Station WPIC, Sharon, Pennsylvania, on September 26, 1948, of a new series of weekly half-hour radio plays based on the works of the English novelist, Charles Dickens.

From the beginning, it was obvious that the huge casts involved largely composed as they were of non-professional talent, would make it impossible . . . or at least, inadvisable . . . to attempt to maintain a weekly schedule of live broadcasts. (In "Nicholas Nickelby," for example, there are thirty-four different characters. Fortunately, they do not all appear in any single episode!) All the programs, have, therefore, been produced in WPIC's studios and transcribed on 16-inch Audiodiscs.

The aim of the series is to present, in half-hour episodes, the complete series of novels by Charles Dickens, numbering fourteen in all, if one includes the unfinished mystery, "Edwin Drood." The intent of the series is to give the radio audience dramatic programs of greater literary value and more lasting interest than soap operas. While individual Dickens works have been produced over the air, this series, so far as is known, marks the first time the entire fourteen novels have been adapted for broadcast use. Much care has been taken to present each work in a form that will be easy for the listener to follow, while yet

(*Continued on Page 2, Col. 1*)

Tense Moments of History Brought to Life on New Columbia Discs

Priceless Historical Recordings, from 1933 to 1945, Dramatize One of the Most Eventful Eras of All Time

The past decade holds many unforgettable memories for all of us. Memories of world shaking events and screaming front-page headlines. But, perhaps more clearly than anything else, we remember the *radio*. How we used to listen tensely, eagerly, anxiously to the news broadcasts — to the voices of commentators, correspondents, and men who were making history both at home and abroad.

Few of the general public, however, realized that at the same time these memorable voices were coming to us over the air, the recording turntables back at the station were quietly at work, engraving a permanent record of the drama that unfolded day by day.

The vast library of historical reference recordings and transcriptions filed away in the archives of the country's leading broadcast stations can tell one of the most dramatic stories of all time. They can bring to vivid life events long gone by — they can speak to us with voices of those no longer here.

These priceless historical recordings, however, have not previously been available to the public. But Columbia's recently released album entitled "I Can Hear It Now" brings a collection of dramatic historical selections to all who want to hear and remember. It is available in an album of five 12 inch discs and also on a single LP Microgroove record. This collection was

(*Continued on Page 2, Col. 2*)

audio record

VOL. 5, NO. 2 FEBRUARY, 1949

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada

Transcribes Dickens Novels

(*Continued from Page 1*)

retaining the majority of the myriad characters and the thread of the many plots and sub-plots. Each book is allowed to run its natural course, so that while "Barnaby Rudge" was presented in only four half-hour episodes, "Nicholas Nickelby" will require ten.

The transcribed programs are broadcast at 2:30 P.M. each Sunday afternoon over WPIC and re-broadcast at 8:30 P.M. each Monday evening over its Frequency Modulation affiliate, WPIC-FM. Much interest has been evoked among schools and colleges in the area, and many requests have already been received for permission to use the scripts or the transcribed shows in classroom work. In several speech courses the Sunday shows are required listening, and each episode is discussed in class the following day.

The current schedule, which began in September, 1948, and will run through May, 1949, includes six books: "Bleak House," "Barnaby Rudge," "David Copperfield," "Hard Times," "The Old Curiosity Shop" and "Dombey and Son." The series will go off the air for the summer months, and resume in the fall of 1949 with "Great Expectations."

To date, "David Copperfield" has met with the most enthusiastic public response, and small wonder: It was Dickens' best work and lent itself to the most fluent radio adaptation. But it is hoped that the lesser known works will make a lasting impression on listeners, too, if only to lead them to the D section of the public library. There are low spots in Dickens, as there must be in all such prolific authors. "Little Dorrit" is one of these "lows," but it will be produced, for what it is worth, in seven episodes.

No attempt has been made to include the much overworked "Christmas Carol" in the series, though it is planned to use one of Dickens' other Christmas books . . . probably "Cricket on the Hearth" . . . at Christmas-time, 1949.

Casts are recruited from among the speech students of Youngstown and Westminster Colleges (including one professor from the Drama Department of Westminster), from the members of the Youngstown (Ohio) Playhouse, and local amateurs and ex-professionals. One of the mainstays, for example, a man who has appeared in some role in every Dickens book to date, is an old time stage actor who is now the manager of a local liquor store!

Direction and production work is handled by the writer, assisted by a studio engineer, a cutting engineer, a turntable operator for sound effects and music, and a staff announcer. Each half-hour episode is rehearsed and transcribed in one evening's work.

For the writer, this has been an exciting and fruitful experience. The end is not yet in sight, and the whole project may well consume five or six years. They will have been well spent. As a free-lance (for such shows as "Suspense" and the Kate Smith hour, in radio, and for other media), the writer cannot help but be tremendously influenced by so intimate an acquaintance with an author who could devote an entire page to the description of the buttons on a man's vest, making each button an object of interest and a source of humor.

The success of this series leads one to wonder whether there are not other authors of Dickens' caliber and prolificness to whose well radio might not regularly and profitably carry its bucket. When "Edwin Drood," the fourteenth and final Dickens book, is completed, we mean to go further afield. Conrad? Hawthorne? Wilkie Collins? Stevenson? Perhaps, some day, even Shakespeare.

Tense Moments of History

(*Continued from Page 1*)

prepared by Edward R. Murrow, radio news reporter, and Fred W. Friendly, radio producer and script writer. The compilation of this material was, in itself, a monumental task. Over a period of more than 2 years Mr. Murrow and Mr. Friendly played back a total of more than 500 hours of old broadcasts. Over 100 hours of this material were recorded from the lacquer to magnetic tape. This provided a flexible medium from which the final selections were made, and re-recorded on disc form, with narration by Mr. Murrow. His commentary unifies and explains the historical selections, leading the listener effortlessly through the highlights of a 13 year period, from 1933 to 1945. The events recorded are not necessarily included in their precise chronological order, but rather are arranged to give the maximum dramatic effect to the entire presentation.

The first famous voice to be heard is that of Will Rogers, from a recording made in 1932. This is followed by the very familiar voice of Franklin D. Roosevelt, in his message of encouragement to the nation on March 4, 1933. His voice is heard again and again — the last time in his report to Congress on the Yalta meeting. Then comes Huey Long — the Duke of Windsor in his abdication address — Fiorello H. La Guardia — Alf Landon — and John L. Lewis. You hear a dramatic on-the-spot account of the Hindenburg disaster — the voice of Neville Chamberlain telling a falsely relieved world that, after the acquisition of Sudetenland, Hitler will make no further territorial claims . . . and then the fanatical voice of Hitler himself, in an address to Edward Benes.

Mr. Edward R. Murrow, noted reporter-analyst, is largely responsible for the compilation of Columbia Records new album of historical recordings. Mr. Murrow, an eye witness to many of the events covered in the album, is the narrator for this collection of actual recorded voices of the outstanding personalities who made history during the crucial period from 1933 to 1935.

Other voices tell of the invasion of Poland — Italy's entry into the war — the fall of France. And later the tense moments of December 7, 1941 are brought startlingly to life, with John Daly interrupting a regular musical broadcast, informing a shocked and horrified nation of the Pearl Harbor attack. Then there is the U. S. declaration of war — the tremendous impact of D-Day — the Nazi invasion of Russia — and finally Hiroshima and the Japanese Surrender.

This is but a suggestion of the full historic contents of "I Can Hear It Now." Not only does it bring back memories more dramatically than could possibly be done by the written word — it points out the as yet untouched possibilities that actual historical recordings can play in the educational field. It is to be hoped that this Columbia Album is but the first of many similar record collections which will be offered to the public. For there is certainly a wealth of this interesting and instructive material available — both in the extensive files of the recording and broadcast companies, and in the hundreds of thousands of disc recordings made by government agencies such as the OWI and the Library of Congress.

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disc-data for the Recordist

MICROGROOVE IN YOUR STUDIO

Part 2, Equipment Requirements

by C. J. LeBel, Vice President, AUDIO DEVICES, Inc.

C. J. LeBel

In our last issue we discussed the three steps in the transition from standard to microgroove recording, steps which may be taken by any recording organization.

In taking these steps it is necessary to make certain changes in equipment. The most important is provision for cutting at micro pitch — in the range of 224 to 260 lines per inch. Probably 224 to 240 lines is the most desirable range for most applications.

Some equipment already made has provision for this without change — that originally designed to provide continuous variation of feed pitch. In other apparatus some change is necessary. An overhead feed mechanism relies on a change of leadscrew for change of pitch. To make the shift, then, it is only necessary to purchase and insert a new leadscrew.

The swinging arm type of feed mechanism requires a little more effort. The feed action is produced by the operation of a worm and gear sector. The manufacturer of the machine can remove the worm and substitute another of different characteristics. He also has a removable worm arrangement so that the machine can be changed back and forth between micro and standard groove. The change is not as easy as desired, for the chassis has to be lifted up in the case. However, such a change is not one to be made often, and the arrangement is satisfactory.

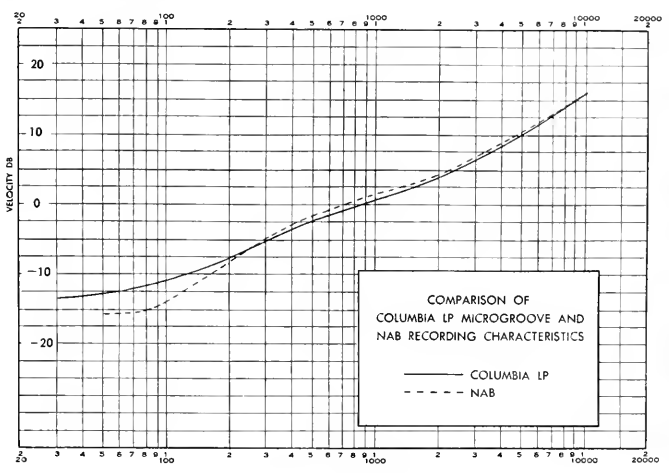
Some recording machines have too much vertical vibration to be used for microgroove, unless an advance ball is used. The machine manufacturer can advise on this point, and can supply an advance ball rig if necessary. Inexpensive semi-professional swinging arm feed type machines are most likely to need this attachment.

The electrical characteristics are even simpler to achieve. When recording regular 16" transcriptions with standard groove spacing and microgroove radius, we would use normal transcription recording characteristics. This would be either the NAB standard 16 db boost at 10,000 cycles) or the 10 db boost which many studios have found to be their usable limit. Columbia microgroove characteristic is the same as NAB, except that the response is slightly higher below 100 cycles. A simple equalizer will take care of this. For a great deal of work the difference is negligible, and standard transcription equalization can be used.

We have carefully refrained from commenting on the 33⅓ vs. 45 rpm situation. At the start, the average studio will have only 33⅓ rpm equipment, so there will be no question of choice. Only time and experiment will indicate whether 45 rpm will become a serious factor in the average studio.

It is evident that the transition to microgroove is an easy one from the equipment point of view.

The subject will be discussed further in our next issue.



Wendt's "Wax Works"

The Story of a Record-Making Musical Family

Bill Wendt, a 16 year old student at Thomas Jefferson High School, Richmond, Virginia, was one of the three talented students selected to appear on the Philharmonic Symphony's CBS program "Week End With Music," on October 17, 1948. That's how we first heard about Bill, who is not only an accomplished musician on the violin, piano, cello, string bass, and bells, but is also an up-and-coming recordist. As this is a rather unusual combination of talents, we felt that our readers would be interested in hearing about his recording activities. So here's the story in his own words, as quoted from his letter to the editor of Audio Record:

"I have been doing my own recording work for approximately ten months, having been introduced into this field by my oldest brother, Frank, who first became interested in audio work about seven years ago. When he entered the service he passed on to me his information on recording. While he was away my interest in this field grew considerably with the cutting of numerous discs, but as yet I have not had time to become well acquainted with the more technical side. All of the equipment was built by my brother with the exception of the recorder itself which is a Rec-O-Kut 16 inch recording table with the same make overhead feed; a combination that has served quite well considering the relatively low price. The cutter is a Presto 1-D which is driven by an amplifier using a pair of 6B4's and a UTC output transformer #LS 55. Fifteen watts, however, is not sufficient for recording piano with its ever-present peaks, and I am now helping Frank build a 60 watt amp. You see, this recording hobby is a sort of mutual

(*Continued on Page 4, Col. 3*)

Bill Wendt prepares to record one of his favorite orchestral programs in his home studio, at 4207 Monument Ave., Richmond, Virginia.

Report on "Madame X," RCA Victor's New 45 RPM Record

We have received a number of requests for information on the new RCA Victor 45 rpm record, "Madame X." No technical information has yet been released, but we have collected the available data on the subject. Here it is in brief.

X is a thin 7" pressing of pure vinyl. The center hole is large — about 1½ inches in diameter. Maximum playing time is 5½ minutes. Fine grooves are employed, and the playback stylus radius is 1 mil. Price is slightly under that of an ordinary shellac pressing of the same playing time. So far as we can tell, the recording characteristic is the same as that used on standard Victor records.

The large center hole permits the use of a special record changer of very interesting properties. The record stack is carried on the large size center spindle; there are no outside supports. As a result the changer is extremely compact and extremely rapid. Several observers have timed the change cycle at 1½ seconds. To simplify the mechanism, all discs are of the same diameter, regardless of playing time. Record changer manufacturers are getting ready for production, and it is rumored that the simplicity of the mechanism will permit a net price of $5.

The point which has aroused the widest controversy is the speed: 45 rpm. It is rumored that 33⅓ rpm was tried and discarded because of difficulty in securing reliable processing in mass production, when using the slower speed. A moment's consideration will show that for a given diameter, 45 rpm will give 35% higher linear groove velocity than will 33⅓ rpm. It would be possible to get the same linear groove velocity at 33⅓ rpm by increasing the outside diameter to 9½ inches, which would increase the vinyl cost 82% over the 7 inch size. In short, the higher speed is a means of exchanging playing time for wider frequency range and reduced tracking distortion (with a fixed outer diameter).

Our readers will be interested to know that RCA Victor's engineers have promised us an article on "Madame X" for our March issue.

ATTENTION RECORDISTS PROFESSIONAL AND AMATEUR

We know of a company that is interested in contacting recordist who can give part time work to recording in their localities. The recording would be on tape and arrangements can be made with this group to obtain the proper type tape machine for this work. Those interested should write the Editor, AUDIO RECORD, giving information as to their qualifications.

Two More Questions and Answers on LP Records

In the November issue of the "Audio Record" we asked if there was anything else our readers would like to know about LP microgroove records. Here are two of the questions received which we believe are of general interest and are not covered in the questions and answers previously given.

1. **Question:** Is more volume required in playing the new LP microgroove records on duo-speed record players because of the decrease of amplitude in the grooves?

   Answer: One needs about 3 db more volume.

2. **Question:** In what ratio is sound to surface noise compared to both LP and standard pressings?

   Answer: LP is about 15 db better than standard pressings. In other words, the sound to surface noise ratio being about 40 in standard pressings is 55 for LP.

Wendt's "Wax Works"

(*Continued from Page 3*)

affair between us; I learn from my brother by helping him.

The mixer unit shown employs three channels with 200 ohm T pads as mixers and has D.C. applied to the filaments. The W.E. 633A dynamic mike, G.E. variable reluctance cartridge, and a Jensen JAP-60 woofer-tweeter combination all add up to fine recording and listening. Other equipment includes several more amps of ten and forty watts, an audio oscillator, and a 5" scope, all built by my brother.

Our recordings from the radio are composed mostly of programs presented by the New York Philharmonic, N.B.C., Philadelphia and Detroit Symphonies. I prefer to record works that have never been issued by record companies; consequently, most of our recordings are unavailable elsewhere. I might add that our most prized recording is the first made on the present equipment. It is the "Symphony in A" by John Powell played by the Detroit Symphony. Mr. Powell has used this recording to make corrections on the copy of his score as well as for criticism. We were hoping to have the Philadelphia perform this work sometime this year, but evidently it could not be worked into their program.

I have made recordings of my own voice for speech practice, but Frank has made most of the recordings of our family. We are all musical, all six of us, which offers a lot of material for recording. Several months ago my other brother, Don, startled his friends by recording himself playing the flute, violin, clarinet, oboe, bassoon, and bass all at the same time. It sounded like a full orchestra.

Our record library consists of about 100 hours of classical music at 33⅓ on 16" discs, twenty or thirty albums of commercial records, and ten Columbia LP records which are very fine. My one big trouble is finding time to listen.

As yet I am not certain, but I will probably major in music on the string bass and try for a symphony position or go into radio production. Frank has definitely decided to make music and the audio field of electronics his profession, and I might add that he is now engaged in recording Virginia's foremost pianist and composer, John Powell, at the piano. Some of these recordings have already been pressed and released to the public. I am proud to say that they have been rated by critics as equal to any commercial piano recording released by the large companies.

Well — that just about covers the high spots. I hope it will be of interest to you and your readers.

P.S. I have yet to find a better disc than the red label Audiodisc, and I'm very glad that you have licked the humidity problem. That gave me problems, also."

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 5, No. 3 | 444 Madison Avenue, N. Y. C. | March, 1949

The How and Why of RCA Victor's New Record and Player

By D. D. Cole
Chief Engineer
RCA Victor Home Instrument Department

In the fifty years since the birth of the record and phonograph industry, many types of records and phonographs — of various sizes, revolving speeds, and design — have been developed. But for the first time in the history of recorded music, there has now been evolved a record with a matching player, a player with a matching record. RCA Victor's new music reproducing system for the home consists of the first record and player designed as complementary units — a combination which provides unprecedented quality, service and efficiency.

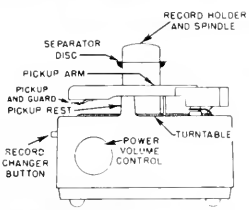
Our introduction of the new system was carefully considered. As the only manufacturer of both phonographs and records, we had a great deal at stake. We based our decision on our confidence that this system is the best we have ever put on the market, and our sincere belief that it is the best that anyone has ever put on the market.

We cast our future on a new recording and reproducing system that requires a new player and a different type record, but provides in return a record-changing mechanism that is free from the conventional troubles, and a record that provides a new high in reproductive quality, low cost, and convenient size.

We began, fifty years ago, with a simple record player—a single-play, manually operated player. Through the years, we have called upon the player to perform more and more difficult operations and services. The consumer wanted the player to handle large numbers of records, to change them automatically, and to be adjustable for records of various sizes.

While the industry was able to meet these requirements, it found that in meeting them it was running into new problems. Automatic changers were developed, improved, and simplified, but many difficulties persisted — perhaps chief among them the problem of damage to records during changer operations.

More than 10 years ago, RCA Victor began in its laboratories a program of study and development by which it hoped to solve, once and for all, the problems which had piled up on the industry since the beginning of recorded music. We were willing to stake our future on a system that would solve the problems still encountered with all conventional record changers and provide optimum reproduction quality, economy, and convenience.



RCA VICTOR'S NEW 45 RPM PHONOGRAPH AND RECORD — first in the history of the industry to be designed specifically to complement each other. Operation at 45 rpm provides up to 5 minutes and 15 seconds of playing time on each side of the small, vinyl plastic records, or up to 42 minutes when eight records are stocked on the automatic record-player, which contains the fastest record-changing mechanism ever devised.

Initially, we sought to do these things:

1. Provide a means of automatic record changing without damage to records.
2. Eliminate the need for adjusting a record changer for records of different sizes.
3. Reduce the time required for record changing and make the operation silent.
4. Eliminate from the overall player as many as possible of the conventional moving parts.
5. Reduce the overall size of the player and record, which we considered larger than necessary, and which required large phonograph cabinets and excessive record storage space.

We tackled the record changing problems. In most conventional systems, the drop mechanism operates from one or two posts located along the outer rim of the turntable. This calls for a large changer, since the post or posts, to handle 12-inch records, must be about 7 inches from the center of the turntable. It also calls for indexing mechanism so that the post can be adjusted to handle 10-inch, as well as 12-inch records. Changer blades in most conventional systems also present record chipping problems, since the design re-

(Continued on page 2, Col. 1)

audio record

VOL. 5, NO. 3 MARCH, 1949

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better disc recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

The How and Why (*Cont. from p. 1, Col. 3*)

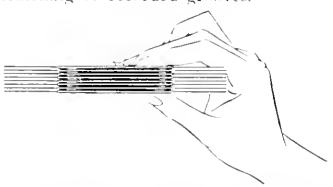
quires them to force themselves between the stacked records.

The solution soon became clear to us. We could not solve the overall changer and record problems by designing a new record to fit conventional changers, or by designing a new changer to handle conventional records. We had to design both a new record and a new changer, complementary units that together would eliminate the basic problems of record changing.

It was found that problems of size and indexing could be solved with a changer mechanism operated from the center of the record. By eliminating outside record posts, it was possible to reduce the dimensions of the player's motorboard from 15 to 11 inches to 10 by 7 inches.

Accordingly, we developed a changer with a drop mechanism which could be housed in a 1½ inch center spindle.

By designing our record with a raised shoulder between the playing area and the rim of the center hole, we were able to produce a wafer-thin disc that had the necessary rigidity, and provided air spaces between the center rims of the stacked records for the operation of the changer blades. The shoulder also provided air cushions between the playing surfaces, eliminating scratching of recorded grooves.



The blades of the new changer never touch the recorded grooves of the record. On the center spindle are two supports or shelves, which form the support for the record stack. When records are changed, the two shelves recede into the spindle, and simultaneously two changer blades move out through slots in the spindle and into the air space to form a shelf for all the records stacked above the bottom record. As the bottom record drops gently to playing position, the shelves emerge again to take over the holding job from the blades, which then disappear into the spindle.

Since the shelves are latch-type projections, records cannot be forced down over them, but records being removed from the turntable automatically depress the shelves as they are brought up over the spindle.

Through novel design, we developed not only a simple record-changing mechanism but the fastest one in the industry. On the underside of the turntable we designed a cam track that swings the arm up and out from the records, drops a new record, and brings the arm back to playing position in about two seconds.

The large center spindle and the design of the trouble-free drop mechanism called for the designing of a new type of record to fit our new player.

With our changer and player plans formulated, we turned our attention to the record. Our plans called for a record as unique in its characteristics as the player.

Again, let us look to the past. Here, the record, too, has undergone a steady evolution of progress and advancement.

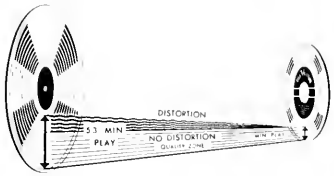
As we advanced from acoustic to electric recording, and from acoustic to electric pickups, recorded music became finer and truer. But, as we cut down some covering noise, such as motor rumble and needle chatter, record surface noise became audible.

Conventional records also posed other problems which we insisted on solving. Here are the objectives we sought:

1. Elimination of discernible surface noise and distortion, even at wider frequency ranges which may be used as better and better instruments are developed.
2. Reduction of the size and weight of records, making for lower cost, easier handling, more convenient storage, and faster and quieter action of the changer mechanism.

Distortion is caused by the inability of the stylus to track properly in the record groove. On standard records, this becomes more apparent as the stylus moves from the outside groove of the record toward the center.

Whether we use the standard 78 rpm, the conventional transcription speed of 33-1/3 rpm, or the new 45 rpm, the stylus will cover a greater distance in any given interval in the outside groove, and less and less as it moves toward center. Although the turntable revolves at a constant rpm rate, the stylus will track the groove at an increasingly slower linear speed as it approaches center. Beyond a certain point, the modulations are crowded so close together that the stylus has difficulty in tracking, and distortion results. The area up to that point in the record is called the quality zone, where there is no discernible distortion. Beyond that critical point on any record, of any size or revolving speed, distortion is set up and becomes more and more apparent, the closer the stylus moves toward center. We determined, then, that our new records would not be recorded past the critical point — the music would be recorded entirely within the quality zone of the record.



While we desire to reduce the size of the record, we also wanted to maintain the playing time associated with standard 12-inch discs — up to five and one-third minutes — and we wanted to put the entire five and one-third minutes within the quality zone of the record. We also wanted to eliminate the need for records of more than one size. We sought a one-size record that could handle all classifications of music — popular, classical, hillbilly, and rhythm.

Having established the size of our center spindle, we knew we required a record with a center hole 1½ inches in diameter. We had to allow space for the raised shoulder and the label, and additional space for the lead-out groove which carries the tone arm to the tripping point for operation of the changer mechanism.

The new step was to determine the minimum overall size required to offer five and one-third minutes of "quality-zone" music.

By scientific and listening test, we established the critical point beyond which we could not record without discernible distortion. With that point established, we began to buildout — to provide the smallest record providing the desired playing time. The tests indicated that our new record, to meet all of our goals, should be 6⅞ inches in diameter, and operate at 45 rpm.

We made our records of non-breakable vinyl plastic for minimum surface noise, and developed a tone arm that exerts only five grams of pressure on the record. The stylus has a .001-inch tip radius. The combination of fine-point stylus and light pressure makes for less record wear and a more sensitive pickup. RCA Victor's famous Silent Sapphire permanent-point pickup is employed in the new tone arm, though it is only approximately one-third the size of the standard Silent Sapphire cartridge.

We have been asked by those who are not familiar with record engineering why we did not design our new system for operation at the familiar home phonograph speed of 78 rpm or the conventional transcription speed of 33-1/3 rpm. The simple answer is that at either speed we would have been required to make a larger record thicker and without the raised shoulder feature, at 78, or larger in diameter, if we were to maintain the same quality level, at 33 1/3. Nothing would be

(*Continued on page 3, Col. 1*)

Questions and Answers on the New RCA Victor Record Playing System

(Prepared for Audio Record by RCA Victor)

Q. Why was the new RCA Victor Record Playing System developed?

A. With the advent of the automatic changer, mechanical difficulties were encountered because of the lack of standardization of records. The cost of repairing changer units, plus the inconvenience to the consumer, prompted RCA Victor to commission its engineers to develop a new system based on the following objectives:

1. To develop a trouble-free automatic mechanism for changing records.
2. To design a record with the following features:
   a. Distortion-free reproduction
   b. Minimum surface noise
   c. Maximum quality and tone
   d. Smallest practical size
3. To disregard all limitations or restrictions formerly placed on the designer of both players and records.

Q. Why 45 Revolutions per minute?

A. For the size record selected, and the extremely high quality standards adopted, it was determined mathematically that 45 rpm was the slowest speed that would accomplish the desired results.

Q. How does it work?

A. Contrary to present methods, the new system is based on the principle of a 7-inch record with the size of the grooves reduced, revolving at 45 rpm on a specially designed player, and reproduced by a lightweight jewel-point pickup. All of these factors contribute to greatly improved quality of reproduction.

Q. Why a 7-inch record?

A. The 7-inch record has many advantages: easy handling . . . small, efficient, attractive . . . no storage problems . . . sturdier product with less wear . . . same amount of music as recorded on a 10 or 12-inch record . . . the entire recorded surface limited to the quality zone.

Q. Is this a long-play record?

A. No, the new record has a playing time of up to five minutes twenty seconds within its "Quality Zone". . . undistorted reproduction . . . approximately the same playing time as standard records. However, with the development of the new RCA Victor rapid changer, the lapse between records has been greatly reduced.

Q. How does the new Rapid Record Changer work?

A. The changer operates entirely from the center hole of the record. The spindle of this changer, which is 1½ inches in diameter, houses the trigger action mechanism which drops the records swiftly and silently to the turntable below. The entire operation takes only *two seconds*! This is the world's fastest record changer — and also the simplest mechanically.

Q. Can I use this system with my present radio?

A. Yes, you may purchase an attachment which will play through your present radio or phonograph, regardless of make.

Q. What types of instrument will be available with this new system?

A. The new RCA Victor system will be available not only in the attachment which you can use with your present radio, but also in complete table model phonographs, table model radio-phonographs, console radio-phonographs, and console combinations with television, radio and phonograph. These instruments all have the famous "Golden Throat" tone system.

Q. How many records will the Changer hold at one time?

A. The changer accommodates 10 records, which change automatically without attention, providing up to 50 minutes of listening pleasure at one sitting.

Q. What type of Needle is used with this new player?

A. There is no needle. This system uses an improved "silent sapphire" permanent point pickup.

Q. How heavy is the tone Arm?

A. The tone arm exerts a pressure of only five grams on the record. Obviously this reduces record wear.

Q. Is it expensive?

A. No, the new RCA Victor system was developed with low cost in mind — both for the record playing equipment and the records themselves. As a matter of fact, the savings in record purchases will pay for the player in an amazingly short period of time.

Q. How much cheaper are the records?

A. Up to 33% in albums, and 24% in single records, depending on the type of entertainment you want.

Q. Will the fine grooves present a problem?

A. No. The records are so designed, with a center shoulder providing air space between each record, that the playing surfaces do not touch while the records are on the changer or in storage. Further, the large center hole and the size of the record itself permits easy and careful handling; fingers never need touch the playing surface of the record.

Q. Are all the records 7-inch?

A. Yes, all seven inch, a complete standardization of records, but there is a color code for each type of entertainment.

Q. What do you mean by a color code?

A. Each musical category will be recorded on a different color record. For example: Red Seal music — red record — Popular music — black record — Country and Western music — green record — Children's Entertainment — yellow record — Blues and Rhythm music — cerise record — International music — sky blue record — Popular classics — midnight blue record.

The How and Why (*Cont. from p. 2, Col. 3*)

gained by such a compromise, since use of the unique and vastly improved record changer would require a record of complementary design, regardless of operating speed. Since the advantages of the new system could only be made available to the consumer through the combination of a new record and a new player, there was no advantage in clinging to an old standard. This left us free to make the system in every respect the best ever developed at low cost.

As previously stated, RCA Victor will continue to serve the standard market by making all selections recorded for the 45 rpm system also available on 78 rpm records. To insure a smooth transition, we will also make Victrola radio-phonographs with playing facilities for both types of records, as well as instruments incorporating only the new system.

Summing up, then, we have in our new disc a record that provides up to five minutes and 20 seconds of music that is free from discernible distortion and surface noise, with every note recorded in the established quality zone of the record.

Having a standard size disc that will take both the popular and classical categories of music, we have eliminated the confusion of indexing changers and have gone a long way toward solving the record storage problem in the home, the warehouse, and the dealer's shop. The small record and changer will also permit an overall reduction in the size of console instruments and give the stylist unprecedented latitude and flexibility in cabinet design.

The changer itself has solved many of the problems encountered with conventional changers. From the consumer standpoint, this changer assures a gentle handling of precious records, and the blades cannot scratch, chip, or break the records. It also provides silent operation and the fastest changing action of any mechanism yet devised.

Our complete faith in the quality, service and merit of this new system is implied in the simple fact that we are planning around it our future in the record and phonograph business, in which we have the largest stake of any organization in the industry.

disc-data for the Recordist

MICROGROOVE IN YOUR STUDIO
PART III THE STYLUS

by C. J. LeBel, Vice President,
AUDIO DEVICES, Inc.

C. J. LeBel

We are continuing our discussion of the problems of microgroove recording with a study of the most difficult problem, that of the cutting stylus. It will be recalled that a recording stylus has a burnishing facet which "breaks" the cutting edge. This polishes the groove walls, removing some of the scratches of cutting, and making a quieter groove. The effect is just like that of the dulled edge (on a lathe tool) used to produce a shiny cut in turning metal. In 1942 the writer published a study† of the effect of the length of this burnishing facet on the high frequency response. The longer the facet, in terms of groove wavelength, the more the attenuation. A facet length of less than .15 wavelength produces no attenuation. While the original study involved transcription size grooves, undoubtedly the results are not far off when applied to microgroove, as we will do.

The data presented covers only the diameter effect produced by the facet — that is, the recording loss only. Reproduction by a stylus of finite size produces a reproduction diameter effect, which adds to the recording loss. Reproduction or tracing loss is fixed by the groove velocity and stylus size, and we can do little about it, so that recording loss is all that we can minimize.

The data is presented in terms of the relative loss, that is, the difference in diameter loss between 1,000 cycles and the frequency under discussion. There is a small loss at 1,000 cycles, too, but this can be compensated for so easily that it is not worth considering.

In modern transcription work, cutting at 136 pitch for a maximum of 15 minutes, we come in to a minimum diameter of 8 inches. We then observe the following:

Frequency, kc	8	8	8	10	10	10
Burnish length, mils	.4	.5	.6	.4	.5	.6
Attenuation, db	1½	3	4	3	4½	6

For ordinary transcription work, if we are willing to accept a loss of 3 db at 8 kc or 4½ db at 10 kc, at 8 inch diameter, then a facet length of .5 mil is the largest we can use. For those who wish to make transcriptions with a fine-bottom groove, for reproduction with either standard or micro stylus, we have available a stylus with small tip radius and restricted facet length, our type #14 SM (standard microgroove). This dural shank recording sapphire sells at the same price as our present #14 and can be resharpened at the same price.

†*Reference*. Properties of the Dulled Lacquer Cutting Stylus, C. J. LeBel, Jour. Acoust. Soc. Amer., Vol. 13, No. 3, pp. 265-273, January 1942.

Questions and Answers

(*Cont'd. from page 3, Col. 3*)

Q. How many selections are recorded on one side of the new records?

A. The records are recorded just as you are accustomed to hearing them on 78 rpm records, side for side.

Q. Will only RCA Victor make this new type record?

A. Other manufacturers, in addition to RCA Victor are planning to make this new type record. Others are planning to make the new player.

Q. Are you still going to make the conventional record?

A. Yes, all selections recorded for the 45 rpm system will also be available on 78 rpm records.

Q. How long did it take RCA Victor to develop this new system?

A. Research and experimentation began in 1939. By 1942 the first model was perfected. Then followed years of testing and refinement from which finally emerged the new RCA Victor record playing system.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 5, No. 4 | 444 Madison Avenue, N. Y. C. | April, 1949

Tips on Teaching the Teachers

by Evelyn Oelen
Director of Public Relations
State Teachers College
Montclair, New Jersey

I was very interested in George D. Griffin's article, "How to get the best out of Student Scripters," in the December AUDIO RECORD, and I was glad to see his viewpoint in print. Teaching radio writing and directing in a teachers college from a commercial standard, I too have used the limited outlook as an incentive to better student production.

Our college was asked to use NO sound effects when we first requested commercial station time to air our own scripts. That meant the station wouldn't operate any for us, not even recorded ones or music, because of their own personnel limitations. It was easy to make well-written transitions the price of going on the air. Later, when

(Continued on Page 2, Col. 2)

ABOVE — John Yaeger, student engineer assigned to the script writing class for the term, takes up a sound cue in the script with Mrs. Oelen, who seems to be on the writer's side. The college makes standard broadcast transcriptions of voice and music programs with the equipment shown.

AT RIGHT — Charles Fronzuto is double-chalked to keep him from booming on mike by Instructor Oelen as she sets up a test cut for scripter Eleanor Baker, waiting to interpret one of her own characters.

HOW RECORDINGS HELP THE HARD OF HEARING

Three students at the Franklin School, and Miss Anna May Lange, hearing instructor, listen to a recording made by Mary Anne Begalka, left. The greatest problem the hard-of-hearing must solve is speech deficiency. Elgin schools are helping their students overcome this difficulty with the aid of modern sound recording and reproducing equipment.

by Anna May Lange
Hearing Room
Franklin School
Elgin, Illinois

"Hor-ree' bul, perfectly hor ree' bul." Mary was working on the speech for a play we had written. We stopped and tried to correct her pronunciation of "horrible." Mary is hard of hearing. Her hearing loss is so severe that even with her hearing aid, she cannot hear speech as one with normal hearing does. She reproduces the sounds she hears. Unfortunately she does not hear the same sounds in the same way that we who hear do. One of the greatest problems for those working with the deaf and hard of hearing is to get normal speech from the auricularly handicapped persons. The disc recorder is a great help. By recording Mary's voice on an Audiodisc and then letting her hear the recording amplified we began correcting her "hor-ree' bul." Recognition of the problem was the first step. The second step was recognition of the cor-

(Continued on Page 4, Col. 3)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 5, NO. 4 APRIL, 1949

Teaching the Teachers

(*Continued from Page 1, Col. 1*)

we had proved ourselves, the station suggested we might like some of the effects in their library. But we never had to unlearn the art of writing footsteps!

Actual broadcasting also clarified another limitation — that is, to represent our institution in somewhat the manner the public would expect. Griffin's point about "demented souls" and the imitation of the local movie screen by new script writers gave me a satisfied laugh because students don't like to emphasize demented souls about the campus, so they write about useful, earnest, believable humans whom they know. Two and a half years ago when I first offered script writing here, our first commercial show was based on the visit of a *New York Herald Tribune* reporter to the campus to investigate our building needs. The next term we broadcast "A Campus United" dealing with good intergroup unity at Montclair. For this we got fanmail lauding us, as a state institution, for giving attention to this subject. At present we are waiting a 19 station schedule on this term's first show, written and produced in the class. It tells about the making of RESOURCES LIMITED at the College, a 16 mm. state conservation movie with the same title. Along with second year college and extension students in the class we used ninth grade demonstration high school students, who had helped make the movie, as actors. This is not only good radio experience for the teacher-in training but good educational experience as well.

In my classes I am not training professional radio workers. I am trying to develop the teacher-to-be in sensitivity to material at hand — principally the school environment — and in understanding how far average individuals can go in dramatizing situations which can be worked over into good scripts. In radio writing the student handles no equipment; student engineers are assigned to each class period and work with me. In radio directing students handle microphones, sound effects and tape recorders but not the cutting equipment.

We use recording constantly after the first few meetings in script writing to begin to work out central scenes from script ideas which have been brought in by individuals. As soon as we feel one or two of these are going to be good college broadcast material, the individual completes his writing and we commit ourselves to an actual station broadcast time. Usually the show goes on with little rehearsal, for we have built it together, and we understand thoroughly what we are trying to say to our audience. The best measure of our success is that we receive many invitations to be on the air, and that the college has provided us with more and more equipment until from one microphone in the faculty lunchroom for a studio, we now own half a dozen good ones, a Fairchild cutting head and table, AM-FM tuner, amplification units, and two Soundmirrors. A large classroom with director's booth and a smaller anteroom is now our exclusive studio space.

Occasionally we cut our own transcriptions for broadcast, although I prefer that the group works in various commercial stations where they learn a lot more as participants than they would if I just took them on observation trips. I buy 16-inch audiodiscs for all my work so that even in the early stages of working out scenes, different voice teams are on one record or different methods for solving scene problems are recorded close together for study. The large discs take our full fifteen minute shows when we are ready to produce a completed script. Each student is helped, as he feels he needs it, by voicing and discussion in class; he does his own casting and direction on interpretation for these trial records. He also does all his own writing.

Radio directing is taught alternate terms with script writing from the same point of view: that the teacher needs professional know-how to get and keep time for his students on the air. Auditioning, timing, cutting script, microphone perspective and sound effects, including music, are taught within the range of our equipment. Here recording is essential. I am surprised at the skill with which these student "directors" handle shows. They bring in their own effects, increasing our studio resources, and their own casts from outside the class, if they wish, and even from off-campus. In the near future I hope to offer local outlets not only student-written and student-acted shows, but also transcriptions that are student-directed. The student is asked to solve his own problems after the script choice has been passed on. He uses the studio extensively out of class time to prepare his dry run and cutting session which must be presented to the class as his course requirement.

It would be unfair to leave the impression that the radio classes, which are relatively small, are the cause of all the expansion in equipment which Montclair State Teachers College has had during my two and a half years teaching radio. The speech department uses 8-inch audiodiscs for beginning and end of term analysis for each student in foundations of speech, tape recording for reading for oral interpretation and in clinical work.

Mr. Howard Fox, drama instructor, heads the staff of student engineers who operate the studio. This group records many shows off the air and recently taped an hour mock trial at a teaching aids conference at the college. This is now being sold on audiodiscs. Mr. Fox and myself cooperated in transcribing four fifteen minute shows with commentary using our orchestra, trio, band and a cappella choir. We did this work over several hundred feet of wire with no amplifying unit, monitored over a field telephone connecting the library (used as studio) with the recording equipment in the basement. A major local station played these transcriptions last summer as a series and we are now offering them to smaller stations throughout the State. Thanks to making a public spectacle of ourselves on this job more people here understand the complexities of working with sounds. During the summer our music department moved from the main building to a temporary building about one-tenth mile from the recording studio. We are now tape testing the large bandroom in the new building and looking into wire prices to solve a new problem.

AER AND SCHOLASTIC MAGAZINES NATIONAL SCRIPT-WRITING CONTESTS CLOSE

It's all over now but the judging! The two nation-wide radio script contests, both sponsored by Audio Devices, have now passed their official closing dates, and the fate of the winners is in the capable hands of the contest judges.

The Scholastic Magazines' 1949 Radio Script Writing Competition, for high school students, closed on March 4th, and the Association for Education by Radio's National Script Contest, for college students, closed on March 31st.

Mr. William D. Boutwell of Scholastic Magazines, and Dr. Sherman P. Lawton, AER Contest Chairman, both report that the number of entries received has been most gratifying—that scripts from all parts of the United States continued to pour into their offices right up to the deadline. This tremendous response is indicative of the rapid growth of school radio workshops, and reflects the increasing student interest in the script-writing phase of radio work.

It is planned to announce the winners of both contests at the Institute for Education by Radio meeting which will be held in Columbus, Ohio, on May 5th, 6th and 7th.

disc-data for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

RECORDING TAPE TO DISC

C. J. LeBel

A new field for the recordist has broadened astonishingly in the last year. This is the practice of making recordings in the field on tape, then re-recording the material onto discs in the studio.

Using the light weight and improved quality of the latest tape recorders, and the erasable feature of tape, a considerable number of studios have made a very successful career out of recording professional and amateur orchestras, church choirs, and the like. Generally, a single recording will lead to the sale of twenty-five or fifty discs.

The erasable feature of tape is particularly helpful with groups which are not used to recording procedure. Errors can be edited out with a pair of scissors, or the tape simply re-recorded.

Fidelity Requirements

In re-recording the high frequency attention and distortion effects are additive, so that both tape and disc recorders must be better in quality than if either were used alone.

Home type machines appear very attractive for this work due to their light weight, but caution should be exercised. The older machines had excessive distortion and limited range. Some of the newer machines have excellent distortion characteristics, but the frequency response is uniform only to 5,000 cycles. Rebuilding such a machine, modifying the equalization to extend the frequency range, would appear attractive. Extending the frequency range probably will call for raising the bias frequency. This should be done carefully, to maintain the same bias current as nearly as possible.

System Adjustment

If the tape recorder is fitted with tone controls, these should be adjusted for the most uniform overall response. In most cases this means turning the high frequency control up all the way. The disc system should then be adjusted for most uniform response, plus preemphasis if used.

It occasionally may be desirable to vary the overall response, but this should be done with great caution. It is better to do such modification in recording, rather than in the original tape. A serious mistake, then, cannot ruin the original recording. Modification of response characteristics should be done very rarely, only if absolutely necessary.

Tape Recorder Improvements

While we believe it desirable to spend at least $400 for the tape recorder, there are many studios with limited budgets which will want to buy a lower priced machine and rebuild it themselves.

First, a 500 ohm output impedance is highly desirable. A simple change in out put transformer will take care of this.

Secondly, fit a volume indicator motor if the recorder is normally supplied only with a newon lamp for level indication. In this connection, remember that VU meters are available in small size on special order, and that they are much better than the old style general-purpose volume indicator which is more readily available in the smaller case.

Next; reduce the amplifier distortion by change of tubes or addition of negative feedback if necessary. Certain older home recorders need such improvement if they are to be used at all.

Finally, be sure to use a microphone of professional quality. The microphone generally supplied with a home recorder has limited frequency range and a strong peak. This change may require the addition of a pre-amplifier stage if the professional microphone has as low sensitivity as many do.

Tape Recording Level

Commercial tape recorders do not have as great signal to noise ratio as their laboratory prototypes, and lower cost home machines are, of course, poorer than professional units. Some home machines can be improved by rewiring, proper shielding, and correct position of ground connections, and time so spent is well invested.

Nevertheless, there is a great tendency to record at too high a level for the sake of achieving as high signal to noise as possible. The cure is worse than the disease. Tape recorded at excessive level seems to have a veil over the higher frequencies, and the effect is most objectionable. A home type tape recorder will have a usable signal to noise ratio of the order of 35 db, and a professional machine but little over 50 db if at all. Use the range available and be content. Do not try to stretch it at the expense of poor sound. The fault is no more excusable because it is so common. Pay no attention to the siren call of advertising literature with its ever louder claim of lower and lower noise levels. We have heard demonstrations in which the tape level was so high that heavy volume compression was taking place. Nothing will so quickly destroy the character of a recording as to have 10 db of the peaks removed by the compression action of overloaded tape. Summarizing, set your recording level by ear and meter tests, and not by catalog claims.

Photo, courtesy of Broadcasting Magazine

THE WINNERS: **Shown here, with President Truman at the White House, are the four talented winners of the "Voice of Democracy" contest. These winning student contestants, whose spoken essays were chosen from a total of approximately 250,000 high school entries, are, left to right—George Morgan, Jr., Hutchison, Kansas; Kerron Johnson, St. Paul, Minn.; Charles Kuralt, Charlotte, N. C.; and Richard Caves, Everett, Ohio. During a memorable week in historic Washington, these four boys each received a $500 scholarship and certificate, presented by Attorney General Tom C. Clark.**

The job of picking the winners was not an easy one—for voice and oral delivery were important factors in the selection. Preliminary eliminations in individual schools were started last November —after which came the community competitions. Later, the State winners were selected on the basis of transcriptions made by local broadcast stations. The final winners were selected from the winners of the State contests.

The "Voice of Democracy" contest was sponsored by NAB, RMA, and U. S. Junior Chamber of Commerce, with the support and cooperation of the U. S. Office of Education.

'49 SHOW TOPS 'EM ALL!

The 1949 National Convention and Show of the Institute of Radio Engineers, held March 7-10 in New York's Grand Central Palace and Hotel Commodore, chalked up a record-breaking attendance of over 16,000 persons. Prominent among the show's 225 exhibits, was The Audio Devices booth, shown above. Featured in the center panel are three gold-sputtered Master Audiodiscs of recordings made at 78 rpm (96 grooves per inch, 45 rpm (264 grooves per inch) and 33-1/3 rpm (224 grooves per inch), each accompanied by an actual shadowgraph magnifying a section of the recorded surface 250 times. Also displayed were the various steps in the manufacture of Audiodiscs — and the complete line of Audiopoints. At this booth, more than 2500 copies of Audio Records were distributed, and approximately 800 new "subscribers" were signed up.

(This Audio Devices exhibit will also be on display at The Radio Parts Show in Chicago, May 17-20, in Booth No. 24.)

Something New Under the Sun . . . and Stars!

The uses of Audiodiscs are manifold and multiform — some of them undreamt of in our philosophy. Here, for example is a most unusual application — quoted from a letter written to our editor by Philip W. Rhys, of Rhys & Walsh, Astrological Recordings, 330 East 32nd St., Brooklyn, N. Y.

"For the first time, Astrology has been combined with recordings. To some this may strike an odd tone. The general opinion of Astrology, born out of distorted knowledge (or none at all) of its principles, is that it is a sort of fortune-telling or witchery, about which everything is sort of vague.

When I was twelve years of age, I began my studies in Astrology. "Does one have to study it?" you may ask. Yes, indeed, for many years. Although this was an unusual age to begin, I advanced rapidly. I became more and more aware, through the years, that there was a higher type of Astrology, which is called Astrosophy. As I became convinced, as a matter of experience, observation and study, that Astrosophy was an art of a very high moral and educational nature, I also became awakened to the necessity of letting others know that Astrosophy existed. And surely there are few who know.

I had to find some way of impressing people with the difference between the rubbish handed out under the title Astrology, and the true material. I had to find a way of impressing upon people a respect for the true type of Astrology—Astrosophy.

I thought of the idea of making the character analyses and forecasts that the public was accustomed to, but a higher type of reading that is not charlatanry or fortune-telling. These I have made on recordings because the recording is able to do one thing that a book or picture cannot — it can carry the human voice with all its expressions and meanings to the ears of the listener. My partner and I started out with next to no knowledge about recording and have been continually delighted with the clarity and noiselessness of Audiodiscs. And so it is that recordings — Audiodiscs — have entered the century-long conflict of Astrosophy with its worst enemies — charlatans, and those who condemn without knowledge of what they condemn."

Hearing Helps (*Cont'd from Page 1*)

rect sound. From then on the work was merely routine drill.

"I sopped at the sore." Jim was alibiing for being late. Unbeknown to him, the Recordio was turned on, as it often is to catch natural speech of the youngsters. On being reminded that there was a 't' in both 'stopped' and 'store,' Jim insisted he had put the sound in these words. This was just another one of the many cases in which our problem is to show the student where his mistakes are. Once he recognizes his difficulties and is anxious to correct his faults, half the battle is over.

"Do you think I'll ever be able to talk right?" It's one of those gloomy days when one feels as though he has done nothing. Peggy is worried about her speech. We get out old recordings. We listen to recordings of her voice made last fall. She recognizes faults she has since cleared up. We play parts of recordings she has made throughout the year. "It doesn't seem possible I talked like that!" Peggy exclaims. If there were no recordings to prove it, Peggy would not realize she has made progress and that she can expect to continue to improve her speech.

Mary, Peggy and Jim are among the deaf and hard-of-hearing children who attend the public schools of Elgin, Illinois. In the old days, they would have been put in special classes. Now the handicapped attend school with their out-of-school friends. They are equipped with hearing aids and are in classes with teachers who understand their problems and work hard to help in their adjustments. They go to the Hearing Room once a day for individual assistance. Here they receive help in Speech and Speech Reading and are given Auricular Training and remedial help in any subject matter which is bothering them in their classrooms.

The Hearing Room is sound-proofed and very well equipped. Recording with Audiodiscs is frequent, as can be noted by the percentage of the time the sign *Recording* hangs from the door. The children like to record and we feel the benefit resulting is well worth the small cost. At Hallow'en the older children made a clever radio skit that we recorded and then played for the classes in which they were. At Christmas time each child made a record for his parents. Many parents told us that the recordings were the nicest gifts they received. The children had practiced to have perfect speech and the records showed the parents what we can expect of their children.

It's been a long time since education for the deaf in the United States was begun. It's been 135 years. Tremendous progress has been made during these years. Amplification of sound and recording of voice have played a great part in this progress.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 5, No. 5 | 444 Madison Avenue, N. Y. C. | May, 1949

SCRIPT CONTESTS ANNOUNCE WINNERS

Scholastic Magazine and AER Name Winners in Nation-wide Contests for High-School and College Students

The two big student competitions in radio script writing—Scholastic Magazines' 1949 Radio Script Writing Competition for high school students, and the Association for Education by Radio's National Radio Script Contest for college students—announced their respective winners at the annual luncheon of the AER, in Columbus, Ohio, on May 7th.

Both of these contests, which were co-sponsored by Audio Devices for the second consecutive year, drew an all-time record of entries. And, according to reports from the contest judges, entries were definitely up in quality as well as quantity.

Mr. William D. Boutwell, of Scholastic Magazines, reports that high school students entered a total of 440 radio scripts

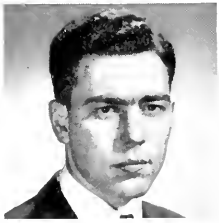
(*Continued on Page 2, Col. 1*)

WINNERS OF SCHOLASTIC MAGAZINES' RADIO SCRIPT WRITING COMPETITION

First Prize — Original Radio Drama. Richard Jackson, Jr., St. Clair Shores, Mich.

First Prize—General Radio Script. Elena Joan Svagzdys, Brockton, Mass.

First Prize — Radio Drama Adaptation. Margery Schneider, Forest Hills, N. Y.



WINNERS OF CLASSIFICATION 5 IN AER CONTEST

First Prize — Fred A. Brewer, Bloomington, Indiana.

Second Prize — Herbert Rube, Yonkers, New York.

Third Prize — Carl C. Naumann, Passaic, New Jersey.

Audiotape Now Available!

After 2½ years of research and development, Audio Devices offers a complete line of highest quality magnetic recording tape

Audiotape has the unique distinction of being both the newest and the oldest magnetic recording tape in this country. For Audio Devices first started work on the development of Audiotape more than 2½ years ago, at the time when samples of German tape recording equipment were first brought to this country for study and improvement. A plastic-base Audiotape which proved far superior to even the best German magnetic tape was produced well over two years ago. This tape would have been placed on the market immediately—except for one thing.

The product was *good*—but was it *good enough* to bear the "Audio-" trademark? Audio devices' engineers, acting as their own severest critics, felt that there was still some room for improvement, and that Audiotape should not be released until they were thoroughly convinced that it had achieved the highest possible degree of perfection in every respect. So additional

months of research and experimentation followed — to devise a still better, more uniform coating that would assure the finest, noise-free recording in a wide variety of machines, from low-cost amateur equipment to the most costly professional tape recorders. The problems involved in the perfection of Audiotape were more numerous and perplexing than the layman might expect with such a seemingly simple product. The article by Mr. LeBel, on pages 3 and 4, however, will give some idea of the complexity and magnitude of the task.

To meet the most rigid requirements, and to assure premium performance in a variety of different recording and reproducing machines, it soon became evident that two different types of tape would be needed. For the frequency response, output level, and signal-to-noise ratio bear a definite relation both to the bias current used in a particular machine, and to the coercive force of the magnetic oxide coating of the tape. Many non-professional type recorders on the market do not have a bias adjustment, and as the bias varies in different machines, a tape which would give optimum results with one machine would not give such good performance on a different, fixed-bias machine. Two different types of Audiotape were therefore devel-

(*Continued on Page 4, Col. 2*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 5, NO. 5 MAY, 1949

Contest Winners

(*Continued from Page 1*)

in the national contest alone—not counting the hundreds of scripts that were submitted for the 15 regional preliminaries throughout the country. This is by far the largest number of entries ever received for these Scholastic Writing Awards. Mr. Boutwell, who made the announcement of the Scholastic Award winners at the Chicago meeting, stated that there was a very marked increase in both the number and quality of scripts entered in Classification No. 3, General Radio Scripts—including many excellent examples of interviews, continuity, music, sports, and related subjects.

The AER Contest also chalked up substantial gains over last year's competition —with a greater number of entries, many of them of really professional quality. It is reported that the selection of the winners was a difficult one in both contests. And the judges report that most of the contestants show great promise of attaining successful careers in the radio writing field.

An unusual aspect of the AER contest was the fact that the second and third prizes in Classification No. 5 (Scripts for Home Recording—sponsored by Audio Devices) were both awarded to students in the same school—New York University. Still more significant, they were both instructed by the same professor—George D. Griffin, who also instructed the first, second, and third place winners of the same classification in last year's contest!

Following is a list of the national winners of the Classifications sponsored by Audio Devices in both the Scholastic Magazines' and AER Contests.

Prof. George D. Griffin of New York University tutored second and third place winners in Class 5 of 1949 AER Contest — and first, second, and third place winners in Special Class of 1948 Contest.

SCHOLASTIC MAGAZINES' Radio Script Writing Contest (High School Students)

Judges: Mrs. Gertrude Broderick, Director of Script and Transcription Exchange, Office of Education, Washington, D. C. Miss Judith Waller, Director of Public Service, N.B.C., Midwest. Robert P. Heller, Executive Producer, C.B.S.

Award Winners:

Original Radio Drama

FIRST PRIZE — $25; **Richard Jackson, Jr.,** 17, St. Gertrude School, St. Clair Shores, Mich.
"Sometime Tomorrow"
Teacher—Sr. M. Bernita, S.S.J.*

SECOND PRIZE—$15; **Neil Jackson,** 17, Redford High School, Detroit, Mich.
"The Dream"
Teacher—Marjorie Stevens

THIRD PRIZE—$10; **Juanita Pennell,** 15, North Sr. High School, Binghamton, N. Y. "The Janitor's Tale"
Teacher—R. D. Merchant

FOURTH PRIZES—$5

Louis A. Freizer II, 17, Stuyvesant High School, New York, N. Y.
Teacher—Mrs. Dobkin

Winthrop Griffith, 17, Burlingame (Cal.) High School.
Teacher—Fern Harvey

Doris Kummer, 17, Lutheran High School, St. Louis, Mo.
Teacher—Mrs. Constable

Richard McMahon, 17, Johnson City (N. Y.) High School
Teacher—Mrs. Sullivan

Marian E. Tyrrell, 17, Owego (N. Y.) Free Academy. Teacher—Mrs. Turner

General Radio Scripts

FIRST PRIZE—$25: **Elena Joan Svagzdys,** 18, Brockton (Mass.) High School
"An Imaginary Interview with G. B. Shaw". Teacher—Ruth T. Cosgrove*

SECOND PRIZE—$15: **Mary Carol Massi,** 16, Union-Endicott High School, Endicott, N. Y.
"High School Psychology"
Teacher—A. Alderson

THIRD PRIZE—$10: **Richard Wallace,** 14, Evanston (Ill.) Twp. High School
"The Story Behind the Label"
Teacher—Pierce Ommanney

FOURTH PRIZES—$5

Nancy Banks Bakke, 17, Montgomery Blair High School, Silver Springs, Md.
Teacher—Mary Wood

Jim Erickson, 15, Roosevelt High School, Minneapolis, Minn.
Teacher—Mrs. Doherty

David Kiplinger, 15, Redford High School, Detroit, Mich.
Teacher—Marjorie E. Stevens

Mary Jane Mills, 17, Union-Endicott High School, Endicott, N. Y.
Teacher—Mrs. Edna A. Finch

Joel Rankin, 17, Brockton (Mass.) High School
Teacher—Ruth T. Cosgrove

Radio Drama Adaptation

FIRST PRIZE — $25; **Margery Schneider,** 17, Forest Hills (N. Y.) High School
"Footfalls" by Wilbur Daniel Steels
Teacher—Mrs. Adele B. Tunick*

SECOND PRIZE—$15; **Barbara Kingsbury,** Battin High School, Elizabeth, N. J.
"Downfall of the Dalton Gang"
Teacher—Albert Komishane

THIRD PRIZE — $10; **Christine Dolores Dolsen,** 17, Cooley High School, Detroit, Mich.
"The Open Window" by Charles Dobie
Teacher—Leslie G. Carter

FOURTH PRIZES—$5

Mary Catherine Franklin, 18, Ancilla Domini High School, Donaldson, Ind.
Teacher—Sr. M. Lorenza

Myra Lou Hart, 16, Mackenzie High School, Detroit, Mich.
Teacher—Glendora Forshee

Ann Ivester, 16, Wyandotte High School, Kansas City, Kans.
Teacher—Mr. H. A. Billingsley

Enid F. Karetnick, Weequahic High School, Newark, N. J.
Teacher—Mr. I. Goldberg

Mary Ann Wershing, Academy of the Holy Angels, Fort Lee, N. J.
Teacher—Sr. M. Ellen

AER National Radio Script Contest (College Students)

Judge: Henry Lee Ewbank, Professor of Speech, University of Wisconsin

Classification No. 5. Scripts for Home and School Recording

FIRST PRIZE—$100; **Fred A. Brewer,** Department of Radio, Indiana University, Bloomington, Ind.
"How the Rocking Chair Got Its Squeak"
Teacher—Dr. Henry J. Skornia*

SECOND PRIZE—$60; **Herbert Rube,** New York University, New York, N. Y.
"Rendezvous"
Teacher—Prof. George D. Griffin

THIRD PRIZE — $40; **Carl C. Naumann,** New York University, New York, N. Y.
"Vallum Hadriani"
Teacher—Prof. George D. Griffin

*Received 25 Audiodiscs, 3 Sapphire Recording Audiopoints and 3 Sapphire Playback Audiopoints.

Audio Devices will again publish a collection of the prize-winning scripts from both the Scholastic and AER contests, which should be ready for distribution shortly after the opening of the new school year in September. Students whose work is selected for this purpose will receive special awards.

disc-data for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

RESEARCH PROBLEMS OF TAPE

C. J. LeBel

This paper discusses the problems faced by our Research Department in the course of our tape development program. The solution in some cases is visible in the statement of the problem. In the remaining cases a discussion of the answers would take many pages, and we will have to defer studying them until subsequent issues of the Audio Record.

Our Original Tape

About two years ago we brought out our Type A tape. This consisted of an oxide with a coercive force of about 120 oersteds and a remanence of about 500 gausses, coated on vinyl copolymer with a vinly acetate binder. The design was based on German developments brought over by the U. S. Department of Commerce, and was designed for 30 inch per second speed. It was decidedly better than the German tape as regards frequency range and signal to noise ratio.

Marketing experience with this tape showed that there were only about a half dozen professional machines (operating at 30 inches per second) in the whole country, but that there were many thousand amateur type machines, operating at 7½ inches per second, and requiring different bias characteristics. It was also evident that American recording machine design was developing differently than European, and that entirely different tape characteristics would be necessary in the future.

The American Trend

From the experience of those users who were rebuilding home machines into semi-professional jobs, it was possible to make an accurate estimate of the probable trend of design and operating practice.

It was evident that slower tape speed would be required. Thirty inches per second uses up tape very fast, and we guessed correctly that the professional standard would be in the fifteen to eighteen inch per second range. Late 1948 saw an NAB committee settle on fifteen inches.

At the same time we could see that wider frequency range would be necessary: to 7500 cycles at 7½ inches per second, and to 15000 cycles at 15 inches per second. A combination of the change in speed and the change in frequency range made the tape requirement three times as rigorous as European demands.

We could also see that equipment would have to run with less attention to head cleaning and the like.

The Basic Problems

With the basic assumptions made, it was possible to outline the basic problems for the laboratory. These could be allocated to the fields of: base, oxide, binder, dispersion and application.

Base

A plastic base would have to be found, with greater strength than the old vinyl, and which could be made in long lengths without splices. It would have to be perfectly smooth, and the thickness would have to be extremely uniform. It would have to be available in a thickness of .0015".

Paper Strength

We felt that if a very high grade paper base could be made it would be possible to use paper instead of plastic for many more applications, at a substantial saving to the customer. So the development of a special paper was put on the agenda.

Tape paper must have extremely good smoothness, for this improves frequency response and reduces noise and distortion. This smoothness must be inherent—in the type of paper machine and processing. It is easy to make a rough, porous paper, then fill the pores with white pigment. This makes a poor base, however. The white pigment tends to rule off onto the capstan, producing slippage. It is possible to bond the pigment to the paper by adding a plastic resin to the paper pulp in the beater. This tends to stiffen the paper. If too much resin is used, the paper is stiffened so much that it fails to contact the heads properly and high frequency response is impaired. It will also fail to wind compactly and the reel will be overfilled. If too little resin is used, the pigment will tend to rub off. The balance between chalking off and excessive stiffness is hard to maintain, and there really is no optimum compromise.

Knowing this, we decided to do it right—the hard way—and work with a papermaker on an unfilled paper of great smoothness. This would insure best frequency response, lowest noise and lowest distortion. We were correct in judging that this would be a long job—it was. Part of the problem lay in getting adequate breaking strength — five pounds — while still retaining all other desirable characteristics.

Oxide

As everyone knows, recording tape consists of a non-magnetic base coated with iron oxide. A wide variety of oxide chemical compositions and lattice structures are possible. Correspondingly, a wide range of magnetic properties are possible—a coercive force may be anywhere between say 90 and a maximum of 400 oersteds.

As was said before, wide frequency range was recognized as absolutely essential. It was also evident that low noise level would be required, to permit of as wide volume range as possible.

We guessed, correctly, that a wide variety of bias values would be in use, and that it would not be possible to get optimum performance at all conceivable biases with only one oxide. One oxide suited to high bias operation and another optimized for medium bias would be necessary. This raised another problem. Previous attempts at a high bias oxide had not been of professional grade due to excessive noise and modulation noise. The latter sounds like fuzziness to the ear and is highly objectionable. An improved high bias oxide was necessary.

One of the first handicaps in this work was the misleading nature of published studies on the relation of magnetic properties to recording characteristics. As applied to successive batches of a given oxide, coercive force and remanence have significance, but in comparing two entirely different materials the magnetic properties have but little more than a second order effect. Other factors may outweigh the magnetic properties in significance by twenty or thirty db. The need to actually coat and record on every experimental oxide was very time consuming, but in the end it proved worth while.

Binder

The iron oxide is held on the base by a binder. This binder must withstand high temperature without softening, if the tape is to be used on some of the earliest home type machines used by broadcasters. It must not have a tendency to rule off and foul the heads. Finally, it must not have a high coefficient of friction, or its motion over the heads will not be smooth. This coefficient of friction must not increase with time or use.

The friction must be reduced by proper formulation and not by roughening the coating. The slightest shade of roughness will reduce friction (a curious phenomenon), but it will impair output and high frequency response also. Do not confuse smoothness with gloss—a tape which is full of little bumps may still be very glossy.

Dispersion

An oxide works best if the individual particles are separated from one another by binder, just as the particles in a magnetic dust core are so separated. If the particles agglomerate together in clumps, the modulation noise increases. It was necessary to study the problem of dispersing

(*Continued on Page 4, Col. 1*)

One-Man Organization Turns Out Top Transcriptions

Radio-Video Associates, 322 East 55th St., a New York package agency actively engaged in the production of transcriptions for various non-profit organizations throughout the country has an office staff of one, in the person of 26-year-old Jack Lloyd, one of radio's busiest young actors. When not behind the mike, Jack spends most of his time carrying out his duties as R.V.A.'s producer, director, script editor, talent buyer and public relations man. By working as a one-man organization and hiring writers, artists, etc. for each individual project, he is in a position to produce his shows on a budget well within the reach of his clients. Except for a few spot announcements and talks, most of the shows which R.V.A. distributes to hundreds of stations are 15-minute transcribed dramas. Since Jack firmly believes in the power of a "name" to put across a message, he works hard to engage a Broadway or Hollywood star for his shows. Among the stars who most recently contributed their talents on shows for such worthwhile organizations as the Save the Children Federation, The Foster Parents Plan for War Children and The National Conference of Christians and Jews, are Margaret O'Brien, Madeleine Carroll, Peter Lawford and Ann Blyth.

Recordings are usually made at the NBC Recording Studios, and are processed by RCA Victor. These transcriptions are being broadcast by approximately 600 radio stations, which donate their time as a public service.

Producer-director Jack Lloyd discusses last minute details with film star Madeleine Carroll and announcer Len Sterling, before transcribing a drama for the benefit of the Foster Parents Plan for War Children.

Research Problems of Tape

(*Continued from Page 3*)

oxide in binder very carefully. Unlike the paint and abrasive industries, the problem of dispersion was one of perfection, not of speed.

The importance of the dispersion problem may be realized when we find that a poor dispersion will have 10 db more modulation noise.

The viscosity of the coating solution must be carefully controlled, lest it fail to apply properly in the coating machine. Every coating machine, of any type, requires exact solution viscosity for the most perfect results.

Application

This brings us to the problem of applying the coating. Recording tape coating is a precision job, entirely unlike that of coating sandpaper or adhesive tape. The tolerances are much smaller, for .0001" change in thickness will give over a db change in output.

We found, after checking test runs made on standard commercial coating machines, that none would give us the uniformity we felt was necessary. So we went back to the new type machine we had developed for our first tape, and concentrated on improving it still further. One of the problems, curiously, was that of measuring the tape thickness. When you start worrying about *fractions* of one ten-thousandth, you begin to have trouble with commercial measuring devices used in the shop. Regular measurements of a standard are necessary to check any drift in the gauge setting.

Conclusion

This has been a survey article, designed to show our friends why it took so long to develop the new tapes. We believe the time was fairly well spent, and expect to put a lot more time on still further perfecting the new medium.

Audiotape

(*Continued from Page 1*)

oped—one with a high-coercive, black oxide coating, and the other with a coercive, red oxide coating.

Now—after 2½ years of research, experimentation, and continual improvement—Audiotape is ready for the market. Audio Devices' engineers are confident that it is the finest product of its type available—a product that will, in every way, live up to the exacting standards of quality and uniformity which have characterized Audiodiscs for more than a decade.

Paper-base Audiotape, in both the high-coercive and medium-coercive types, is now in quantity production—in standard 1250-foot, all-aluminum reels designed to fit all makes of machines. Audiotape will be available through Audio Devices' more than 300 distributors, conveniently located from coast to coast. Through these distributors, it will also be available to retail dealers, who can obtain large or small quantities for profitable re-sale to their own customers. Distributors and dealers will be provided with complete instructions on the use of Audiotape—including recommendations on the type of tape which will give best results with all of the various commercial tape recorders now available.

Audio Devices is now working on a new line of plastic-base Audiotape, which will offer certain advantages for professional use. The new tape will be announced shortly.

Audiotape is now a full-fledged, tried and proven product. Its development was a "natural" for Audio Devices—a company with more than 10 years of experience in the manufacture and distribution of recording discs. For the production of recording tape has much in common with the production of recording discs. Both involve a precision coating process—wherein the sound-sensitive material must be applied to a suitable base in a perfectly smooth and uniform coating. Also, both involve the same basic principles of audio engineering, and call for the same high standards of quality control and continual factory testing to assure the most perfect sound recording medium available.

Like Audiodiscs, Audiotape "speaks for itself."

audio record

THRU SPEAK FOR THEMSELVES

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 5, No. 6 | 444 Madison Avenue, N. Y. C. | June-July, 1949

RECORDINGS HELP "VOICE OF AMERICA" PENETRATE RUSSIAN JAM SESSION

Discs and tape play important role in keeping the Voice on the air 24 hours a day

To news-hungry Russians, the Voice of America broadcasts, and those of the BBC, have long constituted the sole link with the world beyond the Iron Curtain. In an effort to weaken this link, Soviet transmitters started jamming the Russian-language broadcasts in February of last year. Up until about two months ago, however, these efforts were only partially successful. But now the Soviet stations are engaged in an all-out offensive to strangle the Voice of America before it can reach any Russian ears. And since the Voice refuses to be silenced, we are in what amounts to an international struggle for supremacy of the air.

The Russian jamming efforts take several forms — broadcasting assorted loud noises on the same wave length; broadcasting on a slightly different wave length, to produce a loud squealing "beat" of audio frequency; and broadcasting on a varying frequency which straddles the undesired wave length, resulting in a loud, pulsating whistle. The noises superimposed on the jamming waves include bagpipe squeals, ducks' quacking, and, more recently, a multi-tone signal of 8 musical notes at high power.

This full-scale program presented some real problems in the way of planning and executing effective counter-measures — a job which is in the capable hands of George Q. Herrick, chief engineer of the Voice of America programs. According to Mr. Herrick, our counter-offensive has so far employed five methods of attack.

First — keeping the Voice on the air continuously, 24 hours a day.

Second — using additional transmitters, and broadcasting on so many different frequencies that it is difficult to jam all of them. The voice now employs a maximum of 36 stations, and the BBC, 25.

Third — changing frequencies suddenly and often, at irregular intervals — keeping the "enemy" on the jump to catch dodging programs.

Fourth — using a new "de-emphasizing

(*Continued on Page 2, Col. 1*)

Here, in the Voice of America's recording room ⟶ in Manhattan, 70 per cent of the original program material is transcribed on discs and later broadcast to the Russian area.

"Ranger Bill" Rides Again

Station WNYE Transcribes Second Series of U. S. Forest Service Programs

Many of the students in the New York City Schools have never seen a real forest. Yet chances are, they know more about forestry than many of their country-bred brothers and sisters. For, thanks to the medium of educational radio, the students in 750 New York Schools have thrilled to the fascinating and instructive adventures of "Bill Scott — Forest Ranger." In this series of transcribed radio programs, Bill Scott, his young niece June Cameron, and two teen-agers, Joe McGuire and Sam Freeman, bring the tense drama and unforgettable lessons on forestry and forest conservation right into the classrooms.

The second series of "Bill Scott" programs, consisting of six fifteen-minute re-

(*Continued on Page 2, Col. 2*)

Cast of "Bill Scott — Forest Ranger" in rehearsal at studios of WNYE, Broadcasting Station of the Board of Education of New York.

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 5, NO. 6 JUNE-JULY, 1949

Voice of America

(*Continued from Page* 1, *Col.* 2)

and pre-emphasizing clipper," developed by Mr. Herrick and his assistants. Although this distorts voices somewhat, it makes the speech much more intelligible and harder to drown out with interference.

Fifth — Altering the program material to eliminate musical features, talks and documentaries, and transmit only news, news headlines, brief commentaries, press reviews and economic round-ups. In this way, if only parts of a program get through, they are sure to be vital and informative parts.

It is in the first of these counter-measures — the round-the-clock operation — that recordings play a vital role, both in the original programing and in repeat broadcasts. Present Voice broadcasts to the Moscow area are sent out from American stations on the following schedule—10:15-10:45 A.M., 2-3 P.M., 5-5:30 P.M. and 11:15-11:45 P.M. This represents a greatly increased schedule as compared to the pre-jamming days. But by the increased use of disc recordings, it has been possible to handle this added work load with existing personnel. Mr. Herrick states that about 70 per cent of the program material is aired from transcriptions, which are made whenever personnel and facilities are available, and put together later for broadcasting at the scheduled time.

Mr. George Q. Herrick, chief of the Engineering Section for the Voice of America.

Safeties of all programs are cut and filed for 24 hours. This gives back-up protection, so that if any of the European relay stations should fail temporarily and notify us of such failure, the remainder of the program could be broadcast from the safeties, direct from the Voice's American stations.

The four programs originating here are recorded by the American Relay Base at Munich, and rebroadcast from as many as 4 European relay stations during the periods that the American stations are not on the air. The programs are recorded at Munich on both disc and tape. As soon as the American broadcast is completed, the program is repeated locally by transcription. The disc recording is used first, as this is instantly available, without having to wait for rewinding, as in the case of the tape recordings. Subsequent repeats are made from tape. Duplicate tape recordings are used, so that one can be rewound and made ready for immediate airing as soon as the other has finished playing.

According to the present repeat broadcast schedule, the one hour program is aired three times, once direct from America and twice by local rebroadcast — two of the half hour programs are not repeated — and the remaining half-hour program is repeated for a total of 20 hours!

As to the effectiveness of our counter measures in this battle of the air waves, Mr. Herrick states that results are difficult to measure accurately. One thing is certain, however. Our Voice programs are forcing the Soviets to tie up a large part of their transmitter facilities for jamming operations. On May 25th, for example, BBC monitors actually located a total of 205 jamming stations on the air, and there were probably many more local jamming stations that could not be detected. At the same time, BBC reported that the Soviet Home Service programs were being aired over only 13 transmitters instead of the usual 25. Although it must be admitted that the Russian jamming operations are pretty effective in limiting the amount of Voice programs that actually break through, it is at best a Phyrric victory — extremely costly in both rubels and facilities.

Psychologically, it probably has just the opposite of the desired effect on potential Russian listeners — serving to arouse their curiosity and make them more anxious than ever to do a little surreptitious listening. Playing up this aspect of the situation, all of the Voice's Russian-language programs carry this punch line: "Obviously somebody considers it dangerous to let the Soviet people listen to truthful information from a free radio."

This war of the kilocycles isn't over yet — for Mr. Herrick hasn't exhausted his bag of tricks by any means. And even now, the Russians must realize that they are pitting their engineering skill against a worthy adversary.

"Ranger Bill" Rides Again

(*Continued from Page* 1, *Col.* 3)

cordings, is the result of the outstanding success of a similar series originally produced in 1946 — a series which received a special citation (highest award) at the Tenth School Broadcast Conference in Chicago, on October 28, 1947. The contest judges commended the programs for their effective combination of "exciting" forest drama with practical conservation messages.

The "Bill Scott, Forest Ranger" programs are written by Bill Bergoffen of the U. S. Forest Service, and are produced by student actors in New York City's School Radio Workshop, under the skillful supervision of Van Rensselaer Brokhahne, production manager for Station WNYE. New York City offers an excellent opportunity for putting such an educational effort into effect. For the New York Board of Education operates its own broadcasting station, WNYE, and with receiving sets in 750 of the schools, it has an air channel to every classroom. And to help the students get the most out of these U. S. Forest Service programs, 1500 teachers were provided with appropriate instruction material to supplement their own information in this field. Also, more than 6000 students were given special Bill Scott notebooks—collections of short and interestingly written articles on the various phases of forestry, forest conservation, fire prevention, reforestation, etc.

The use of the "Bill Scott" programs, however, is by no means limited to the New York City Schools. Hundreds of transcriptions have been distributed to radio stations, forestry groups, schools and colleges throughout the entire United States. They have been broadcast to homes and schools, and reproduced directly in classrooms and at summer camps. The scripts have also been widely used for local dramatization by student bodies.

Production of the second series of programs was begun early this year, and already, requests for transcriptions have been received from 23 states and Washington, D. C. Readers of Audio Record who would like to obtain transcriptions and complete sets of the scripts of "Bill Scott, Forest Ranger" programs for their own use, are requested to get in touch with Mr. C. W. Mattison, Forest Service, Washington, D. C.

AUDIOPOINTS "Speak For Themselves" Too

The following letter was received from Station WWL in New Orleans by one of our distributors, Charles A. Levie, Radio Parts, Inc.

This is the point — Recording Sapphire Audiopoint No. 14, magnified 4 times.

"Dear Charlie:—
The attached needle recorded its swan song in a burst of glory. It has been resharpened for the last time but the final resharpening recorded 104 sides of 16 inch records at 33 1/3 revolutions per minute. This amounts to 26 hours of continuous recording before breaking down. We think this is something of a record.
This is an Audiopoint and was used on Audiodiscs exclusively.

Yours very truly,
J. D. Bloom, Jr.
Chief Engineer"

disc-data for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

NEW METHOD OF MEASURING BIAS

C. J. LeBel

In keeping a tape recorder in top notch operating condition, and in adjusting a recording room full of machines so that all perform alike, it is very helpful to be able to measure the intensity of the supersonic bias at the tape. It is not enough to measure the bias current through the recording head, for successive heads from the same maker may differ 50% in the effect of a given current. One must measure the effective bias right in the tape itself.

This problem of measuring effective bias first came to our laboratory in the form of a need for data on the bias of various commercial machines. The difficulty was enhanced by the fact that various manufacturers use different core shapes and differing numbers of turns on the cores, in building their heads.

The first method tried was the old one of measuring the erasing effect of bias flux on a tape recorded to saturation. This proved to be somewhat indefinite, because a saturated signal is not as exact as one would think. A 99% saturated signal is markedly easier to erase than one which is 99.9% saturated, yet the difference in output between the two is less than one tenth of a db at the start. Other difficulties make the method still less reliable.

At this point in the research, the laboratory came up with an idea which has proven entirely successful. They spliced a few feet of tape (coated with red oxide) to a few feet coated with black oxide, and used the difference in output between the two (which varies with bias) as an index.

If we record on tapes coated with entirely different oxides, we get a result like figure 1. In making these measurements a mid-range frequency such as 400 cycles may be used, at fixed (normal) recording level. Bias current is varied and the tape output measured.

It can be seen that for bias currents under 7 ma, through this particular recording head, tape A has higher output than tape B. At higher biases, the situation reverses and tape B has higher output.

If we measure the difference between the two curves, we get a result like figure 2. This curve is taken from data on another pair of test tapes.

In order to determine the bias of any tape machine, it is only necessary to run the pair of tapes, measure the difference in output (both magnitude and sign), and refer to the calibration curve. The bias current of these curves is given in milliamperes through our laboratory head, but similar data can be secured on any recording machine equipped with adjustable bias, and a meter for reading bias current.

We have applied a test tape of this sort to a considerable number of recording machines, with results that will interest our readers:

Machine	*Equivalent Bias*
A (warm)	3
A (cold)	4
B	5
C	8
D	10
E No. 1	4
E No. 2	5
E No. 3	8
F No. 1	5
F No. 2	5.5

Machines A, B, C, D are very light, non-adjustable bias home style machines that have been widely used by broadcasters for portable work. An oxide that has adequate sensitivity on machine A (bias of 3 to 4) will lose high frequency response if run on machine D (bias of 10). An oxide that has good frequency response at a bias of 10 will distort badly when run at a bias of only 4. It is apparent that optimum results can be achieved by operating a machine with the correct tape for its bias characteristics.

Machine E is a professional type with non-adjustable bias, and the variation between machines is excessive. The designer's intention was to achieve a bias of 5 or 6, but the target has been missed in two out of these three trials. We strongly advocate the use of a test tape on all the machines in the recording room once a week to catch such variations as this. Machine F has adjustable bias, and the tests were run with the manufacturer's own bias settings. Evidently his machines are uniform.

Just one precaution in using one of these test tapes: be sure to use the same frequency for your test as was used for the original calibration of the tapes. A shift from 400 to 1,000 cycles, for example, will shift the current at which both tapes have equal response from seven ma to six ma.

It is possible to make up a test tape pair from any two dissimilar oxides, but optimum results are secured if the two curves are as different in slope as possible. Tapes we have used in our bias research program have therefore been prepared by the laboratory rather than the factory. If there is enough demand to warrant it, we may make test tapes and individual calibration curves available.

Acknowledgment is due Mr. E. W. Franck, Research Director of our Company, who devised this method of test and who has prepared the tapes used.

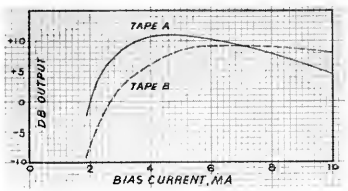


Fig. 1 — Bias Current Versus Output for Different Oxides.

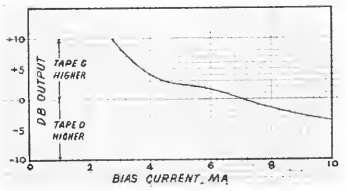


Fig. 2 — Output Difference Versus Bias Current.

"SELF-SERVICE SOUND" SELLS AUDIO COMPONENTS BY EAR

Sun Radio's push-button sales room gives instant comparison between ordinary and High-Fidelity reproduction

"Self-Service Sound," an unusual concept in sound demonstration, is featured in the new, 1000 sq. ft. Sound and Television Demonstration Studio of the Sun Radio & Electronics Co., Inc., 122-124 Duane Street, New York 7, N. Y.

By merely pushing a button, the shopper himself may select from 2600 possible combinations of audio components, including radio tuners, amplifiers, microphones, record changers, and speakers. This gives instant comparison between ordinary sound reproduction and full-color, High-Fidelity reproduction.

Behind this effective approach to the demonstration of sound equipment lies Sun Radio's "Sound Demonstration Control Panel," a master switching system designed by Irving Greene, I.R.E., Manager of Sun Radio's Sound & Television Department.

From both the practical and merchandising points of view, it was necessary to design a sound demonstration studio which avoided the usual plug-pulling, wire-raveling ceremonies which would otherwise be required in the demonstration of sound equipment.

High-Fidelity, in which Sun's new studio specializes, can best be demonstrated by *instant comparison* with ordinary reproduction. The new Demonstration Panel accomplishes this, at the same time making it easy and pleasant for the shopper, whether he be layman or engineer, to select the desired components. Leading equipment in all price ranges is displayed.

The speakers and record changers each have their own illuminating device to indicate which one is in operation. These lights work automatically as the equipment is switched on.

The studio has been deliberately designed to be neither acoustically perfect nor sound-proof. It is "sound-conditioned," that is, there is no attempt to demonstrate sound under such ideal conditions that the customer is disappointed at what he hears in his own home. Wall and ceiling have been constructed to keep external noise out, and to prevent studio noise from disturbing the rest of the organization.

DON'T BE BASHFUL! If you have any recording stories that you think would be of interest to our readers, send them in. Audio Record is now distributed, by request, to 1480 radio stations, 3950 schools and colleges, 3300 recording studios and recordists, and 950 distributors and dealers. Address contributions to: Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

Tuners, amplifiers, changers, and speakers are arranged for easy visibility and identification in Sun Radio's Sound-TV Studio. All can be demonstrated from the push-button control panel which can be seen in the photo. Not visible in this picture are the Recording and Television Sections.

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 5, No. 9 | 444 Madison Avenue, N. Y. C. | November, 1949

Prize-Winning Script of '49 A.E.R. Contest Broadcast Over 13 Stations

Tape Recording of "How The Rocking Chair Got Its Squeak" is Aired on Indiana University's "School of the Sky"

"How the Rocking Chair Got Its Squeak", the prize winning script in the 1949 Association for Education by Radio script contest, division five which was sponsored by Audio Devices, Inc., was broadcast this Autumn throughout Indiana, Illinois and Ohio on the Indiana University "School of the Sky" program.

The script, written by Fred Brewer, a graduate assistant at Indiana University, is one of many programs heard each week day by school children in the area covered by thirteen radio stations which air the series.

"The School of the Sky" is now in its

(*Continued on Page 2, Col. 1*)

Fred Brewer, writer of the script, points out where a time cut can be made to Fred L. Gerber, director.

Jack Bleasdale (left) and Richard D. Morgan act out a tense scene in the script. Jack is the friendly Old Bear telling the Young Maple Tree (Dick) just why he shouldn't rustle his branches so loudly.

George C. Johnson (nearest the camera) and Harry J. Skornia audit the program after it has been recorded on magnetic tape.

Student Recordists Get Early Start in Westfield Schools

Audiodiscs used in all phases of primary training

By William M. Mahoney, Principal
Moseley School, Westfield, Mass.

The Moseley School in Westfield, Massachusetts is well aware of the potentialities of disc recording in the elementary grades.

Much has been written concerning the virtues of using the recorded voice in the high school—for language study, speech, English, dramatic, and similar classes, sometimes to the point of minimizing the effectiveness of the device in the *elementary* school. However, the function of the disc recorder as an aid in early speech correction, oral reading, music, social studies, and as an excellent motivator in all phases of the elementary school curriculum is gaining added impetus throughout the country as the emphasis on the unit-activity method of instruction continues to be stressed. There is hardly a unit of work being taught in most courses of study for the first six grades, where the recorder cannot be used to great advantage.

Second graders at Moseley School record Fire Department Program on Yellow Label Audiodiscs.

The accompanying picture shows Teaching Aids Director LaDoyt K. Teubner and Miss Anna Lilhs, second grade teacher of the Moseley School making use of the recording session as a culminating activity on a unit of work about the fire department.

Several days of teaching, planning, and

(*Continued on Page 2, Col. 2*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 5, No. 9 NOVEMBER, 1949

Prize-Winning Script

(*Continued from Page 1, Col. 1*)

third consecutive year. Its programs, designed for in-school listening, cover history, news, science, books and guidance.

George C. Johnson is the general supervisor of the series, and Fred L. Gerber directs and produces all the programs which total 126 during a school year. Harry J. Skornia, chairman of the I. U. Department of Radio, originated the educational series which is now considered by educators as one of the finest programs offered to children.

The programs go not only to Indiana stations, but are broadcast in Chicago and Louisville; and the Minnesota Department of Education is distributing last year's series throughout Minnesota schools by electrical transcriptions.

This year "The School of the Sky" is making extensive use of magnetic tape recordings for the first time, and with much success. Tapes are sent to the radio stations one week in advance of the broadcast date.

The series uses only student talent.

Mr. Brewer, who wrote the "Rocking Chair" script, also writes the news program, and contributes scripts to the history and science series. Writing is an old business to him—a newspaper sports editor before the war, contributor to magazines, and the winner of several scholarships and prizes for his script writing, he plans making the writing of educational radio and television scripts his life's work.

Westfield Schools

(*Continued from Page 1, Col. 3*)

learning preceded the actual job of recording. Members of the fire department were invited to the class and demonstrated how a fire alarm is sounded. Many questions were asked and, from the answers, stories were written and the best ones chosen by the class. Then a similar process was undertaken to appoint readers for each story. Finally, the class, as a music activity, composed a song about the fire department and it was sung by the entire group for the recording.

What do we have now that the recording is made? Just another notebook or some bulletin board material to file away until next year? Certainly not! We have an addition to our library of activities for that room that is alive and real and which the children can and do play over and over for group and self criticism, for comparison, and for personal enjoyment. We also have another source of research information that other classes can use from time to time when they are studying similar material.

These recordings, besides being good stimuli to the children, make excellent public relations material at PTA, Woman's Club, Kiwanis, and other meetings. The playing of the recording mentioned above, to a PTA group resulted in the purchase of a new transcription player for us.

To be sure, we, in the elementary school are not going to be push-button teachers and either make or play records as our only diversion from traditional teaching, but we most certainly can and should use this excellent type of teaching aid to complement a well-rounded school program.

Which Twin Has the Tonsils?

Although we hear our own voices every day, few people know what they *really* sound like—until they make a recording. The result is usually quite a surprise. Here's a typical case in point, submitted by Mr. William S. Tacey, Assistant Professor of Speech at the University of Pittsburgh.

"Recently I was recording the voices of the students in a class in Public Speaking. After several people had spoken, we started the playback. The first voice was that of a girl. As she heard her own words coming back she turned to me with a quizzical look and said, 'Why, that's my *twin's* voice! When did you record her voice?' I asked her if she was sure. She replied, 'Yes, I'm very sure. We are identical twins but our voices are much different.' It required a second recording to convince her that her twin's voice was not the one that she was hearing over the machine."

audio pointers for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

A TAPE POLL

C. J. LeBel

While the rest of the country has been occupied with a mere political election, we have been checking into another type of preference—for tape. We have been busily checking the recommendations of tape recorder manufacturers, and so this issue presents the first published table of recording machine tape requirements—direction of wind, type of oxide and base material.

It is interesting to examine these recommendations in the light of possible industry trends. We note that of 23 manufacturers, 18 use the oxide-in style of wind. This surely registers an overwhelming preference—78%—and we can only hope that the remaining 22% will fall in line in future models. In the meantime, the manufacturer and dealer have to stock every variety of tape in both styles of wind.

When we come to the question of oxide, the matter becomes one of engineering choice, rather than random draftsman's whim. Seventeen have preferred red oxide, 4 take black and 2 have compromised with both.

For base material 16 take plastic, 4 take paper and 3 have compromised.

Without having conducted any extensive survey, we strongly suspect that many of the designers who picked red oxide did so mainly because they had to take it if they wished a plastic base. Now it is possible to get plastic base, paper base, black oxide and red oxide in any combination. This opens up certain possibilities not hitherto feasible, and should induce the engineer to do a little experimenting.

A little listening has convinced us that on the highest grade professional machines the difference in sound between plastic and

paper base is not as great as results from the less perfect bias waveform of poorer machines. We would suggest, therefore, that the large radio station reduce its capital investment in tape by using red oxide paper base tape for legal record recording. There is no reason why a tape of a quiz show, destined for filing for three months before final erasure, should be temporarily stored on the same high quality material as is used to preserve a world famous artist's performance for posterity. Since the same oxide is used on both bases, the machine bias will not require readjustment. In many ways this parallels the disc recordist's practice of using a Red Label blank for important work, and a Yellow Label or Reference disc for less significant recordings.

Another possibility opened up by our complete line is of help to the owner of a home machine designed to use black oxide. For his most important recordings he can use Audiotape No. 1240 or 1241 which are combinations of plastic base and the black oxide he needs.

So, by making a *complete* line of tape available, we make it possible for the engineer to use whatever type best fills his needs for the job in hand.

TAPE RECORDER	MANUFACTURER	RECOMMENDED TAPE		
		Base	*Coating*	*Wound with*
AMPEX	Ampex Electric Corp., 1155 Howard Avenue, San Carlos, California	Plastic	Red Oxide	Oxide Coating In
AUDIOGRAPH	Audiograph Co., 1434 El Camino Real, San Carlos, California	Plastic	Red Oxide	
RE-CORD-O-FONE	Bell Sound Systems, Inc., 1183 Essex Avenue, Columbus 3, Ohio	Plastic	Red Oxide	
SOUNDMIRROR	Brush Development Co., 3405 Perkins Avenue, Cleveland 14, Ohio	Paper	Black Oxide	
EICOR	Eicor, Inc., 1500 W. Congress, Chicago 7, Illinois	Paper	Black Oxide	
FAIRCHILD	Fairchild Recording Equipment Corp., 154th St & 7th Ave., Whitestone, N. Y.	Plastic	Red Oxide	
LEKAS	Lekas Mfg Co., Ann Arbor, Michigan	Plastic	Red Oxide	
MAGNECORDER	Magnecord, Inc., 360 N Michigan Avenue, Chicago 1, Illinois	Plastic	Red Oxide	
MASCO	Mark Simpson Manufacturing Co., Inc., 32-28 49th St., L. I. C. 3, N. Y.	Plastic	Red Oxide	
PELCO	Pelco Industries, 629 Second Avenue, New York, N. Y.	Plastic Paper	Red Oxide Black Oxide	
PRESTO	Presto Recording Corp., P. O. Box 500, Hackensack, N. J.	Plastic	Red Oxide	
RCA	Radio Corp. of America, RCA Victor Div., Front & Cooper Sts., Camden 2, N. J.	Plastic	Red Oxide	
RANGERTONE	Rangertone, Inc., 73 Winthrop Street, Newark 4, N. J.	Plastic	Red Oxide	
REVERE	Revere Camera Corp., 320 E. 21st St., Chicago 16, Ill.	Plastic or Paper	Red Oxide	
Rack Mounted Recorder, PORTATAPE & MINITAPE	Stancil-Hoffman Corp., 1016 N. Highland Ave., Hollywood 38, Calif.	Plastic	Red Oxide	
TAPETONE	Tapetone Maufacturing Corp., 1650 Broadway, New York 19, N. Y.	Plastic Paper	Red Oxide Black Oxide	
EKOTAPE	Webster Electric Co., Racine, Wisconsin	Paper	Black Oxide	
RECORDIO	Wilcox-Gay Corp., Charlotte Michigan	Paper	Black Oxide	
TWINTRAX	Amplifier Corp. of America, 398 Broadway, New York 13, N. Y.	Plastic	Red or Black Oxide	Oxide Coating Out
ULTRATONE	Audio Industries, Michigan City, Indiana	Plastic	Red Oxide	
MAGICTAPE	Crestwood Recorder Corp., 218 S. Wabash, Chicago 4, Ill.	Plastic	Red Oxide	
DUKANE	Operadio Manufacturing Co., St. Charles, Ill.	Plastic	Red Oxide	
ASTRASONIC	Pentron Corp., 611 W. Division Street, Chicago 10, Ill	Plastic	Red Oxide	

Tape Recordings Invade Literary Field

Tape-Recorded Interviews Used as Editorial Feature in "Journal of Metals"

When Mr. T. W. Lippert, Editor of the Journal of Metals, and Manager of Publications for the A.I.M.E., called on Henry Kaiser for an editorial interview, the usual note pad and pencil were conspicuously lacking. Instead, Mr. Lippert carried a Crestwood portable tape recorder—set it up on Mr. Kaiser's desk—plugged it into a power outlet—and started shooting questions at the famed industrialist. These questions, and the answers, in Mr. Kaiser's exact words, appeared as an editorial feature in the September issue of the Journal of Metals, under the heading "Henry Kaiser Says . . . (a tape recorded interview)".

Mr. Lippert has long been a proponent of the direct interview technique of editorial reporting. And he has tackled the job from every angle. Trying to jot down a person's words in abbreviated longhand was too slow—and not accurate enough. He has tried taking a stenographer along to record the conversation in shorthand. But the presence of a third party was not always desirable, and inhibited a free and natural flow of conversation. Also, this method of transcribing was not 100 per cent accurate either—especially when the dialogue was rapid, as is apt to be the case when a man really warms up to his subject. The tape recorder, on the other hand, has proved the ideal solution to the problem. Easily portable (weighing considerably less than the average stenographer), it assures an accurate word-for-word picture of the entire conversation—recorded in no more time than it takes to tell it.

To simplify transcribing interviews from tape to typewriter, Mr. Lippert has had his recorder equipped with a special foot switch attachment which plugs into the machine, and controls the tape drive. During transcription, the playback circuit is kept energized and the typist uses the foot switch to start and stop the tape as desired. It has been found entirely satisfactory to use the loudspeaker included in the equipment for transcription, without the need for a headphone attachment.

These tape recorded interviews have been adopted as a regular feature of the monthly Journal of Metals, at present appearing in every other issue. For the November issue, Mr. Lippert and his tape recorder have recently completed a tour through the Youngstown, Cleveland, and Pittsburgh areas, where he interviewed about twenty strikers picketing steel plants – getting their first-hand reactions not only on the strike, but on associated problems as well. As his recorder had to be connected to a power source which was not available on the picket lines, Mr. Lippert set up his equipment in a nearby barber shop or garage, then engaged the pickets in conversation and withdrew them one at a time from the picket line to his temporary "field headquarters". He states that the novelty of the tape recorder, and the instant playback feature, were a big asset in eliciting the cooperation of the strikers. They got quite a "kick" out of listening to the playback, and hearing their own voices probably for the first time in their lives. They were also fascinated by the fact that their interviews were being recorded on the same reel of tape which contained the interview with Henry Kaiser—parts of which were played back to them before they went "on the tape".

Mr. T. W. Lippert, editor of Journal of Metals, gives Ruth Garratt some helpful hints on transcribing a recorded interview from tape to type.

Mr. Lippert states that he selected tape instead of wire for this recording project, in order to obtain higher fidelity, more natural voice quality for easier transcription, and greater strength, with freedom from danger of breaking and snarling of the recording medium either during recording or playback. The Crestwood recorder which he uses is a dual-channel unit with a recording speed of 7½ inches per second, providing up to one full hour of recording on a 7-inch reel of tape. This is more than adequate for any interviews which he expects to make.

Just as "the pen is mightier than the sword"—so tape recording has proved itself mightier than the pen, at least for this type of article.

Quick Facts on Two More New Tape Recorders

(Additional information can be obtained by writing to the manufacturer)

EICOR, INC. • CHICAGO

Model 15
Portable

$134.95

Portable, dual-channel recorder with 7½" per second tape speed, giving 1 hour of continuous recording on a 7" reel. Replaces original Eicor Model 1000, with addition of more simplified controls, time markings, faster re-wind, and jacks for professional recording and reproduction. Weight, 27 lb.

PELCO INDUSTRIES

629 Second Ave., New York 16, N. Y.

SOUNDMASTER
Model 44

Price to Distributors Around $85.00

List Around $150.00

Portable, single-channel recorder with tape speed of 3¾" per second. One hour continuous playing. Frequency response (3 db), 80-5000 cycles. Percentage of WOW, 0.2%. Rewind time, 3 min. 6½" PM Speaker. Neon lamp recording indicator. By adding tone arm, machine can be used as 78 rpm phonograph. Weight, 38 lb.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 5, No. 10 | 444 Madison Avenue, N. Y. C. | December, 1949

SOUNDS—he brings 'em back alive!

A good reporter is said to have a nose for news. But Thomas J. Valentino, not being a reporter, can afford to be different. He has a nose for noises! In fact he has spent the past fifteen years collecting them — not merely as a hobby, but as a fascinating and profitable vocation. Proof of this is the fact that the sound effects catalog of Thomas J. Valentino, Inc., New York City, lists disc recordings of over five hundred different noises — "From a cat's meow to a lion's roar — a pistol shot to a world war."

That quotation, incidentally, is Mr. Valentino's trade slogan — one that gives a pretty good idea of the scope of his collection. There are soft, peaceful, pastoral sounds — like the chirping of crickets and croaking of frogs in the dead of night. Busy, active, crowded sounds — like the din of heavy traffic in New York's Times Square. Quick, urgent sounds — like the fast, rhythmic clack-clack of a battery of teletype machines in a busy news room. Exciting, dangerous sounds — like the staccato barking of a machine gun and the whine of ricochetting bullets.

Name just about any kind of sound you can think of, and chances are you'll find Mr. Valentino already has a recording of it. Take *bells*, for example. He can give you ambulance bells, burglar alarm bells, church bells, dinner bells, door bells, fire alarm bells, locomotive bells, telephone bells, ship's bells, and even the melancholy clang of a bell buoy. Or, suppose you want airplane noises. Take your choice of these: Air-cooled motor, fast; airplane crash; dive bombers diving for attack, zooming; Navy bi-plane; PB-40, zooming; twin-motor transport; fast bomber; flight; landing; propellers winding; squadron takes off; squadron passing; start motor; starts, takes off, flies; stunting; take-off, tri motor; twin-engine bomber; twin engine bomber, one engine missing. And of course there are all the associated sounds, too — like air raid sirens, falling bombs, crashing buildings, ack-ack, etc.

Mr. Valentino explains that his sound effects recordings sound so real because they *are* real — recorded from life on sound film, then re-recorded on Audiodises in the studio.

(*Continued on Page 2, Col. 1*)

Thomas J. Valentino, America's No. 1 Noise Maker, spins a platter of one of his five hundred different sound effects.

Two Audio-Sponsored Script Contests Seek New Talent in Student Writers

For the third consecutive year, Audio Devices is sponsoring both the Scholastic Magazines' and AER radio script writing contests for 1950.

These two nation wide competitions — Scholastic Magazines' Radio Script Writing Contest, for high school students, and the AER National Radio Script Contest for college students — offer all aspiring (and perspiring) scripters an excellent opportunity to win valuable cash awards, and still *more valuable* recognition for their creative talent.

As the trend, for the past two years, has been steadily upward — in both quality and quantity of scripts submitted — it looks as though the 1950 contests will pass all previous records in both respects.

So come on, students — sharpen your pencils and your wits, and start now to lay a foundation for your future career as a radio script writer, by entering the Scholastic Magazines' or AER contest.

Complete rules and instructions for the high school students' contest have already been published in Scholastic Magazines, so they will not be repeated here. But don't forget that the closing date for the National Contest is March 1, 1950. And if you're entering one of the many Regional Contests, scripts must be submitted by around February 15th — which can sneak up on you mighty fast.

The National AER Contest, in which Audio Devices is again sponsoring the Special Classification of Scripts suitable for home recording, will close on March 30, 1950. For complete rules and instructions for preparation of scripts, write to Dr. Sherman P. Lawton, AER Script Contest Chairman, University of Oklahoma, Norman, Oklahoma.

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 5, No. 10 DECEMBER, 1949

SOUNDS: (*Continued from Page 1, Col. 1*)

On Record No. 5031A, for example, you hear the sound of subway turnstiles, the rumble and roar of an approaching subway train, the click of the wheels on the rails, the hissing of air brakes, the opening of the doors, the surging shuffling footsteps and grunts of the passengers getting off and squeezing on, the closing doors, the train starting up and rumbling away into the tunnel again. This recording was made in the Lexington Avenue subway station at 116th Street. Mr. Valentino's recording equipment was parked in a station wagon near the entrance, and he carried the microphone on a long line right down to the platform. This is realism — for nothing sounds quite as much like a subway train as a subway train!

It's not always an easy matter to get exactly the sound effects he wants. In making recordings for the Broadway show, "Casey Jones", for example, he was asked to reproduce the sound of a locomotive hurtling along at 90 miles an hour. Valentino finally got the New York Central Railroad to "loan" him a locomotive and a mile of straight track at Harmon, New York. But even that didn't solve the problem, for the engineer said the best speed he could possibly develop in that distance would be a scant 60 miles an hour (provided the engine would hold the rails). Not to be daunted by such a technicality, he had the rails coated with grease. Then the locomotive rolled along at 40 miles an hour, with the wheels spinning madly at 90 miles an hour or better! This was one of Mr. Valentino's favorite assignments — one, incidentally, on which he was accompanied by Mr. William C. Speed, president of Audio Devices.

Once, when selecting sound effects records for the Broadway production "The Farmer Takes a Wife", playwright Marc Connelly wasn't exactly satisfied with the numerous "baby crying" records. "I want something like this", he explained — and proceeded to demonstrate by emitting a most realistic infantile wail. Whereupon Valentino grabbed a mike, asked for a repeat performance, and recorded it on

(*Continued on Page 3, Col. 2*)

First Audio Fair Outstanding Success

C. J. LeBel, retiring president, honored for contributions to Audio Engineering Society

The Audio Engineering Society's Audio Fair and first Annual Convention was held in New York City on October 27, 28 and 29. This, the first convention and exhibition devoted entirely to audio equipment, occupied the entire 6th floor of the Hotel New Yorker. The 56 exhibitors each had private rooms in which were displayed their latest equipment.

One of the high spots of the convention proceedings was the presentation of the Audio Engineering Society Award to C. J. LeBel, vice president of Audio Devices, in recognition of his many contributions as one of the founders of the organization and its first president. Mr. LeBel was succeeded by Theodore Lindenberg, of the Fairchild Recording Equipment Company.

The Audio Fair chalked up a total registration of 3,022 — more than four times the membership of the sponsoring organization. Attendance at the technical sessions averaged 250. Exhibitors, visitors, and members of the Society all evinced great enthusiasm — which augurs well for an even bigger and better Audio Fair in 1950.

The Audio Devices exhibit featured the new plastic-base Audiotape which at that time had just been released to the trade. Demonstrations of recorded music on both plastic and paper base Audiotape gave eloquent proof of the fidelity, brilliant high-frequency response, uniformity, and freedom from background noise and distortion which are made possible by this new and perfected recording medium.

Tomorrow's Hucksters Taught with Tape

— in new radio advertising course at Montana State University

Sterling Soderlind, Montana State University journalism student, places a tape of his 13 radio commercials on the recorder as Prof. O. J. Bue (left) and Larry Wilkinson, (right) another member of the class, prepare to listen. After the tape has been played, they and other class members will participate in a critical analysis of the recording.

A course in radio advertising is being taught for the first time this fall at the Montana State University Journalism School, Missoula, Montana. Prof. O. J. Bue is in charge of the course — "Radio Commercials".

Students in the class learn the theories of radio selling and get considerable practice in the preparation of commercial copy. They each prepare and make tape recordings of a series of 13 commercials for each of 12 different products. The copy will be submitted to local stations for criticism and suggestions.

An extensive collection of recorded commercials also is used for classroom analysis. In another phase of the course the young writers study the report on radio advertising recently prepared by Joske's of Texas. Audience studies and analyses of listening habits also come in for consideration by the students. All the students have completed a course in principles of advertising.

Professor Bue, veteran journalist, is one of the first journalism teachers in the United States to be selected for a summer radio internship. He served at Station KVOO in Tulsa, Okla., in 1945. He has taught the radio journalism courses at MSU — newscasting, radio editing, and special events — since their inception.

audio pointers for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

MODULATION NOISE

C. J. LeBel

Tape recording is afflicted with a species of noise which is of no practical significance in disc recording. Sometimes it masquerades as distortion, sometimes as ordinary ground noise, but in any case modulation noise must be suspected.

We may distinguish between ordinary ground noise and modulation noise when we recall that the former is constant in intensity, whereas the latter varies with the signal and is modulated by it. In Fig. 1 we have exaggerated the effect for greater clarity. The ear interprets this as distortion, for the result has been the creation of innumerable intermodulation products which make the tone fuzzy.

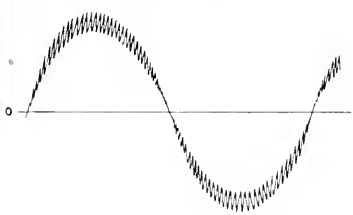


Fig. 1. Showing how modulation noise is superimposed on signal.

Modulation noise is a function of the character of the oxide and of the uniformity of coating. Many of the natural oxides seem to be very bad in this respect. Since they also seem to be rather poor recording media, this additional fault poses no special problem. Synthetic oxides with good recording characteristics seem satisfactory as regards modulation noise, and indeed certain procedures that lead to best results in one respect also are beneficial in the other.

Variation in coating thickness will also introduce modulation noise. Perfection of the coating surface in contact with the base material is determined, of course, by the smoothness of the base, and a plastic-base tape, therefore, has about 15 db less modulation noise than the smoothest paper base material. A poor paper-one that has not been supercalendared will have 5 to 15 db more noise than the best paper. We have exaggerated the effect in fig. 2 so that it can more easily be seen.

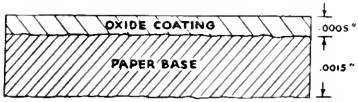


Fig. 2. Showing how microscopic surface irregularity of base can introduce coating thickness variations and hence modulation noise.

The professional user will naturally use a plastic base tape for all critical work, but he will not thereby assure the lowest possible modulation noise. It is possible to have a rather uneven coating top-surface, and, therefore, much noise. Some plastic tape presently marketed has considerable modulation noise in the 40 to 60 cps range due to coating machine imperfection. However, our engineers, with more than ten years experience in the construction and use of disc coating machines, were able to design and build coating equipment that makes the tape free from such low frequency components.

If the recording machine's bias waveform is even slightly assymetrical, the resulting dc component will create modulation noise. Since this will be as steady as the bias current, it will masquerade as ground noise. Most machines on the market suffer from this defect, in varying degree. If there is a 40 to 60 cps component in the modulation noise, it will show up as a hoarsely raspy hum in the background, when run on such a machine.

SOUNDS: (*Continued from Page 2, Col. 1*)

the spot. And when the show opened, the audience never suspected that what they actually heard was the voice of Marc Connelly, crying like a baby — literally, that is.

Up until fairly recently, all of Mr. Valentino's original recordings were made on film before being transferred to Audiodiscs. But, now that high fidelity portable tape recorders are available, many of his original recordings are made on Audiotape, and then re-recorded in permanent form on Audiodiscs.

Readers of this article who would like a copy of Mr. Valentino's latest sound effects catalog can obtain a copy from their local sound equipment dealer, or by writing to Thomas J. Valentino, Inc., 150 West 46th Street, New York 19, N. Y.

NAME YOUR PROBLEM:

From Choosing a Mate, to Raising a Family, You'll Find the Answer on Discs!

Raising a family presents plenty of problems these days, aside from financial ones. Solving many of these growing problems, from the cradle to the altar, is the objective of a series of 24 recordings, entitled "The Family Grows Up" — produced by the Department of Extension Teaching and Information (N. Y. State Colleges of Agriculture and Home Economics, Cornell University), in cooperation with the Department of Child Development and Family Relationships.

This record loan library was started as a means of filling the many requests from Child Study Clubs in the state for help from the college. But the records are also available to other organizations, schools, PTA's, etc., which are interested in using them as a basis for discussion. Topics cover all phases of family life. Each record runs about 10 minutes in length, and when it is sent out to a group, a copy of the script, suggested questions for discussion, references for further reading, and directions for playing the recording are included in the packet.

The programs are under the supervision of Dr. Russell Smart, Associate Professor, Department of Child Development and Family Relationships. Each program consists of an interview between Nita Albers, Radio Editorial Assistant, and either Dr. Smart or Mr. Edward Pope, Assistant Professor in the same department. Some of the records have been dramatized to a certain extent. For example, the first half of several of the programs consists of a skit, and the second half is a discussion of the problems brought out in the skit. It is suggested that the first half be played, then followed by a discussion period by the group, and the last half played as a summary.

The recordings of these programs are made at 78 r.p.m. Rental fee is $1.00; purchase price is $3.50 each. A complete list of the available programs can be obtained by writing to Film Service, Mailing Room, Roberts Hall, Ithaca, N. Y.

Ted Richards, editorial assistant and recording engineer, drops the cutting stylus on a fresh Audiodisc, recording another program for "The Family Grows Up".

Recording of "Columns Write" Makes Double Discussion-Time For Eds

"Columns Write" interviews the daddy of all City Managers Mr. Paul A. Volcker, who has been Township Manager of Teaneck, N. J., for twenty years. Left to right, Mr. August Weisner, editor of The Press Journal of Englewood, Bennett H. Fishler, moderator, editor and publisher of The Sunday Sun and Sun-Bulletin of Teaneck and The Herald-News and Sunday News of Ridgewood, Mr. Edward A. Flynn, managing editor of The Sunday Sun and Sun-Bulletin of Teaneck, and Mr. Paul A. Volcker.

When Radio Station WPAT's (Paterson, N. J.) "Columns Write" goes on the air every Sunday morning at 10:00, its participants are to be found anywhere else but at the station's studios.

Most likely, at that precise moment they will be surrounded by a group of their community's intellectuals, vociferously going over every point with the editor no sooner than he has made it over the air.

This seeming impossibility of a man being in two places at once and engaging in a discussion with two groups simultaneously, is easily explained. Here's how.

"Columns Write" is the oldest panel discussion program on WPAT and probably the oldest newspapermen's program on the air today in continuous broadcasts (five years). Each week, it features from two to four different editors of leading New Jersey newspapers in a discussion of state, national and international problems as viewed through their own editorial policies and opinions of their readers.

Reflecting varied and individual thoughts by men who have no hesitation about voicing them emphatically, the program has always been a lively one — and possesses one of the finest adult listening audiences for its time in the metropolitan area.

But the newspaper editor—a busy individual, and jealous of his Sundays off — began to demur, after the program had been on the air for a couple of years.

He liked the program, the station, the fine job the program was doing, but he definitely did not like this travelling from every part of the state to Paterson on his one sacred day to make the broadcast. What could WPAT do about it?

The answer was simple. Let's record the program on a day and time most convenient to you gentlemen and broadcast it Sundays as usual. The editors said okay; and for the last three years this procedure has been followed.

But, to everybody's satisfaction? Why, no. While the station is eminently satisfied with the arrangement, what's happened to the editors?

Well, the editors still do not have their Sunday's free. Should they not be present where their townspeople can be with them at the time WPAT's "Columns Write" goes on the air to see if their opinions were correctly presented by the editor on the program, and to take exception to any opinion he may give on the show with which they disagree, he hears from them for the rest of the week.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 1 | 444 Madison Avenue, N. Y. C. | January, 1950

THE PROTESTANT RADIO CENTER, INC.

An Example of Cooperation in Inter-denominational Recording and Broadcasting

There recently opened in Decatur, Georgia, a part of greater Atlanta, a unique radio and audio visual production center which is attracting national notice. It is known as the Protestant Radio Center. It is not a radio station, but it has the finest equipped studios for broadcasting, recording, and producing programs for radio and for audio visual aids. It is unique in that it is the only inter-denominationally owned and controlled institution of its kind in America.

The Center is a venture in Protestant cooperation, and the one word which sums up its purpose is just that—*cooperation.*

Cooperation among the denominations. Four years ago four denominations interested in producing religious radio programs formed the Southern Religious Radio Conference. They have produced one or more programs every week ever since January 1, 1946.

Cooperation with the radio stations. The Conference started with 26 stations which accepted the programs on a sustaining basis. There are 97 stations now affiliated with the Conference. This is one of the biggest networks for a sustained religious radio program in the nation today. The stations at present extend from Washington, D. C. to Amarillo, Texas and Gallup, N. M.; from Kearney, Nebraska to Miami, Fla. Most of the fifty thousand watt stations in this territory accept these programs.

Cooperation in production. These denominations, with this large number of stations, felt the need of a production center, jointly owned and controlled by the members. Consequently an application for a non-profit charter was drawn up and filed by the late Allen W. Clapp, one of the outstanding Atlanta attorneys. The charter was granted by the state of Georgia, and the corporation has been recognized by the Federal Government as a tax-exempt corporation, gifts to which

(*Continued on Page 2, Col. 1*)

Disc recorders and control console being installed in Protestant Radio Center's headquarters, at Music Building of Agness Scott College, Decatur, Georgia.

HOW WE USE RECORDINGS IN THE ST. LOUIS SCHOOLS

By Llewelyn Lieber — Director of Audio-Visual Education

"Oh, how I wish my students could have heard that!" is no longer a familiar cry in the St. Louis public schools. For now tape and disc recordings bring treasured auditory experiences right into the classroom. The Division of Audio-Visual Education maintains a recordings library which incorporates all the regular uses of recordings and a few which may be unique. For instance, at an Open House two exchange students from Bangkok were guests. They were escorted into a room and a recorder took down their impressions of education in the United States and their answers to questions concerning the Siamese system. And when the Freedom Train visited St. Louis, it called forth the presentation of two radio programs on the Revolutionary Era. The Division of Audio-Visual Education made recordings of these broadcasts so that they might be used for future history classes; for demonstrations on recorder techniques; and for the personal benefit of the participating students.

The in-service teacher training program has benefited from the synchronizing of Kodachrome slides with magnetic recordings. This device has been used to show student-teachers how a St. Louis teacher in special education, developed a Christmas program — how deaf children are taught in Gallaudet School. These sound-picture projects have been used in talks to parent groups, members of the Board of Education, and to other civic groups.

Radio programs originating from the Division of Audio-Visual Education have

(*Continued on Page 2, Col. 2*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 6, No. 1 JANUARY, 1950

Protestant Radio Center

(*Continued from Page 1, Col. 1*)

may be deducted in estimating federal income tax.

The basis of the corporation was extended to church affiliated educational institutions and inter-church agencies. The charter authorizes radio production, recording, audio-visual aids, laboratory research and teaching.

The founders of the corporation were Emory University, Candler School of Theology, Agnes Scott College, Columbia Theological Seminary, the Southeastern Inter-Council Office, and the radio committees of the Methodists, Presbyterians, Episcopalians and Lutherans (United). Aided by an anonymous grant, the Center starts off with assets of $25,000 cash and equipment.

The Center is installed in the music building of Agnes Scott College, one of the finest of its kind in the land. The equipment is of the latest model. The Center has a portable tape recording unit for remote use. It is equipped to cut recordings for radio use: 16 inch at 33 1/3 rpm. It can also cut phonograph recordings at the conventional 78 rpm and also the long playing microgroove type.

Cooperation on the national level. The Protestant Radio Center is the official regional outlet for the programs of the newly organized national Protestant Radio Commission of New York. In addition to that the Center produces programs for the nation-wide networks. This fall it produced a program for the Mutual net. A program for the Columbia Church of the Air originated here. For four months during the summer of 1950 the NBC National Radio Pulpit will originate at the Center.

Dean H. B. Trimble of the Candler School of Theology is the President. Dr. John M. Alexander, secretary of the Radio Division of the Presbyterian Church US, is the Executive Vice President. Dr. John R. Brokhoff, pastor of the United Lutheran Church of the Redeemer, is secretary, and Mr. George H. Mew, of Emory University, is the Treasurer. Mr. Warde Adams, Jr., is the Production Manager, and Mr. M. F. Adams, Jr., is consulting engineer.

Recordings in St. Louis Schools

(*Continued from Page 1, Col. 3*)

profited from the use of tape and disc recordings, for it is a most effective way to develop new series. For example, Dr. John Whitney, Consultant in Science at Harris Teachers College, inaugurated a new series of programs designed to guide elementary children with scientific experiments in the classroom. Before going on the air, tape recordings were made and taken into classrooms where the teachers and pupils listened critically for flaws in technique. These were corrected and a new recording tried out on other groups until pace, content, and voice quality were satisfactory. Finally, a disc was made and tried out with a regular elementary classroom on their school stage following the recorded directions while an audience of teachers and principals observed the entire procedure from the auditorium. Acceptance was unanimous so the series was put on the air.

All radio programs sponsored by the Division of Audio-Visual Education are recorded on discs, and these are auditioned by a committee of ten St. Louis Public School teachers who make a written evaluation of each program. At the conclusion of the series a tally of the recommendations is made and if the teachers believe the programs merit inclusion in the recording library, dubs are made and placed in service for issue to the schools whenever teachers request them.

To celebrate "Writer's Day," Blewett High School invited Miss Clarisa Start, feature writer for the St. Louis Post-Dispatch, Robert Hereford, author of "Old Man River" and feature writer for the Globe-Democrat, and Mrs. Fannie Cook, author of "Mrs. Palmer's Honey" and other novels, to speak to the student body. The speakers told the techniques employed when writing for a newspaper and when writing a book. Now future English classes can benefit from these authorities for the Division of Audio-Visual Education made a recording of the entire program.

When eighth grade pupils of Cupples School visited Missouri's capital in Jefferson City, the Division of Audio-Visual Education made a recording of their impressions of the trip after they returned. Seventh grade pupils of the same school interrogated the children who had made the excursion and this resulted in a clarification of benefits derived from the trip, a review of facts learned and a permanent record for future reference.

Celebrities visiting the Division of Audio-Visual Education are usually interviewed with a recorder so that a library of talks by outstanding authorities on various subjects is gradually being assembled. This is available for use in public relations work, teacher training, workshop courses and special subject classes, and will be valuable to posterity as a means of *hearing* famous people express themselves.

The Division of Audio-Visual Education follows the routine procedure of using recorders for perfecting speeches to be made by staff members; for correcting errors in children's classwork in English, dramatics and reading; and for recording radio programs for school use which come over the air after school hours or at inconvenient times during school hours. Yes, the schools have really "gone on record" here in St. Louis.

AUDIOSCRIPTS 1949 NOW AVAILABLE

A collection of 16 Prize-Winning Scripts from the AER and Scholastic Magazines' Contests

Audio Devices has prepared, in convenient booklet form, a collection of 16 complete prize-winning radio scripts, selected from the 1949 Scholastic Magazines' Script Writing Contest (for high school students) and AER National Radio Script Contest.

These outstanding scripts are the creative work of the best student writers in the country—many of whom may well be among the ace scripters of tomorrow. Their work will be of great interest to all teachers and students, as well as to anyone concerned with the preparation of scripts for radio or other recording applications. They will, of course, be of particular value to high school and college teachers whose students are entering the 1950 contests. School and home recordists will find this collection very worth-while for still another reason, too. For practically all of these scripts — particularly the original radio dramas—make excellent material for recording in the classroom or at home. This booklet, 8½ by 11 inches in size, is being offered at actual cost, as a service to educators and others interested in script writing. It sells for $2.00 List per copy. Readers of Audio Record, however, can obtain copies at $1.00 each. Send check or money order to Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y. (Dep't S-1).

audio pointers for the Recordist

by C. J. LeBel, Vice President,
Audio Devices, Inc.

REMARKS ON MAGNETICS

C. J. LeBel

With the advent of magnetic recording, many engineers have suddenly developed a new interest in magnetic fundamentals, a subject carefully forgotten since college days. To appease them we will proceed to discuss some basic magnetics, using industry practice in terminology rather than the official AIEE standard. Finally, we will give magnetic data on both red and black AUDIOTAPE.

In Fig. 1 we show a typical relation between the magnetizing force applied to a material and the resulting magnetic induction (magnetization). This curve shows what happens when you start with a completely de-magnetized material, and increase the magnetizing force progressively. Note that the curve levels off at the upper end as saturation is approached (point A). If we now *decrease* the magnetizing force from its peak value A back down to zero, the magnetic induction will fail to retrace the curve previously followed. Instead, it will decrease much more slowly, following the dotted line AB shown in Fig. 2. Even when the magnetizing force has dropped to zero, a certain amount of residual magnetization remains (point B). To remove this, it is necessary to apply a magnetizing force of opposite polarity. The curve will then be as shown by the dotted line BC in Fig. 2. Then, if this negative magnetizing force is progressively increased, the curve will continue along dotted line CD, approaching negative saturation and returning along dotted line DEFA as the magnetizing force is reduced to zero and then increased positively again. This failure of the curve to retrace its original path is called hysteresis, and the dotted curve shown in Fig. 2 is a hysteresis loop, the magnetization curve which results when we increase and decrease the magnetizing force cyclically.

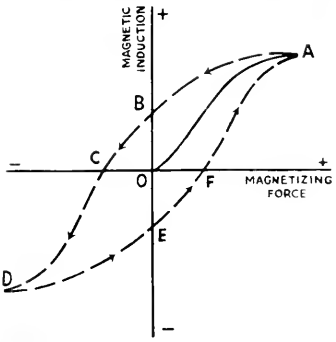


Fig. 2 Development of typical hysteresis loop by cyclically varying magnetic field.

Actually, we have oversimplified the matter in Fig. 2, because we do not ordinarily get back exactly to the starting point (A) the first time around the loop. After thirty or forty cyclic variations the loop retraces itself exactly, and it is this which is ordinarily shown, rather than the first loop traced after the initial magnetization curve (line OA)

In Fig. 3, we show typical hysteresis loops for plastic and paper base AUDIO TAPE. In these illustrations we have, for the first time, introduced units. Magnetizing or magnetic force (usual symbol H) is measured in oersteds, one oersted being the value which would produce a magnetic induction of one flux line per square centimeter in air. Magnetic induction is measured here in maxwells (usual symbol B), the maxwell being a unit indicating the total induction. Another unit of magnetic induction is the gauss, a measure of flux density. One gauss is equivalent to one maxwell per square centimeter.

A great deal of magnetic testing equipment is calibrated in gausses, because it was originally built for testing wire. Since a curve tracer fundamentally reads total induction, the gauss scale is produced by assuming an area of 160 circular mils, a standard wire area. On tape the total coating cross-section will vary, but the customer really buys and uses the total induction, so all of our test data are given in maxwells.

It is easier to classify materials if their characteristics can be summarized in a few numbers, rather than by the infinite number of values given by curves. In the case of magnetic oxides it has become customary to use two index values: the retentivity and the coercive force.

Retentivity is the magnetic induction at which the *magnetizing force is zero,* in a symmetrical cyclically varying magnetic field. It is marked Br in Fig. 3. The other number is coercive force, which is the magnetizing force at which the *magnetic induction is reduced to zero* in a cyclically varying magnetic field. It is marked Hc in Fig. 3. Coercive force and retentivity well define the characteristics of most magnetic materials at 60 cycles, but they are somewhat indefinite as a guide to recording properties, as will be discussed later. As a matter of actual practice, the retentivity is generally determined by application of a 60 cycle field with a peak value of 1,000 oersteds, which is well beyond saturation.

The following are the magnetics of plastic base AUDIOTAPE:

Red:	Hc =	240 — 270 oersteds
	Br =	.5 — .58 maxwell
Black:	Hc =	300 — 340 oersteds
	Br =	.5 — .58 maxwell

Paper base AUDIOTAPE will have the same coercive force. Retentivity will normally be in the same range, but it is subject

(*Continued on Page 4, Col. 2*)

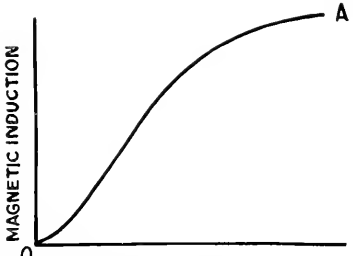


Fig. 1 Magnetizing force and initial magnetic induction for a typical magnetic material.

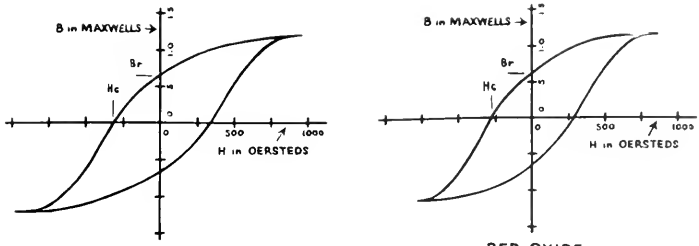


Fig. 3 Hysteresis loops for typical AUDIOTAPES.

TAPE-RECORDED PROGRAM REVEALS FACTS OF LIFE

"It's Your Life" lifts the lid on hitherto taboo subjects, in its continuing battle for better health

Chicago's tape-recorded, award winning documentary radio program, "It's Your Life", has blazed many important trails in the broadcasting field. Noteworthy among these has been the fearless and straightforward manner in which they have tackled the delicate problem of sex education. This subject, which has so long been discussed only in whispers or behind closed doors, was given the full treatment in a unique two-part program which pulled no punches and did not obscure its important message with mincing references to the birds and bees.

The first program featured Chicago children discussing sex education with a prominent physician. Segregated groups of 12 year olds told their problems, described physical changes, and explained their feelings on the subject. And the doctor answered all their questions in an equally frank manner. In recording such a discussion, one may readily appreciate the advantages of using tape—with its easy editing (and easy *censoring*) qualities.

The second program in the series highlighted the lives of two girls—one who suffered tragic consequences as a result of improper sex education, and another who had the benefit of intelligent guidance. The contrast in the lives of these two girls effectively dramatized the importance of sex knowledge in helping adolescents to adjust themselves normally to the physical and mental changes coincident with "growing up".

These two programs achieved a two-fold purpose. One, to give helpful suggestions to parents and point out the value of intelligent sex education in the lives of their children; and two, to instruct the boys and girls themselves who were listening at their radios.

Produced by Ben Park, who has an outstanding record in the Mid West as a producer of award winning documentary radio programs, "It's Your Life" is designed to show how better health means better community living. Since its inception little more than a year ago, the program has won five awards for excellence as the "most outstanding program of the year" and gained nation-wide attention in the health education field.

In collecting material for "It's Your Life", interviewer Don Herbert and his tape recorder visit homes, hospitals, nurseries, welfare agencies—wherever in Chicago people live and fight battles for better health. For the first time in radio history, listeners have been taken behind the scenes of such real-life dramas as the delicate blue baby operation performed in a Chicago hospital; the birth of a baby in a Chicago home; the treatment for such ills as alcoholism, mental illness, tuberculosis and venereal disease.

"It's Your Life" is produced for the Chicago Industrial Health Association—a non-profit agency made up of 39 member agencies for the good of Chicagoans—and sponsored by Johnson & Johnson, makers of surgical dressings. All programs are reviewed by a medical advisory board for authenticity before being presented over the air. These programs are broadcast at 3:30 P.M., Sundays, over Station WMAQ, the NBC outlet

Producer Ben Park (left) and interviewer Don Herbert time "It's Your Life" with a ruler instead of a stop watch. An average half-hour broadcast requires hours, and sometimes days, of actual recording. The completed reels are edited down to comprise the finished program.

Remarks on Magnetics

(*Continued from Page 3, Col. 1*)

to variation over a rather wider range due to variation in paper thickness.

A number of writers have expounded the theory that the high frequency response of a magnetic recording medium correlates directly with its coercive force. This may be termed a cornerstone of the classical theory. Unfortunately, the classical theory is badly oversimplified, and the gap between theory and practice is too wide to be overlooked. The correlation between coercive force and high frequency response exists only when comparing successive batches of nominally identical oxides. It is a fairly satisfactory production control tool, but very dangerous if applied to research results. For example, in comparing a red with a black oxide, it becomes entirely valueless.

Classical theory also indicates that retentivity correlates directly with low frequency response. Again, this is a very oversimplified picture, for the relation works well as a production tool on nominally identical oxides, but fails hopelessly when comparing hundreds of oxides in research. The error may then be as much as 20 or 30 db.

It is possible to derive another magnetic characteristic by producing a series of hysteresis loops with different values for Hm, the maximum magnetizing force. We get a series of values for Hc and Br corresponding to various values of Hm. The more useful relation is the one between Hm and Br, which we have shown in Fig. 4.

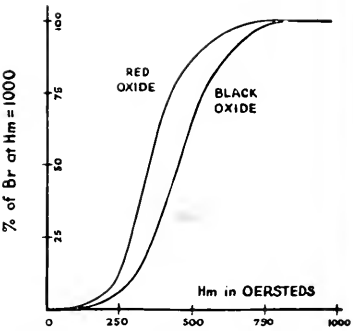


Fig. 4. Relation between retentivity and maximum magnetizing force.

A useful index point which can be derived from this curve is the saturation magnetic force, which is marked on Fig. 4. This is of interest because a tape has to be saturated, at least momentarily, to erase it. The higher the saturation force, the harder to erase. For the particular oxides shown in Fig. 4, the values are 810 oersteds for the black and 710 oersteds for the red.

Seeing that magnetic characteristics are so far from linear, we can only marvel at the effect of AC bias in linearizing the transfer characteristics.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 2 444 Madison Avenue, N. Y. C. February, 1950

NEW STATE-WIDE PROGRAM GIVES MINNESOTA SCHOOLS TAPE RECORDINGS AT ROCK-BOTTOM COST

Mail-Order Tape Service opens vast new field for use of educational recordings

It all began last spring — at the Spring English Conference held at the University of Minnesota. Here, teachers made a strong plea for a lower cost source of recorded material for classroom use. Particular mention was made of the many radio programs on the air which would be of great educational value if they could be brought into the classroom at times when their message or content would be most appropriate.

Since this Conference left no doubt as to the need for good recorded material—at a price within the range of even the smallest schools—the Minnesota Department of Education decided to *do* something about it. So, with the help and cooperation of the University of Minnesota and a private business concern, a radically new system of making and distributing recordings has been established. This program, organized on an experimental basis, is now in full swing—offering a unique, low-cost recording service to all of Minnesota's 7000 schools.

Final details of the program were worked out largely by Richard C. Brower, audio-visual-radio director for the Minnesota Department of Education, and Betty T Girling and other staff members of the University of Minnesota Radio Station KUOM Here's how the program works.

The state education department is building up an extensive library of master tape recordings — covering the complete range of subjects appropriate for classroom use. These recordings are being secured from Station KUOM, from the networks, and through the U. S. Office of Education in Washington, D. C. A catalog of the available recordings, with monthly supplements to keep it up to date, is distributed to all interested schools.

In order to participate, the only investment required by the individual schools is the purchase of suitable tape recorders and reels of recording tape. A teacher desiring

(*Continued on Page 2, Col. 1*)

Mrs. Marjorie Taylor uses new system in District 14 Country School near Zimmerman, Minn.—leading her class in singing, with a recording of top quality chorus of voices. (Photo, courtesy of The Minneapolis Star).

They "speak for themselves"— in these comments on the performance of the free samples we sent out

A Radio Station: "Superior in every way to any tape we have used so far."

A College "Found your tape a very excellent product, and plan to stock it exclusively. Lower hum level most noticeable improvement."

A Vocation School: "Of several brands of tape tried 'Audiotape' has the lowest consistent noise level. Response is exceptionally constant for all parts of each reel."

A Radio Station: "Have tried the plastic tape — find it equal or better than other makes. We are now regularly using it for all tape recording work."

An Industrial Firm: "Thanks for the sample of plastic base Audiotape. I find that it excels all other makes now on the market in quietness, range, and easy handling. Have disposed of all other makes and am using only Audiotape."

A High School: "Have tested the samples of Audiotape and we are much pleased with it. For our machines your red oxide paper is as satisfactory as the plastic tape we had been using. Our school system is now using this red oxide paper tape as an economy measure over the other plastic."

A Church "Your tape is excellent and we will buy it from now on. Also thanks for the 'Audio Record' with articles on tape recording."

A University: "After trying samples of your paper tapes, ordered 20 rolls. I believe they are the best buy in paper tapes now available."

(*Continued on Page 2, Col. 1*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 6, No. 2 FEBRUARY, 1950

Minnesota Schools

(*Continued from Page 1, Col. 1*)

any of the listed subjects simply fills out an order form specifying the programs wanted, the type of machine on which they will be reproduced, and the desired recording speed in feet per second. This form is then sent in to the Department of Education, together with the required number of reels of "blank" tape. The desired selections are then recorded from the master tape onto the "blank" reels, which are promptly returned to the teacher.

The recordings thus made can be used by the school as desired—either played back and then erased, kept on file for future reference, or transcribed onto discs for permanent record. Thus, the actual cost for obtaining these educational recordings is only the required postage and the tape itself.

As a result of this program, the world's outstanding authorities are now doing important teaching jobs in the Minnesota schools — via low-cost, high-fidelity tape recordings.

CLEVELAND JOBBER'S NEW QUARTERS SIMPLIFY PURCHASE OF AUDIO COMPONENTS

The Radio & Electronic Parts Corp., Cleveland, Ohio, has recently moved to a completely new building which has been specially designed throughout to give better "Service to the Customer."

One of the first things that Repco patrons are impressed with is the large parking lot planned for their convenience — a distinct contrast to the Company's previous quarters in the heavily congested, traffic-choked downtown area. And, once inside the building, it is evident that this same spaciousness and convenience has been followed through in every detail of planning. The main salesroom (where you can buy anything from an Audiodisc to an Audiopoint — and a few million other things) has large, roomy aisles, a variety of self-service island displays, and 60 feet of counter space.

Repco's sound department is of particular interest. Located on a mezzanine extending the full length of the building, it is based on the idea that the best way to give the customer exactly what he wants is to demonstrate it in actual operation. Here, the prospective purchaser can see and hear practically any conceivable combination of audio and video components. Antennas, tuners, amplifiers, microphones, speakers and recorders can be quickly hooked up as desired and demonstrated on the spot. The arrangement provides for instantaneous switch-over from one combination to another, giving an accurate comparison of the relative merits of the different components. Take TV antennas for example. There are eight different antenna installations on the roof of the building, and the salesman can show a customer the differences in the various models as a function of the image on the television tube.

L. W. Schwartz, Repco president *(right)* explains his sound-room setup to Al Kahn *(left)*, president of Electro-Voice, Inc., and William J. Doyle *(center)*, sales manager of the Astatic Corp.

Radio and Electronic Parts Corp. has been a distributor of Audio Devices products for the past ten years. They now handle the full line of Audiotape, Audiodiscs and Audiopoints.

Comments on Audiotape

(*Continued from Page 1, Col. 3*)

A Radio Station: "It is the best tape on the market to date — less noise and under a microscope it is the cleanest tape I have seen. It is the tape we will use here you can be sure of that."

A Broadcasting School: "Thank you for the Audiotape samples. They are the best we have tried to date. Same high quality as your Audiodiscs. Will order more locally."

A College: "The plastic base tape I requested was completely satisfactory. There was a distinct reduction in amplitude modulation of high frequencies over a similar competitive tape."

A Film and Sound Service: "Received sample tape; our findings show after being put through the 'acid test' that Audiotape is far superior to anything we have used yet and we have pretty well covered the field. Prefer the black oxide for excellent bass frequency response."

A High School: "Excellent — I use recordings in my English classes and find your tape of unusual fidelity."

A Radio Station: "Like your plastic tape. It does a *much* better job than any other tape that we've used. Audiotape gets our bid!"

A Sound Studio: "It was immediately apparent after initial comparisons that paper Audiotape is of a far superior quality. Have been using it exclusively where a paper base tape was indicated. Reels are not subject to scraping or damaging of tape as often the case with other brands."

A Radio Station: "Very well satisfied with your tape, particularly the plastic. Have the assurance of our chief engineer that we will be in a position to use your plastic tape exclusively when our tape recording operations get into full swing. Our tests indicate that plastic Audiotape is superior in every way to any other."

A College: "We are using your plastic base Audiotape exclusively for the original recording of our radio programs. We find that there is practically no loss from dubbing from tape to disc."

A Radio-Ham: "Have used the plastic base tape with surprisingly excellent results. Recordings made of organ music on Audiotape were transferred to discs with no discernible loss of fidelity. Your product is what the trade calls 'a fine article', and in the words of one radio-ham friend who sees a good thing, 'I'll buy some of that!' Thanks again."

A Research Lab: "Have found your recording tape to be the best for my recorder. Very low noise level and very uniform characteristics are its outstanding qualities. The price is also attractive."

A Radio Station: "We have found that the samples of Audiotape meet all the claims you have made for it. We are using some of your plastic tape, which we purchased on the strength of your name and advertisements alone, and have found this tape superior to any we have ever used at this station."

To date we have received many hundreds of these cards commenting favorably and enthusiastically on the performance of Audiotape. The remarks quoted above are typical. We wish to thank all of these users for the overwhelming vote of confidence.

audio pointers for the Recordist

by C. J. LeBel, Vice President,
Audio Devices, Inc.

MORE ON MODULATION NOISE

C. J. LeBel

Tape machine noise is a highly variable factor — it seems to increase under these many changes in condition: from the factory test floor to the recording room, during recording room use, and from one make of machine to another. Since these increases range from 5 to 25 db, they are not to be ignored.

Some increases reflect changing amounts of hum, but much results from an increase in tape hiss. We propose to examine the reasons why a given tape may be so much quieter on one machine than on another; or so much quieter in one recording room than in another, on the same type machine.

Most of the increases referred to result from a change in the *character* of the effective bias on the tape. Particularly, we believe that they reflect an increase of modulation noise[1] caused by a dc component of bias flux; or by its equivalent, assymetrical distortion of the bias flux. An actual dc component can originate in dc leakage through one of the head coils, or in permanent magnetization of the core of a head; assymetrical distortion arises in the bias oscillator or its amplifier, particularly when not push pull.

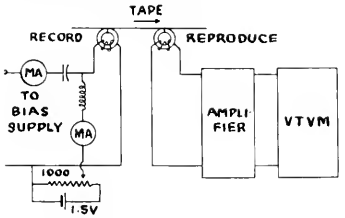


FIG. 1 — Test Circuit for measuring the effect of dc bias component on noise.

In order to determine the effect of dc leakage, we set up the circuit of figure 1. An adjustable amount of dc could be passed through the recording head simultaneously with any desired value of bias, and the currents could be measured separately.

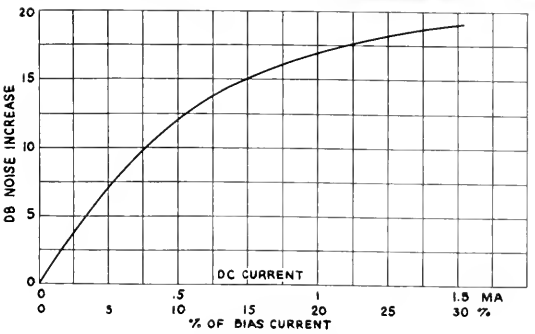


FIG. 2 — Effect of dc component on tape noise.

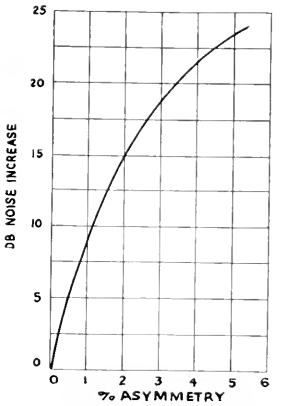


FIG. 3—Effect of bias assymetry on noise, after Gratian.

The bias used was 5 ma at 74 kc, which was a representative bias for this type of head.[2] The tape used was our red oxide on plastic base. Results are shown in figure 2.

If we study this figure we note that noise increases 5db with the passage of only .2 milliampere, which with a 300 volt dc supply would correspond to a leakage resistance of 1.5 megohms. Since a number of home units have used a blocking condenser whose insulation resistance could easily fall to 1.5 megohms after a spell of humid weather, it appears that some attention to leakage conditions might be in order.

We felt that it would be interesting to compare our dc results with J. W. Gratian's work on erase assymetry,[3] so have changed his data to a db basis and replotted it in figure 3. He states that his results are applicable to bias fault as well as to erase. Both curves seem to have essentially the same shape, but Gratian's work seems to reflect much greater sensitivity. We are not sure whether this stems from the greater effect of assymetry, or whether the use of an entirely different oxide is the cause.

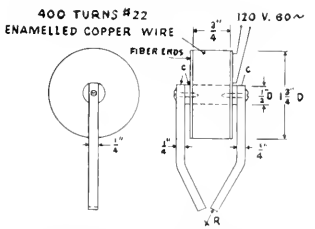
In any case, we agree with Gratian's observation that bias assymetry may be neutralized in effect by the addition of proper amount of dc of correct polarity. Perhaps some broadcasters using home machines for remote pickups might use this idea to improve their signal to noise ratio.

While noise may be created by poor erase waveform as Gratian shows, we find that much of this noise is erased by the bias flux.

Another source of noise is permanent magnetization of the recording head as a result of transients in the signal. A machine may start the day with a signal to noise ratio of 61 db. and be down to 54 db by night, due to this effect. Hence, professional machine manufacturers recommend frequent demagnetization of the recording head. Usually they can supply equipment for doing this, and some machines have built-in demagnetization means. If you cannot secure a demagnetizer from the manufacturer, you may wish to have one built, like figure 4. Most of the dimensions are not critical, but the radius on the tips of the poles must be a good fit to the curvature of the recording head. The coil may be either random wound, or layer wound with .0015" glassine between layers.

To use, plug into 115 volt AC, and apply pole tips to recording head. Slide sideways and gradually remove from the head. Do not connect to the power line for over 10 seconds at a time, for the coil overheats with great rapidity.

(*Continued on Page 4, Col. 1*)



R: MAKE RADIUS TO FIT RECORDING HEAD
C: MAKE OF SILICON STEEL "RELAY BAR", OR SOFT IRON

FIG. 4 — Head demagnetizer.

Unique Centralized Recording Studio Serves U. of I. School of Music

Wolfgang Kuhn, Assistant Professor of Music, turns out transcriptions on Audiodiscs in the new recording room of the University of Illinois School of Music.

Located high at the back of a large recital hall, in a remodeled projection room, is one of the most compact — and one of the busiest recording rooms in this country. It's the new, centralized recording installation of the University of Illinois School of Music.

Here, transcriptions are made from the stage of the Recital Hall — or from any class room or rehearsal room in the entire school. And facilities permit instant playback of any recording to whatever room it originated from. In addition, recorded music as well as live radio programs can be channeled directly from "headquarters" to any of the class rooms, as an aid in teaching and learning the performance of music.

This installation also serves as a remote control room for the University Radio Service, WILL, which carries weekly programs performed by the faculty and the students, and by the various choral and instrumental organizations of the School of Music.

The University of Illinois School of Music is collecting a permanent file of past programs for reference, class-room use and future broadcast. Works already on file comprise one of the largest and most representative collections of contemporary music — as performed, during the annual Contemporary Arts Festival, by the U. of I. Sinfonetta and Orchestra, conducted by John M. Kuypers, director of the School of Music, the Walden String Quartet, and other ensembles, choral groups and famous guest artists.

The recording studio was installed last March, and has been under the able direction of Wolfgang Kuhn, Assistant Professor of Music. Since then, the demands for service from this department have increased so rapidly that now, besides Mr. Kuhn, two engineers spend most of their time at the controls.

MODULATION NOISE

(*Continued from Page 3, Col. 3*)

Recording heads should be demagnetized at least once a day for good results, and twice a day if the best signal to noise ratio is desired.

REFERENCES

1. *C. J. LeBel, Modulation Noise, Audio Record, December 1949.*
2. *C. J. LeBel, New Method of Measuring Bias, Audio Record, June July, 1949.*
3. *J. W. Gratian, Noise in Magnetic Recording Systems as Influenced by the Characteristics of Bias and Erase Signals, JL Acoust. Soc. Amer. vol. 21, no. 2, pp 74-81, March 1949.*

HAVE YOU READ THESE PRIZE-WINNING SCRIPTS YET?

Audioscripts 1949 is a collection of 16 complete radio scripts — written by high school and college students and selected from prize-winning entries in the 1949 Scholastic Magazines and AER contests. These scripts are essential reading for all budding script writers, and their teachers. Moreover, they make excellent material for dramatizing and recording in the classroom or at home. All sound cues and sound effects instructions are included. The contents are listed below:

SCHOLASTIC MAGAZINES' RADIO SCRIPT WRITING CONTEST

(High School Students)

Original Radio Drama

First Prize—SOMETIME TOMORROW, By Richard Jackson, Jr.

Second Prize—THE DREAM, By Neil Jackson.

Third Prize—THE JANITOR'S TALE, By Juanita Pennell.

Fourth Prizes—THE LAYING PLACE, By Richard McMahon.

ALONE, By Louis Freizer.

CHUBBY THE CARROT, By Marian E. Tyrrell.

PIER 51, By Winthrop Griffith.

General Radio Scripts

First Prize—AN IMAGINARY INTERVIEW WITH GEORGE BERNARD SHAW, By Elena Joan Svagzdys.

Second Prize—HIGH SCHOOL PSYCHOLOGY, By Mary Carol Massi.

Third Prize—THE STORY BEHIND THE LABEL, By Richard Wallace.

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Fourth Prize—A PRUDENT WOMAN. Adapted from the Bible, by Mary Catherine Franklin.

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(College Students)

Classification No. 5 — Scripts for Home and School Recording

First Prize — HOW THE ROCKING CHAIR GOT ITS SQUEAK, By Fred A. Brewer.

Second Prize — RENDEZVOUS, By Herbert Rube.

Third Prize — VALLUM HADRIANI, By Carl C. Naumann.

This collection is offered at cost — $1.00 net each. Send check or money order to Audio Devices, Inc., 444 Madison Ave., New York 44, N. Y.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 3 444 Madison Avenue, N. Y. C. March 1950

INSIDE WFAA

— The story of a modern high-fidelity recording room

By M. W. Jeffers
WFAA Recording,
Dallas, Texas

In 1946, Station WFAA, Dallas, decided to improve their recording room set-up — to provide the Southwest with the last word in modern high fidelity sound recording facilities. Plans were drawn and redrawn — ideas exchanged — innumerable conferences held. Here is the cumulative result of more than two years of planning and construction — a room 19′ by 13′, filled to capacity with the most modern recording equipment, including 6 racks, 4 recording machines, 2 dubbing and playback tables and record-storage space.

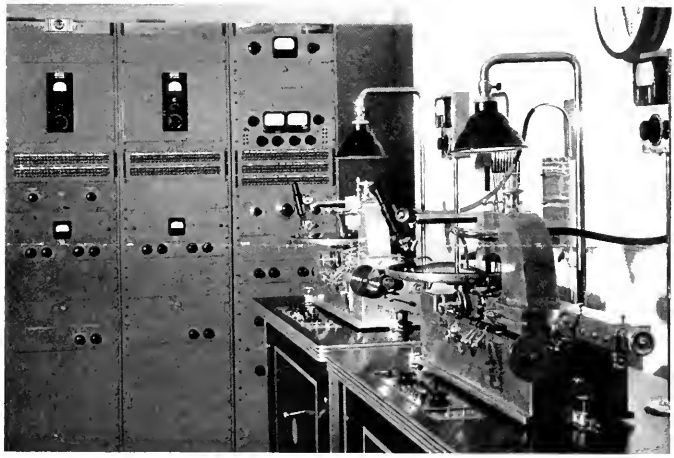

Fig. 1 — General view of WFAA's recording room, showing three of the racks and two of the disc recorders.

While the equipment is fairly conventional in itself, the finished layout is of particular interest from the standpoint of appearance, performance and operational features.

The entire system was designed for high quality and high fidelity from beginning to end. Each piece of equipment was thoroughly inspected and tested. Distortion, frequency response, gain, etc., were measured before installation, resulting in overall performance that leaves little to be desired.

Fig. 1 shows a partial view of the equipment from the entrance — including three of the six racks and two of the four disc recorders. The other two recorders are on the opposite side of the room, and the dubbing and playback tables (shown in Fig. 2)

(Continued on Page 2, Col. 1)

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Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 6, No. 3 MARCH, 1950

Inside WFAA

(*Continued from Page 1, Col. 3*)

are located at the left, adjacent to the entrance. A combination record storage and desk is located at the right of the entrance. The racks are installed over "wells" across the rear of the room, with three feet of space between wall and racks to allow ample room for maintenance work.

The recording room receives its programs from poly-cylindrical studios via a 12-feed, 6-channel master control room.

Fig. 2 — Dubbing and playback tables, mounted on special rubber cups and cork sheeting to eliminate building vibration.

Four program circuits are normalled to the selective switch system located on each recording table. One other program and two phone circuits are available to be patched at will.

Since all recording channels are identical, only one will be described in detail. Across each input is a pre-set master-relay-operated switch system. This feeds a 50,000 ohm-to-line bridging coil — then to the limiting amplifier (only 3 db or less of compression is used). The high bridging-coil impedance is used so that all four recording channels can be placed across one 500-ohm program source without any impedance upsets. The limiter feeds a volume control with a V U meter across the output, located on the recording table for convenience. Next, a relay operated by a cutter switch, also on the control panel, allows program tone to be interrupted to each individual head without affecting any other, should more than one channel be across a single source. The NAB recording filter and head equalizers follow, and feed the 40-watt Altec recording amplifier which feeds the temperature-controlled RCA MI-11850C recording head.

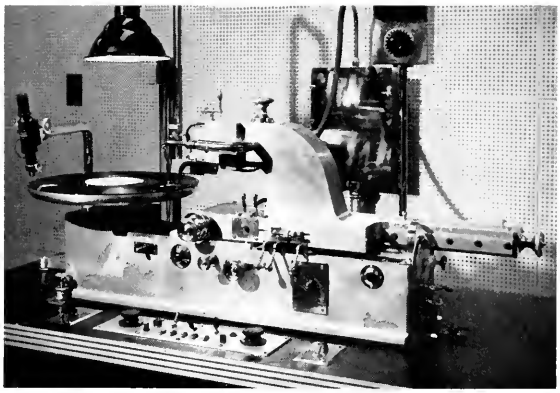


Fig. 3 — One of the four Scully disc recorders, with chip collector in background, and V U meter and attenuator on post at right.

A monitor amplifier and speaker are connected across each recording head, to permit checking circuit continuity, noise, distortion, etc., at the last possible point before it goes on the disc. The frequency response of this amplifier has been modified to complement the recording pre-emphasis. NAB recording standards are used and closely maintained.

Racks 2, 3, 4, and 5 are all identical — like the two left-hand racks shown in Fig. 1. Equipment consists of (top to bottom): recording amplifier, jack strips, band-pass filter, limiting amplifier, bridging coil, recording equalizer, monitor amplifier and relays. Rack 6, at right in Fig. 1, contains (top to bottom) meter for tube checks, utility circuit, pre-amplifiers, transmission measuring set, jack strips, audio oscillator, program amplifiers and power supply for preamps and roving monitor amplifier. This amplifier, together with a 15″ Altec 604 high-fidelity speaker, can be switched across any program circuit in the recording room.

Fig. 3 shows a close-up of one of the four Scully recording machines. On table at front (left to right) are the motor start switch, control panel and recording-head heater switch and pilot light. On the post behind the carriage is the channel V U meter and attenuator. The large box on the wall behind the machine houses a metal sack made of #80 mesh brass hardware cloth, to catch the removed cutting thread. Each machine has its own separate thread collector.

A Spencer central suction plant housed in another part of the building furnishes suction for all four machines. A valve located beneath each thread collector controls the suction at the individual machine.

The dubbing channel equipment illustrated in Fig. 2, is interesting in that the turntables are mounted on Neoprene rubber cups set on a 6″ platform mounted on 1″ cork. This is done to eliminate building vibration. The entire assembly is so constructed that the turntables are waist high, for convenience in operating from a standing position. The dubbing channel circuit,

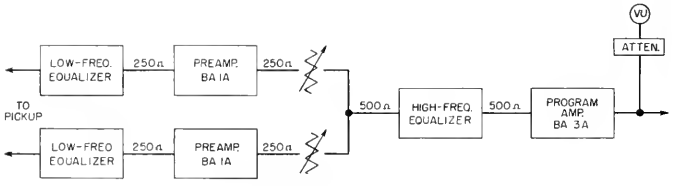


Fig. 4 — Schematic diagram of dubbing channel circuit.

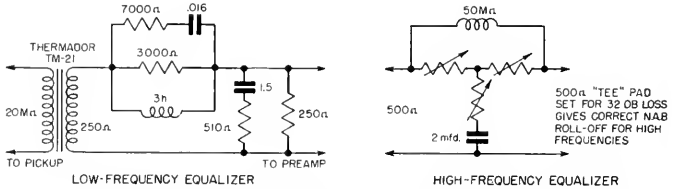


Fig. 5 — Equalizer circuit, with low-frequency portion at left and high-frequency portion at right.

shown in Fig. 4, consists of two pre-amplifiers feeding a two-position mixer and a high-pass filter to further eliminate any possible effect of building vibration on the discs being dubbed. The program amplifier supplies the same signal (+ 8 V U) output as the master control, allowing any or all recording channels to be bridged across it. The heads were selected after exhaustive tests on all leading high-quality pickups on the market. These heads, with a modified arm and an equalizer of our own design, provide reproduction of the NAB recordings within ± 1 db from 30 to 10,000 cycles. The excellent low-frequency response of the pickups led to the extreme steps necessary to eliminate the effects of building vibration.

Amazing even to us, was the fact that the pick-up that gave the best results was a relatively low-priced, high-impedance unit.

However, after equalizing and matching to low-impedance, the output was still within limits as to output (– 63 db).

The equalizer circuit, shown in Fig. 5, excels anything tried, which included every one we had ever seen or heard of — even equalized amplifiers.

After installation was complete and circuit continuity was established, frequency and distortion runs (with pre-emphasis) were made on the complete channels. The overall response is ±2 db, 30-16,000 cycles; and ±1 db, 20-20,000 cycles, without the limiting amplifier. The distortion is less than ½ of 1% over the frequency range. Next, the heads were connected and exhaustive runs were made by actually cutting the frequency runs and checking the resulting cuts by the light pattern method. Equalizers were installed and adjusted until less than ±1 db variation resulted between 800 and 10,000 cycles. The pre-emphasis equalizers were then inserted and frequency runs repeated until the recorded results were well within NAB limits. A frequency run from a resistance capacity oscillator through the recording channel, played back through the dubbing channel and measured on a distortion meter showed a maximum of 1% distortion for all the equipment involved.

Periodic frequency runs and distortion measurements are made, and each needle and disc is noise tested by actually playing and measuring the test cuts on the dubbing channel.

A routine check of the overall system noise level revealed the following: After recording continuously for 9 hours on each of the four recorders, one was picked at random and the playback noise from a test cut, as measured on a G. R. Noise Meter, showed a –50 *db* noise under normal program level of 6 c.m. stylus velocity. Needles used were Audio's Microgroove No. SM 14, and the disc, of course, was a Red Label Audiodisc.

by C. J. LeBel, Vice President,
Audio Devices, Inc.

TAPE BASE MATERIAL

C. J. LeBel

As every experienced engineer has found, it is not possible to make a product which is the ultimate in every single respect, because many properties are achieved only at the expense of others. In short, a good design is one in which conflicts have been resolved to yield the best *overall* performance. The cellulose acetate we use for a tape base material is no exception to this rule.

It will be recalled that two years ago we discarded vinyl copolymer base, and adopted cellulose acetate, because the desirable properties of the vinyl were attained at the expense of too many faults. Cellulose acetate seemed to have a better balance of characteristics, and time has verified this judgment.

There are a number of grades of cellulose acetate, differing in the degree of plasticizing. The minimum amount of plasticizer produces a hard, brittle material. Increased amounts increase the flexibilty, until finally a very soft, rubbery characteristic is produced.

In choosing our base material it was necessary to conform to NAB standards, and this indirectly fixed the thickness of the base at .0015 inches. Adequate strength had to be provided, in this thickness. Normal recording machine tension would have to produce as little permanent stretch as possible, otherwise the program would take longer to reproduce than it should. At the same time, the material would have to withstand the shock of rapid machine reversal, so that impact strength was also necessary.

These stringent requirements ruled out the heavily plasticized acetate, leaving only the light and medium plasticizing to be compared. Recording-wise, the medium grade was preferable, for its improved flexibility allowed the tape to maintain better contact with the head, a guaranty of better high frequency response and smoother motion through the machine. The question was, would the strength prove adequate?

Upon measuring the permanent stretch with various loads, we were surprised to get the result shown in figure 1. Both minimum and medium degrees of plasticizing produce the same permanent stretch at all loads up to 2.5 lbs., and the curves diverge only above that value. At higher loads the greater resilience of the medium plasticizing allows more stretch. We can better evaluate these results if we recall that normal recorder tape tension is of the order of ¼ to ⅝ lbs. The peak tension during reversal, machine manufacturers tell us, is never over 1¼ lbs. In the normal working range, then, the two acetates stretch identically. At heavy peak loads the medium material can give resiliently, where the light would prove too brittle.

Since the breaking strength for both materials was in the 4½ to 5 lb. range, we standardized on the medium plasticizer content.

It is interesting to note that the breaking strength of tape is seven to twenty times the normal working stress. This is a factor of safety worthy of the bridge builder, and certainly very conservative.

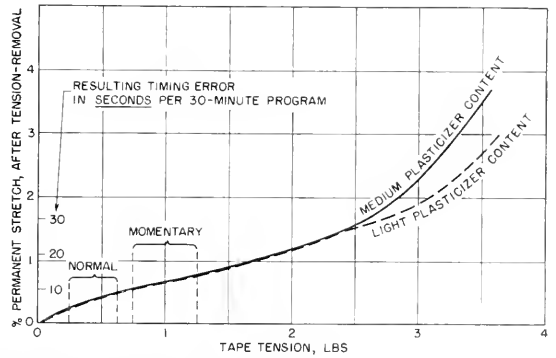


FIG. 1 — Relation between tape tension and permanent stretch after tension is removed. Note extra scale showing corresponding timing error if continued for 30 minutes.

Audiotape Now Available in 2500-foot Rolls

(*Continued from Page* 1, *Col.* 3)

2. The full measure of 2500 feet gives *4% more tape* than the usual 2400-foot reel.

3. There are absolutely no splices in the entire 2500-foot roll. It's guaranteed to be *all one piece.*

4. Audio Devices also *guarantees* that volume deviation within a 2500-foot reel, at 1,000 cps, is not more than $\pm 1/4$ db — and not more than $\pm 1/2$ db from reel to reel. These are *outside limits* — not averages!

5. A unique, specially-designed package (patent pending) makes handling and storage of the tape much easier and safer than ever before — especially when used or stored on the hub alone.

The new Audiotape package is illustrated in detail in Figures A, B, and C. The outside section of the container is made of stiff, durable cardboard, while the folded-over inner section which holds the tape is of rigid corrugated board to provide extra stiffness for easy handling. One side of the inner section has a wide slot, as shown in Fig. B, while the other side, shown raised up in Fig. C, contains a wooden core which fits snugly into the aluminum hub. To transfer a roll of tape on the hub from the box to the horizontal turntable of a professional recorder, it is only necessary to hold the inner container and tape in the position shown in Fig. C — place it over the turntable hub, and then slide the container out from under the tape. In this way the tape itself is firmly supported at all times, and there is no danger of its slipping from the hub or becoming unwound. After use, the roll of tape on the hub can be easily returned to the container by reversing the above operation. Simply slip the slotted side of the container under the tape, then fold over the other side until the wooden core engages with the hub, and it's all ready to pick up and slide back into the box.

Conversion from hub to reel is also greatly facilitated by this unique container. Side flanges can be screwed onto the hub while it is still in the container, as shown in Fig. D and E. With the slotted portion down, simply place the flange over the hub and drop the bottom halves of the three sleeve screws into place as in Fig. D. Then fold the solid portion of the container down onto the reel. This will hold the sleeve screws in place and the container can be turned over so that the flange is on the bottom of the roll. Then lift up the slotted portion, place the top flange over the hub, and insert the other halves of the sleeve screws, as in Fig. E. There's no danger of dropping the screws, or letting the tape slip from the hub. The side flanges from a complete reel can also be easily removed from the hub while the tape is still in the container.

When the tape is stored on the hub in the container, it hangs from the fixed hub-core so that the tape does not rest on itself. Thus, there is no danger of flattening the bottom of the roll or damaging the edges of the tape. And since reel flanges can be attached to the hub so quickly and easily, it saves the expense of storing tape on the reel, even when complete reels are required for use on a particular machine.

The new Type 2551 Audiotape is packed 5 boxes to a carton, and is now available through local Audiotape and Audiodisc suppliers all over the country.

FIG. A. — Audiotape box for 2500-foot roll, showing inner section, with tape on hub, withdrawn from container.

FIG. B. — Inner section of Audiotape box, with slotted portion raised, showing 2500-foot roll on hub, engaged with wooden hub-core on bottom portion.

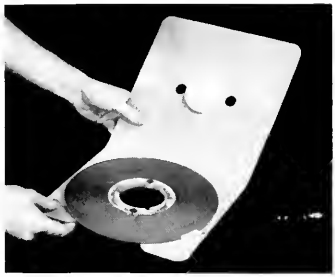


FIG. C.—Inner section of box turned over, with roll of Audiotape on hub resting over slotted portion — in position for placing tape on horizontal turntable of recorder.

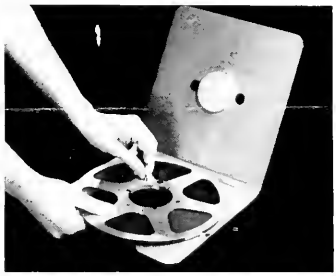


FIG. D. — Inner section of box in same position as Fig. C, showing one reel flange in place and sleeve screws being inserted.

FIG. E. — Inner section of box turned over, with the other reel flange being screwed in place.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 4 | 444 Madison Avenue, N. Y. C. | April 1950

"PORTRAITS IN SOUND"

A New Idea in Tape Recording That Has Been Made Into a Flourishing Business

Veteran recordist, C. Art Foy gets all set to record a church weddi[illegible] — unknown to the bride and groom. The microphone is skillfully concealed in a basket of flowers, as shown by the arrow in the insert above.

A little more than two generations ago a bride posed rigidly with her new husband to the tune of "Hold it — Hold it" while a camera took endless minutes to record her new state for posterity.

Today there is a new wrinkle in such portrait taking. A young army veteran has set up shop under the name of Magnetic Recording Company and is making a lively business of taking what he calls "Portraits in Sound".

No fly by night, Art Foy, who spent nearly four years as a technical adviser in the Army Airways Communications System, is fast becoming a respected young businessman in his community.

His friends call him a recording demon. No matter what he has to work on and no matter how adverse the circumstances — which usually refers to acoustics—he manages to iron out the difficulties and come

(Continued on Page 2, Col. 1)

Music Goes Round the World

— Via International Music Program of American Junior Red Cross

The use of recordings to promote international friendship has found a new vehicle in the American Junior Red Cross International Music Program. Five hundred albums of American school music have been sent to Red Cross societies in fourteen foreign countries to be played in schools. The object of the program is to let children in other countries hear for themselves the songs American children love to sing and play, providing another bond of interest and affection among world youth.

Each album contains six records of school orchestras, bands, choruses, and instrumental ensembles from all over the United States. The twelve selections were chosen from 174 recordings which were submitted for consideration from 51 school music groups. Some of the original recordings were made on tape, but most of them were

(Continued on Page 4, Col. 2)

Swing Choir at Hillsboro, Oregon recording "Comin' Thru The Rye" for Jr. Red Cross Record Album.

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 6, No. 4 APRIL, 1950

Portraits of Sound

(*Continued from Page* 1, *Col.* 3)

through with a high class professional recording. Like the time he boarded the New Columbian of the B & O Railroad and recorded its initial run along with the complete ceremony, or recording in a huge cathedral where echoes are everywhere. Thus the phrase of "Magnetically Recorded by Foy" has come to be used.

Although unmarried, he seems to be particularly fond of recording weddings, and he likes best to take his wedding "Portraits in Sound" when the couple is unaware that they are being recorded. "I always get a kick out of their exclamations of surprise when they find out that Mom and Dad had the foresight to have the whole thing recorded. They always want to know where on earth I had the microphones!"

Art and his staff take pride in the places they manage to conceal their microphones. "We choose our spots well, and sometimes we are like a bunch of kids hiding Easter eggs." Art has been using egg-size microphones but now that he has found one the size of six dimes stacked up, he is in recorder's seventh heaven.

Whether he is recording a wedding, a college concert, a speech or an operetta, he makes it a point to be on hand an hour or so before the event and have his equipment completely set up and out of sight with his tiny microphones hidden in plants, chandeliers, behind vases or what have you, and even though the performers know he is on the spot, they are completely unaware of his presence. One chance remark overheard while leaving a church following a wedding still has Art patting his back. One lady said to another "I couldn't hear the bride and groom at all", with the reply of "Oh, well, we'll hear them when we hear the recording".

Art, who fell in love with radios at the age of eight and was operating his own hand-made ham station fully equipped with an FCC radio license at the age of fourteen, and was one of the first amateur radio operators on the air in the U. S. occupied zone of Germany, now has his own radio shows over Evanston's AM and FM stations. On WEAW, called "On-the-Spot", many of his recordings are aired and also on WNMP called "Your Church Choir" plus special feature shows where on the spot recording is necessary. He also works with WOAK (FM) in Oak ark and has weekly transcriptions aired on WCFL in Chicago.

The "Magnetic Recording Company" goes any where — any time. Here, Mr. Foy sets up his equipment outdoors, to record a football game.

Art likes to point out that his business is possible only because of the great advancements that have been made in the high-fidelity recording field. "Just think", he says, "Out in Des Moines right now a radio station may be playing a record of a church choir that was tape recorded in a Columbus, Ohio church and then sent to me to be made into a disc recording. That sort of thing makes a guy in the recording business feel that he is well, you might say," he finished ruefully, "helping to knit the people of the United States closer together." Sitting in his place of business at 1465 Sherman Avenue, Art surprisingly declared, "My studio is portable." He explained that instead of having people such as singers, speakers, musical instrumentalists, or choral groups, come to him to make their records, he preferred to go to them on their home ground where they can feel perfectly natural and at ease. As he facetiously pointed out, "You know if it's their piano that shows up with an out of tune note on the recording, they can't blame me." His customers are particularly pleased to find out that tape recordings can be played back right away; the sour spots found and erased. Thus, they may repeat their performance over and over until they are completely satisfied and then have the final approved recording transferred to a 10 inch or 12 inch record to be preserved.

When Art recorded the almost two hour long Sonja Henie Ice Show he learned a new trick. Any show he records for later airing he edits very carefully, selecting the highlights and cutting out mistakes to make a jam-packed thirty minute show. He found that to splice tape is wasteful since it can be erased and re-used; so he hit on the idea of working the Sonja Henie show by recording the parts desired on another tape — the result, no tape wasted.

Art and his recording equipment are a familiar sight at school and college musical and dramatic productions. But he gets the biggest thrill from recording younger children in their recitals and activities. They are tremendously interested in his equipment to begin with and then, as he says, there is no greater fun than standing back and observing their expressions when they hear how they sound on record. Art explained, It's this way — "Here is Little Janie who plays the violin and at home she really doesn't sound so very good, but mom keeps her practicing. Yet, when she gets to school with all the others in the band or orchestra they begin to sound really good. Well, when Janie takes home a professional record of her playing she has a definite pride of accomplishment and the record has invoked in Mom and Dad at home an interest far deeper than before. Janie practices harder, too. That sort of thing makes me feel like I'm helping build our community in a small way. Guess I just like children anyway," he said. Mothers who have discovered that their wax recordings of Junior's lispings to Santa or the Easter Bunny made by department stores can be put on a permanent 10 inch record are losing no time in bringing their cardboard discs to Art.

Tight spots are no novelty to Art. At one large concert, he could not find a place for an overhead microphone which was needed to pick up the orchestra and choir. Not at all stumped he quickly canvassed the neighborhood and found a house wife who was willing to lend him her much beknotted clothesline. He hurried back to the church and before the guests arrived he had the clothesline nestled cable-fashion among the rafters out of sight with two microphones pinned on it. We learn as we go along, he said, and now a clothesline is a permanent part of his equipment.

Art laughingly recalls one of the first weddings he worked on. He recorded the ceremony and submitted the tape recording for approval before making the twelve inch discs. "I knew this was one time I had wasted a lot of effort; no one would buy a recording as full of extracurricular noises as this one. Imagine my surprise! They smiled at the airplane roaring into the middle of the prayer; they chuckled when the dog barked as the soloist sang, and they laughed outright when the fire engine broke into their vows, as it clanged by the church windows." They wanted the recordings just as they were. He has found that such noises practically sell the recording. One young bride laughed and laughed when she identified the clunking sound, as her father stumbling against the pew as he stepped back to his place after giving her away.

The son of a Methodist minister, Art has no trouble finding his way about in churches. Ministers and Priests often chat with him. They all seem to like the idea of couples having the opportunity to hear their vows at leisure and without the strain of the wedding day. As one minister said, "There might be a much less chance of couples separating if they had the recording of their vows to listen to at times of marital strife."

Art recorded his first wedding in 1935 as a stunt to surprise the bride and groom. The married couple's pleasure gave him an idea as to just how successful recording weddings could be. And today he is certainly proving it. "After all," he says, "recordings aren't any more expensive than a set of wedding pictures and listening to yourself is just as much fun as looking at yourself."

Improved Lacquer Formulation Gives Audiodiscs Lowest Surface Noise at all Diameters

The problem of surface noise has long been a "headache" to professional as well as amateur recordists — particularly the progressive increase in noise as the cut approaches the center of the disc.

Audio Devices' chief chemist, George M. Sutheim, has now found a practical solution to this problem — by perfecting an improved lacquer formulation that gives lowest surface noise at all diameters. And the variation in noise level is only about 2 db from 5" to 11" recording diameters. Other discs normally have a variation of about 10 db between these same limits.

This important development, now in full production on all Audiodiscs, will be discussed in detail in the next issue of Audio Record.

by C. J. LeBel, Vice President, Audio Devices, Inc.

SOME REMARKS ON EDUCATIONAL RECORDING

C. J. LeBel

Our subject for this month is somewhat of a departure from the usual technical aspects of recording. It is a very important one, however, and we believe it will be of interest not only to educational recordists, but also to others who are concerned with the problem of making good recordings under unfavorable conditions.

The writer recently had an opportunity to speak to a group of high school teachers; this was followed by a short research project with Prof. William J. Temple of Brooklyn College, reported on at the recent Eastern Public Speaking Conference. The contrast between these two activities was so great that an article seemed desirable.

After watching the high school teacher at work, looking over his equipment, and hearing the acoustical performance of his studio (the classroom), only one conclusion is possible: he is trying to do a man's job with, almost literally, boys' tools.

The work with Prof. Temple indicated that a recorder which is to be useful in all speech applications must have surprisingly wide frequency range. In general, an educational recorder is not used to show the well trained teacher the student's faults! It must reproduce the student's mistakes of diction, etc., clearly enough so that the *student himself* can hear them clearly. The outcome is a need for uniform response to at least 7.5 kc. This is one aspect of the faithful vs. pleasing reproduction debate that has gone on for years. Very clearly, the teacher needs photographic realism, complete faithfulness, in his recording system.

Such a degree of faithfulness cannot be achieved by using an ordinary home recorder bought from the most persuasive salesman — it calls for a professional machine and professional accessories.

The average classroom is so reverberant that its use for recording can be condoned only by custom. If you have such a room, heavy (fireproofed) drapes, spaced several inches from the wall, can reduce the fault if not eliminate it. The only fundamental solution is to have an acoustical contractor treat the room.

If the classroom is too reverberant, it is almost mandatory to use a unidirectional microphone of the cardioid or super cardioid type. This will at least minimize the pickup of reverberation. To use the ordinary inexpensive omnidirectional microphone often supplied with the recorder is merely to compound the original acoustical error. If the microphone has a high impedance output, it can even be used to feed the most inexpensive home recorder directly. If the microphone has only a low impedance output, matching transformers are obtainable that can be fastened directly to the microphone cable.

When making a dramatic-class recording, it is heart breaking to try to get proper balance of cast and effects with a single microphone, and lost time or a poor performance surely will be the outcome. Two microphones and a two-position mixer would save a lot of time and trouble. If standard professional technique is to be used, a third microphone and mixer position for the announcer would be desirable. All of this makes it desirable to provide a control room where the program balance can be set properly. Monitoring through headphones is not a good way to maintain the balance of a complex production.

We conclude with a pair of sharp remarks. The first is a paraphrase of a bit of Prof. Temple's recent article in "Audio Engineering" magazine. You cannot convince a student that he lisps if the recording machine itself suffers from a permanent lisp. Secondly, we seem to be going through a cycle very similar to that pursued during the early days of educational disc recording. At first, the educators bought the cheapest home type machines. Finding results disappointing, they changed to better and better professional machines. Today, the average educational disc recorder is of thoroughly professional quality. In the magnetic recorder field, the colleges have already begun to change to the $500-$800 class of professional machine, and it is only a question of time before the high schools do the same. History seems to repeat itself with annoying regularity.

The Telephone That Answers Itself

. . . with magnetic recording tape

The Swiss have a name for it. They call it the Ipsophone. We call it one of the most ingenious applications of tape recording that we have seen so far. In fact it "thinks"—"remembers"—and has the audacity to talk back, too!

Briefly, the Ipsophone — a Swiss invention — is an automatic telephone answering device that records messages on magnetic tape and plays them back later, when called for. No "operator" is required anywhere along the line, where dial systems are in use. Here's how it works.

You have an urgent call to make to your friend, Mr. Jones. You dial his number. If he doesn't answer after the first three rings, Ipsophone swings into action and a recorded voice says, "Hello, hello. This is the residence of Mr. Jones. Your message is being recorded automatically. Ready! Please speak now." And if you're not too surprised to remember what you wanted to say, you go right ahead and give your whole message, just as if Mr. Jones were there himself.

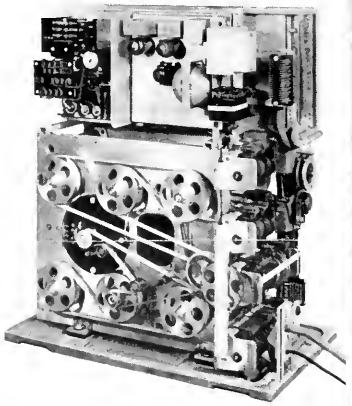
Then, when Jones gets home, he calls the Ipsophone number. As before, the tape recorded voice answers, saying "Hello, hello. This is the residence of Mr. Jones. Your message is being recorded automatically. Ready!" Right there (before it says "Please speak now") Jones breaks in, saying "Hello, hello." That makes the Ipsophone change its mind, and instead of recording a message, it automatically plays back the part of the tape that you recorded, giving your message, in your own words, exactly as you said it.

The operation described so far is a fairly simple one. Where it gets really complicated — and quite ingenious — is in the system which enables one master Ipsophone to handle many different subscribers, yet keep messages strictly confidential, to be played back only to the individual for whom they are intended. If you want the *confidential* service, your telephone is provided with a code key, on which you set a secret combination of code numbers known only to yourself. Then, when you call Ipsophone for a message, it automatically reads off a series of numbers, beginning with zero stopping for 4 seconds after each number. You simply say the magic words, "hello, hello", after each of the code numbers you selected. Your message is then transcribed back to you from the tape, as before. However, if anyone tries to "break" your code, and misses a single number, he either gets a busy signal or is disconnected. You can change your code numbers as often as you want, so there's practically no possibility of anyone "breaking" your code.

The Ipsophone recording mechanism is a compact and complicated assembly of telephone relays, timing devices, sequence switches and other sensitive electronic equipment — arranged for proper control of the multiple tape recorders.

Although a newcomer to this country, the Ipsophone has already found extensive use abroad. Department stores use them for recording after-hours orders. Banks use them to take important massages after closing time. The Geneva Journal uses them to record messages from foreign correspondents all over the world—as also does Reuters, the British news agency. In fact the Ipsophone is being widely applied for most of the applications where we, in this country, have been using a personal telephone answering service. Ipsophone, however, has the added advantage of absolute privacy — plus the infallible accuracy of a tape recording.

We may see — and hear — a lot more about this telephone recorder. For an American corporation is making arrangements with the Swiss company to mass-produce thousands of them over here. So don't be too surprised if your next telephone message is automatically recorded on tape.



Ipsophone mechanism with casing removed multiple tape recorders and associated control equipment for *fully automatic operation.* *(Photos and data, courtesy of Mechanix Illustrated.)*

Music Goes Round the World

(*Continued from Page* 1, *Col.* 1)

put on discs. Nearly all were made in radio studios or recording studios. The final recordings were made of unbreakable vinylite in a bright blue color. The album has a colorful patriotic jacket.

Screening of the 174 offerings submitted was done by a national committee made up of members of the American Junior Red Cross staff and members of the Music Educators National Conference, co-sponsors of the program. After listening for three days to Negro spirituals, love songs, folk music, classics and light opera, they chose a concert band, three full concert orchestras, three mixed choruses, two boys' choruses, three a cappella choirs, two vocal ensembles, a wood-wind ensemble, and two informal numbers. The committee selections were made upon quality of performance, quality of recording, and securing a good program balance in the six-disc album which would also represent all parts of the country.

The albums have been made available to all countries through the League of Red Cross Societies in Geneva, Switzerland. Thus far, the following countries have requested, and have been sent, an average of 30 albums each: Austria, Belgium, Czechoslovakia, Denmark, France, Germany, Iran, Japan, Norway, Sweden, Switzerland, Yugoslavia, Puerto Rico, and Australia.

The future of this novel experiment in international understanding is uncertain. There has not yet been time to receive an evaluation of the foreign reception of these albums. No plans are being made to go ahead until this has been done. If the response is favorable, streamlined methods of handling the technical details must be developed before the program can be offered to a larger number of schools enrolled in Junior Red Cross.

It is hoped, however, that like the Junior Red Cross school correspondence and the international school art program, the experimental music program will develop an understanding among the youth of many nations, providing one more "get acquainted" avenue to world peace.

DON'T BE BASHFUL! If you have any recording stories that you think would be of interest to our readers, send them in. Audio Record is now distributed, by request, to 1480 radio stations, 3950 schools and colleges, 3300 recording studios and recordists, and 950 distributors and dealers. Address contributions to: Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

audio record

THEY SPEAK FOR THEMSELVES

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 5 | 444 Madison Avenue, N. Y. C. | May, 1950

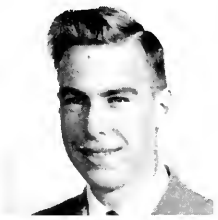
WINNERS ANNOUNCED in Radio Script Contests

Scholastic Magazines and AER Name Prize Winners in Nation-wide Contests for High School and College Students

The two big student competitions in radio script writing — Scholastic Magazines' 1950 Radio Script Writing Competition for high school students, and the Association for Education by Radio's National Radio Script Contest for college students—have announced their respective winners. The awards have been presented, and the talented young writers have achieved national recognition for outstanding ability in the radio field. To the winners — and to the hundreds of other contestants who submitted such excellent scripts — we extend our sincere congratulations.

Both of these contests, which were co-sponsored by Audio Devices for the third consecutive year, drew an all-time record of entries — making the job of final selection a more difficult one than ever before.

(*Continued on Page 2, Col. 1*)

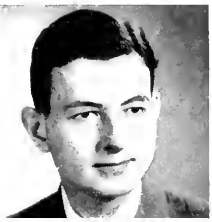


WINNERS OF SCHOLASTIC MAGAZINES' RADIO SCRIPT WRITING COMPETITION

First Prize—Original Radio Drama. Richard O. Justa, Orange, N. J.

First Prize—Radio Drama Adaptation. Richard Green, Oak Park, Ill.

First Prize—General Radio Script Bernard H. Merems, New York, N. Y.



WINNERS OF CLASSIFICATION 5 IN A E R CONTEST

First Prize—John Suchy, Missoula, Mont.

Second Prize — Janaan Noonan, Dubuque, Iowa.

Third Prize—Robert Lee, New York, N. Y.

How Sound Engineering Helped "Showboat" Win Grand Prize

By Ernest C. Knight
Diacoustic Laboratory
Pasadena, California

The 1950 Pasadena Tournament of Roses theme, "Our American Heritage", was a well chosen one and opened the way for great beauty and imagination in float design. But, in the float that took Grand Prize, this beauty was more than skin deep. It could be *heard* as well as seen.

The Southern California Edison Company's Grand Prize winner, the "Showboat", portrayed life down along the Mississippi and was the largest float to be entered in any Rose Parade. As this rose-studded replica of an old-fashioned Mississippi side-wheeler rolled down the parade

(*Continued on Page 3, Col. 1*)

The "Showboat"—Southern California Edison Company's Grand Prize Winning float in the 1950 Pasadena Tournaments of Roses. Life-like sound effects, reproduced from Audiodiscs and Audiotape contributed much to the realism of this beautiful exhibit.

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 6, NO. 5 MAY, 1950

Winners Announced

(*Continued from Page* 1, *Col.* 1)

Mr. William D. Boutwell, of Scholastic Magazines, reports that high-school students from all over the country entered a total of 569 scripts in the national contest alone — not counting the hundreds of scripts that were submitted for the many regional preliminaries throughout the country.

In the AER contest, too, the trend was upward — indicating greatly increased interest in radio work among the students of the nation's colleges and universities.

Following is a list of the national winners of the Classifications sponsored by Audio Devices in both the Scholastic Magazines and AER Contests.

SCHOLASTIC MAGAZINES' Radio Script Writing Contest (High School Students)

Judges: Leon Levine, Columbia Broadcasting System; Olive McHugh, Chairman of AER Committee on Script Writing; Gertrude Broderick, U. S. Office of Education Script Exchange; Wade Arnold, National Broadcasting Company; Lucile Fletcher, radio writer; and Eric Barnouw, instructor in radio and television at Columbia University.

Award Winners:

Original Radio Drama

FIRST PRIZE — $25.00; **Richard O. Justa**
Orange High School, Orange, N. J.
"Of Sand and Stars"
Teachers — Muriel E. Pons* and Florence J. Leonard

SECOND PRIZE — $15.00; **Ann Keller**
Edwin Denby High School,
Detroit, Mich.
"Your Loving Sister Madeline"
Teacher — Mrs. Ethel Tincher

THIRD PRIZE — $10.00; **Pattie Ann Lewis**
Johnson City High School,
Johnson City, N. Y.
"It Happens Every Day"
Teacher — Mrs. Rose Sullivan

FOURTH PRIZES — $5.00;
Roger Lee Paulson
Elkhart Senior High School,
Elkhart, Indiana
"Escape From Libby"
Teacher — Galen L. Wenger

Ronald Wolfe
St. Wendelin High School,
Pittsburgh, Pa.
"The Best Things in Life"
Teacher — Sister Mary Bernarda

Joy Longworth
Buchanan High School,
Buchanan, Mich.
"The Fallen Angel"
Teacher — Mrs. Velma E. Dunbar

Robert McGowan
Walla Walla High School,
Walla Walla, Wash.
"The Perfect Likeness"
Teacher — Marshall Alexander

Karl Allen Lamb
Centennial High School,
Pueblo, Colorado
"Greater Love Has No Man"
Teacher — Miss G. C. Knoop

Radio Drama Adaptation

FIRST PRIZE — $25.00; **Richard Green**
Oak Park and River Forest High School,
Oak Park, Ill.
"Station Q-E-D"
Teacher — Mildred Linden*

SECOND PRIZE — $15.00;
Enid F. Karetnick
Weequahic High School, Newark, N. J.
"Especially Father"
Teacher — Marie E. O'Connor

THIRD PRIZE — $10.00; **Bill Rollins**
Richard J. Reynolds High School,
Winston Salem, N. C.
"Lucius and the Child of Bethlehem"
Teacher — Mrs. Elizabeth Ritter

FOURTH PRIZES — $5.00;
Monica F. Kelly
St. Vincent Academy, Newark, N. J.
"The Long Exile"
Teacher — Sister Josephine Marie

Clare Marie Murphy
Collingwood High School,
Cleveland, Ohio.
"Mammon and the Archer"
Teacher — Mrs. Finley

Sharon Kyle
Edwin Denby High School,
Detroit, Mich.
"Cupid on the Loose"
Teacher — Mrs. Ethel Tincher

Stanley Phillips
South High School, Denver, Colorado
"Almos' A Man"
Teacher — Harold Keables

Karl Allen Lamb
Centennial High School,
Pueblo, Colorado
"A Municipal Report"
Teacher — Miss G. C. Knoop

General Radio Scripts

FIRST PRIZE — $25.00;
Bernard H. Merems
Stuyvesant High School,
New York, N. Y.
"Atomic Era One"
Teacher — Irving Robbins*

SECOND PRIZE — $15.00;
Janice Anne Chaskes
Brockton High School, Brockton, Mass.
"Raising of the Dead"
Teacher — Ruth T. Cosgrove

THIRD PRIZE — $10.00; **Morton Hytner**
Scott High School, Toledo, Ohio
"The Voice of Tomorrow"
Teacher — Roberta B. Shine

FOURTH PRIZES — $5.00;
Barbara Halladay
Cheyenne High School
Cheyenne, Wyoming
"Exploring the Mayas"
Teacher — Mildred U. Beck

Barbara Ann Black
Brockton High School, Brockton, Mass.
"An Interview with Hopalong Cassidy's Dad"
Teacher — Ruth T. Cosgrove

Ellen Van Dusen
Union-Endicott High School,
Endicott, N. Y.
"The Teen-Age Bookshelf"
Teacher — Mrs. Edna A. Finch

William T. Reedy, Jr.
Reading Senior High School,
Reading, Pa.
"Red and Black on the Air"
Teacher — Joseph G. Plank, Jr.

Gene L. Walker
Edwin Denby High School,
Detroit, Mich.
"Roving Reporter"
Teacher — Mrs. Ethel C. Tincher

AER National Radio Script Contest (College Students)

Judges: Virginia Edwards, St. Louis Public Schools; Helen Kinsella, Chicago Public Schools; Martha Boyer, Lindenwood College; Jesse Burkett, Oklahoma School of Air.

Classification No. 5. Scripts for Home and School Recording

FIRST PRIZE — $100.00;
John Suchy
Montana State University,
Missoula, Montana
"Runaway Christmas Bus"
Teacher — Ansel Resler*

SECOND PRIZE — $60.00;
Miss Janaan Noonan
Clarke College, Dubuque, Iowa
"Life of William Blake"
Teacher — Sister Mary Aquin

THIRD PRIZE — $40.00;
Robert Lee
New York University, New York, N. Y.
"My Last Duchess"
Teacher — Dr. Robert S. Emerson

***Received 25 Audiodiscs, 3 Sapphire Recording Audiopoints and 3 Sapphire Playback Audiopoints.**

Showboat (*Continued from Page 1*)

line, the multitude of spectators was enthralled to hear the nostalgic strains of a steam calliope playing such familiar favorites as, "Here Comes the Showboat", "Waiting for the Robert E. Lee" and "Cruising Down the River"— punctuated by the deep-throated note of a river-boat whistle.

Actually, there was no steam calliope on the float, and no boat whistle either. Despite the startling realism, it was all done with recorded sound — on Audiodiscs and Audiotape!

How best to make this music sound alive had a great deal to do with the construction of the float. The total dimensions of the structure were 30 feet long, 20 feet wide and 17 feet high. It had three decks and, when completed, weighed 12½ tons, so the added weight of any live band, or of a real steam calliope, was out of the question.

Mr. Lee Stratton in charge of float building for the Walter Garbett Company, consulted with us here at the Diacoustic Laboratory in Pasadena, to determine the most effective way to handle the sound and music on the float. Since we have for years been well acquainted with sound recording in both radio and the motion picture fields, our suggested solution to the problem was to record all music and necessary sound effects on Audiodiscs and then to edit the music and sound on Audiotape.

A great deal of technical checking and rechecking had to be done as the calliope music, sound effects and the whistle of the river-boats had to sound as real and live as possible with full level recording and no distortion. The music was first recorded on 12" Red Label Audiodiscs, for approval by the Edison Company Float Committee. After the most suitable music and sound effects had been selected, these were then transposed onto Red Oxide, Plastic Base Audiotape, making a half hour reel at 7½ inches per second. This then was the parade reel and was played almost continuously over the entire 7 mile parade route.

Then for the Post Parade! After the big parade, all the floats (this year there were 67) were assembled in the post parade area. This gave the visiting public a chance to view the floats at close range and to see how magnificent they really were. The "Showboat" contained over 1,200,000 blossoms.

For this post parade even a special reel of Stephen Foster's melodies was made on Red Oxide, Plastic Base Audiotape. This reel played continuously for thirteen hours, except for one minute rewind every half hour. No break occurred in the tape either during the parade or post parade playing of the reels and no loss of level or quality was noticed.

All tape recordings were made and played back on a Magnecorder No. PT6R Rack job, driven by Audio Pacific Company's Model No. 3 Amplifiers and reproduced by four multi-speaker units; a total of sixty-eight speakers which were mounted inside the float. The volume and tone of both the music and sound effects were controlled from duplicate sets of Magnecorders — operated by myself and my technician, Mr. Hubert P. Starke of Hollywood.

A smoke-making machine provided the smoke for the stacks of the "Showboat" and a 5 kw electric generating plant, operated by its own gasoline engine, provided power for the sound equipment and the motors which turned over the paddle wheels. There was even an engineer for the main power plant which drove the float, and a driver, located thirty feet forward, to steer the massive structure along its way.

Despite the great artistic beauty of the "Showboat", it is safe to say that the realistic atmosphere created by the extremely life-like recording was a big factor in awarding the coveted Grand Prize.

University of Tennessee's WUOT Uses Tape and Discs Extensively

From a two year program of ground work in which disc recordings played a major role, the University of Tennessee began FM broadcasting on October 27, 1949, with WUOT, 3000 watt outlet. A series of eight weekly programs, most of them disced with Rek-O Cut heads on Audiodiscs, was started in the fall of 1947 when Kenneth D. Wright came to the University from ten years in commercial radio. Wright organized a student Radio Workshop and produced the eight shows weekly on various subjects of adult information. Usually the programs were recorded and mailed to out of town stations in Tennessee. In 1948 the series was expanded to ten programs weekly, one of which was awarded an honorable mention in the Ohio State Exhibition of Educational Radio Programs. This show, "Songs of the People," was recorded on Audiodiscs and broadcast on WBIR in Knoxville, Tennessee.

With the heightened interest in radio and the growth of the Radio Workshop, the University constructed WUOT this year. Operating five and a half hours daily, Monday through Friday, the station offers fine music, drama, news, discussions, documentaries, and popular music. One of the major principles behind the station is to experiment with in-school listening programs for elementary and high schools of East Tennessee with a view to expanding this phase later. The station is operated with student personnel, directed by two professionals.

WUOT now has two Brush Soundmirror tape recorders, used primarily for student training and occasional remote spots, two Rek-O Cut cutting heads, M-5, used for auditions and rehearsals, and a Fairchild Unit 539-G for discs to be used on WUOT and commercial stations.

All of the informational programs on commercial stations in the state, now numbering seventeen periods weekly, are grouped under the general title of the University of Tennessee "Campus of the Air." With the four-fold purpose of AM extension programs, operating WUOT, student training, and experimentation in classroom listening, the Radio Department of the General Extension Division has undertaken a full program of bringing more mature radio from the campus of the state university.

UNIVERSITY OF TENNESSEE RADIO WORKSHOP students transcribing "Make Believe Party" for broadcast on WUOT Fridays, 6:30 P.M.

WUOT, UNIVERSITY OF TENNESSEE FM VOICE, uses Fairchild Recorder for many shows each week.

for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

AN IMPROVED LACQUER FORMULATION

C. J. LeBel

Shortly after the end of the war, a number of our best customers began clamoring for a better lacquer formulation especially designed for use as a master. This would have noise level at the inside diameters as low as at the outside, but the wear resistance could be slight.

Work on this project began in 1946 and was carried on intensively. By 1948 prewar microgroove development had been revived, and the pressure for *something* became still more intense. A considerable number of master formulae were developed and tested, but they all had one fault or another. Perhaps the worst was a tendency for the cut groove to become noisy in time. The more miraculous the groove quietness, the worse this effect became.

Emphasis finally shifted to a reproportioning of our standard formula as our faith in the magic of any one new ingredient dropped to zero. As is well known, a recording lacquer contains many ingredients, and the optimum proportions are found by experiment rather than by theory. Hundreds of tests were made, and in the summer of last year the reproportioning led to an interesting master formula. It was as quiet at the inside as at the outside, and it had none of the bad habits which the radically new developments had been cursed with. Particularly, there was no tendency for the cut groove to become noisier with time. The groove would withstand only three playings, but this was no fault in a master.

When we began to think of production we ran into an obstacle: It is not easy to change lacquers in our coating system, for the pipes have to be emptied of lacquer, then cleaned thoroughly. Since the demand for masters is small, this would have involved shutting one lacquer system down for a day to permit a day's run on masters, or else installing an additional fabulously expensive stainless steel pipe system to be used a small part of the time. Either method would have led to very high costs.

At that point it occurred to us that most of the improvement might be incorporated in our regular formulation. Tests were made, and it appeared that most of the master quietness could be incorporated in a general purpose lacquer without sacrificing wear resistance or any of the other good properties. Pilot runs were made and the results tested successfully by a number of leading recording organizations, so in the late fall we started to modify the production formulation slightly in the direction indicated. As everyone seemed pleased, and the complaints were nil, more and more modification was used, with a field test of each change before it was put into production. By mid-January we had gone over completely to the new version.

The present formulation has been used continuously since then, and any discs in your stock will be of the latest type, or within 90% of it.

Figure 1 shows the noise characteristic of the modified lacquer, for a standard transcription groove. Since it is very easy to keep a groove quiet at diameters of 12 to 16 inches, we have started our graph at 11 inches. For comparison, data on two other makes of disc is included, with all three tests run with the same stylus.

Figure 2 shows the result of a test under microgroove conditions, using a micogroove stylus instead of the standard model used in figure 1.

In both graphs the reference velocity is 8 cm per second, and the speed of rotation 33.3 rpm. Standard NAB test conditions were observed, except that the reproducing stylus radius was in accord with the type of groove to be reproduced.

The tests show that a standard transcription groove in AUDIODISC is practically as quiet at 7" diameter as at the outside. Other makes have not done as well. In microgroove the problem is more difficult, but here, also we have succeeded in greatly reducing the increase. So, the signal to noise ratio is better than 50 db from 5 inch diameter out, and better than 55 db from 6½ inches out. As the curves show, this is a significant improvement. In other respects — long wear, good thread-throw, stability of noise level with time, foolproof processing, and humidity proofing, the characteristics are unchanged.

While touching on the subject of microgroove noise, it might be well to mention something noticed on many discs sent in for criticism: The average newcomer to microgroove work cuts much too fine a groove. Whereas 70:30 groove:land ratio is considered necessary, these brave souls are cutting 40:60 groove:land. Apart from the serious increase in noise which results, such a groove will not be tracked reliably in many home reproducers. So, avoid an excessively fine groove. The added recording level which it would permit only causes excessive tracing distortion, which is responsible for the fuzzy sound (on peaks) of so many microgroove discs.

If we may be permitted to moralize, it is interesting to note that the result was obtained by using Buckner Speed's old "method of the 10%" — by pyramiding many small improvements — after the trial of "miracle ingredients" and radically new materials had wasted much time with no success.

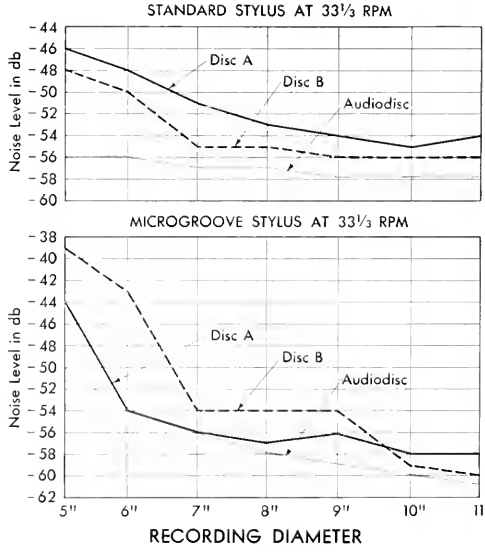


Fig. 1—Noise level vs. diameter, for various makes of discs using a standard transcription groove. All cuts made with same stylus. Reference velocity, 8 cm per second.

Fig. 2—Noise level vs. diameter, for various discs, using a microgroove. All cuts made with same stylus. Reference velocity 8 cm per second.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 6 | 444 Madison Avenue, N. Y. C. | June-July, 1950

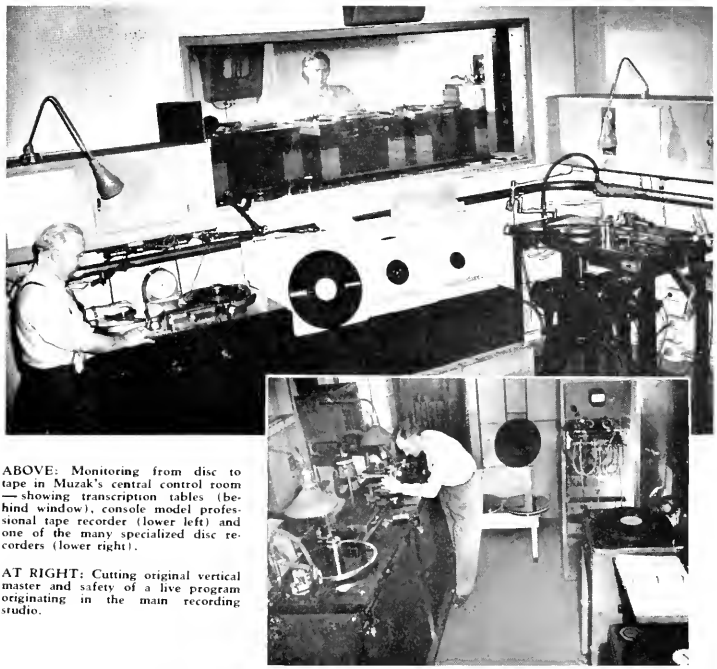
Muzak Transcription Division Makes Recording an Artistic Science

Here, in one of Manhattan's leading studios, musically talented technicians turn out top quality recordings for discriminating clients

To most people, the word "Muzak" brings to mind soft lights and sweet music from the strains of Brahms or Beethoven to the latest hits from Broadway shows, accompanied by the clink of cocktail glasses. And a menu that says "Music by Muzak."

Actually, the Muzak Franchise Service — the wired music so familiar to patrons of finer hotels and restaurants throughout this country, Canada, Mexico, Hawaii, and Puerto Rico; and to employees in many

(*Continued on Page 2, Col. 1*)



ABOVE: Monitoring from disc to tape in Muzak's central control room — showing transcription tables (behind window), console model professional tape recorder (lower left) and one of the many specialized disc recorders (lower right).

AT RIGHT: Cutting original vertical master and safety of a live program originating in the main recording studio.

Mrs. Neta Kaye Stokely at work in her home studio, making an original Audiotape recording for one of her "personalized" children's stories.

Making Records with the "Personal Touch"

Mrs. Neta Kaye Stokely's Personalized Discs Delight Youngsters from Coast to Coast

It all began with an idea. The idea that children's story records could be made much more interesting if they were given the "personal touch." And putting this idea into practice has enabled Neta Kaye Stokely (Mrs. Roy Stokely), of Oklahoma City, Oklahoma, to develop a unique and profitable recording business that she conducts in her own home, in her "spare time."

Now — instead of just listening to ordinary recorded stories about mythical fairy-tale characters—youngsters can hear about *themselves*, their pets, their playmates, and interesting events in their own lives.

At the start, Mrs. Stokely decided to try out the idea with her own two children, Craig and Jean. So, calling upon her own extensive background of radio broadcasting experience, she wrote a couple of short fairy tales, with Craig and Jean as the principal characters. These were recorded on tape and transcribed onto 10" discs. The records made a big hit with the youngsters. They would listen by the hour. They brought their friends in to listen, too — and their friends brought *their* friends. It wasn't long before the news was all over town — and Mrs. Stokely found herself with a flood of orders on her hands. Other parents wanted records about their "kids", too. They supplied the information — names of the children, their pets, their playmates, and their habits (both good and bad). These Mrs. Stokely skillfully wove

(*Continued on Page 3, Col. 3*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada

VOL. 6, NO. 6 JUNE-JULY, 1950

Muzak Transcription Division

(*Continued from Page 1, Col. 1*)

industrial plants and business offices — is but one of Muzak's diversified recording operations.

Another, very familiar to the radio field but not too widely known by the general public, is Muzak's Associated Program Service. This up-to-the-minute "Basic Library" of scripts, sales aids, and recorded music is a vital and continuing source of high quality musical program material for broadcasting stations from coast to coast. More than five thousand recorded selections are available in this library — and new ones are continually being added and distributed to subscribing stations on a "lend-lease" basis.

Keeping these two transcription services supplied with top-quality recordings is a man-sized job of itself. Yet it is but a *part* of the work handled by the Muzak Transcription Division. Their recording studios, located at 151 West 46th Street, just off Times Square, make no claim to fame as the *largest* of their kind. But they are one of the oldest and newest in existence — old in years of service to the recording art and experience of their personnel; new in ideas and equipment for the modern recording application.

In addition to turning out all recordings for Muzak Franchise Service and Associated Program Service, the Transcription Division handles a wide variety of special work for broadcasters, industrial firms, government agencies, music societies, educational institutions, program producers, and advertising agencies. They also recorded and processed and pressed all Silvertone Records — distributed nationally by Sears and Roebuck in addition to many nationally known independent labels.

The main recording studio, conveniently located on the ground floor, is big enough for a concert orchestra, and contains a full complement of percussion equipment — from a Hammond organ to chimes and kettle drums. The walls of the room are provided with a combination of fixed and adjustable baffles which enable the engineers to obtain any desired acoustical effects for any recording applications, from full orchestra to one or two voices. At one end of this studio is the control room — considerably more spacious than most, and with all controls at the fingertips of the recording engineer.

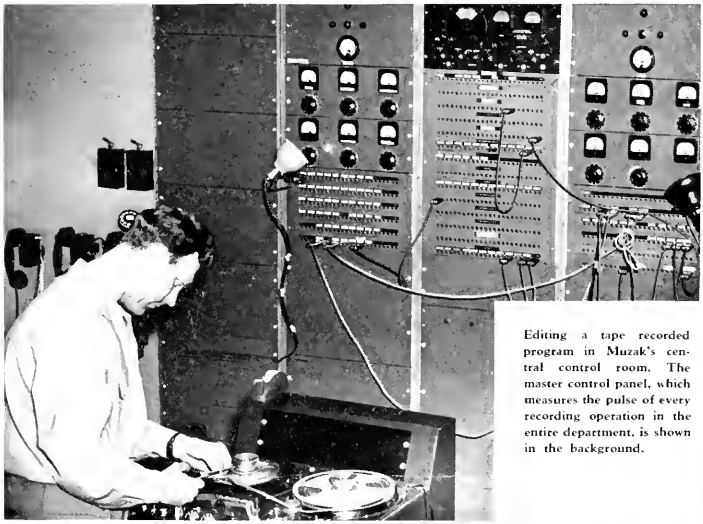
Immediately behind this is the studio recording room, containing the disc recorders for cutting the original studio masters. All of these masters are cut in duplicate, using vertical rather than lateral recording. The inherent advantages of the vertical recording provides a studio master of as life-like quality as it is possible to obtain. Although all pressings for the Franchise Division and Associated Program Service are vertical, the original masters for the other types of discs are recorded vertically, and then dubbed from vertical to lateral on Audiodiscs for manufacturing and distribution purposes. In so doing, it is felt that the final recording is of superior quality.

The central control room — virtually the nerve center of the entire department — is located on the floor above. Here a large master control panel, designed by their own engineers, measures the pulse of every operation going on in any of the various recording rooms. A unique feature of this panel is the fact that all circuit elements are in duplicate, with provision for automatic and instantaneous changeover in case of failure of any unit. Also located in this room is another bank of disc recorders for dubbing and cutting master Audiodiscs from tapes and other recorded sources.

As far as the actual recording equipment goes, the Muzak studios are not greatly different from those of other major recording firms. Muzak, however, takes par-

(*Continued on Page 4, Col. 2*)

In session—the "Deep River Boys", making a recording for the Muzak Associated Program Service.



Editing a tape recorded program in Muzak's central control room. The master control panel, which measures the pulse of every recording operation in the entire department, is shown in the background.

audio pointers for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

RECORDING, HALF PROFESSION AND HALF MEDIEVAL CRAFT

C. J. LeBel

Three years ago the writer scribbled an indignant article for the "Audio Record", bewailing the old tradition of secrecy in disc recording (and other branches of audio engineering), a tradition which was keeping it in the class of an ancient craft. It was felt that the time had come to turn a craft into a profession.

Well, three years have passed, and much has happened. We now have a professional society devoted entirely to the audio engineering field, and its local sections meet monthly to discuss audio engineering matters. We have had the first Audio Fair, the first audio convention ever held. Nevertheless, a great deal more remains to be done.

With the encouragement of the Audio Engineering Society, we have seen free verbal discussion of audio problems become generally accepted. It is not hard to get speakers on an audio subject. Everyone seems willing to share his ideas with his immediate neighbors, and this is a vast step of improvement over several years ago. But how about sharing them with the whole country? Ah, that is where the battle starts. After a year or two of prodding, poking, and pushing, it may be possible to extract an article for publication, or again it may not.

Audio engineering will not become a full fledged profession until free publication becomes as well established as free discussion. We will have to make publication as automatic in our field as in the older field of radio engineering. One of the earmarks of the medieval craft was it willingness to exchange ideas within the town, and its complete lack of interest in sharing ideas with other towns. By this token, recording is still a craft.

Now that our readers have been thus prodded, we hope to see more contributed papers on recording problems in the "Audio Record" and elsewhere.

Here are a few subjects that need more attention than they have received in print in the past:

1. Tape recording bias—there is too wide a gap between theoretical explanations of rf bias operation, and the actual rules of thumb used in the field. These rules are simple, but they lead to irreconcilable results if applied to nominally identical oxides whose bias-output curves differ even slightly.

2. Tape recorder maintenance — how often should heads be demagnetized or cleaned, or clutches adjusted? How about noise reduction compensating voltages?

3. Tape recorder operation — how about a more extended discussion of editing time savers?

4. Disc recording stylus — there is too much disparity between published data on improved stylus characteristics, and experimental results. More experimental results should be published.

5. Hot stylus process — What experiences have you had with this new method of cutting? What average and maximum stylus life is achieved?

6. Recording room layouts — In my travels a lot of nice ideas are encountered, but nobody is energetic enough to write about his improvements.

7. Speech input system improvements — these also need more attention.

8. Finally, how about circuit ideas and convenient gadgets?

The "Audio Record" would welcome articles in its field. If you have some more fundamental thoughts, the Audio Engineering Society would welcome a chance to consider them for publication. Such manuscripts should be sent to the Audio Engineering Society, Box F, Oceanside, N. Y.

We are looking forward to hearing from you.

Making Records with the Personal Touch

(*Continued from Page 1, Col. 3*)

into the same basic story patterns she had first developed — one about "The Galloping Butterfly" and the other about "The Absent Minded Cricket."

From this simple beginning, Mrs. Stokely has expanded to a profitable mail-order business, with customers in practically every state in the country. The extent to which her fame has spread is indicated by the fact that she was recently featured in the "Interesting People" section of The American Magazine. Purchasers fill out a "MY OWN STORY" questionnaire order form, giving the pertinent information about the child for whom the record is intended. Mrs. Stokely does all the rest —"personalizing" the story, making the original tape recording, and having it transcribed onto an unbreakable ten-inch disc. Normal delivery is about two weeks — the cost, $3.50 per record. Readers who are interested in this unique recording service can obtain complete details and questionnaire order forms by writing to Neta Kaye Stokely, 1620 Northwest 44th St., Oklahoma City, Oklahoma.

Mrs. Stokely makes all of her original recordings on Audiotape, right in her own home, using a portable tape recorder. She has found that she can record about five stories an hour. The tape is then sent to a local sound studio, which transcribes it into disc form so that it can be played back on any home phonograph.

The convenience of magnetic recording tape — its ease of editing and erasure — have done much to help make this venture so successful. Mrs. Stokely says: "I'm so thankful there *are* such things as tape recorders, or my little project would be much more difficult to execute. Three cheers for Audiotape."

How to Apply Paper Labels to Audiodiscs

We have received a number of inquiries as to the best method of applying paper labels to Audiodiscs. In all such cases we recommend the method used at our factory, for it has been successfully tested on several million Audiodiscs. Also, it is a method that can easily be used in any recording studio or at home, without any special equipment.

First, lightly soak the label in a small quantity of solvent, such as acetone, which can be purchased in any drug store. Even nail polish remover can be used if desired. After soaking, the excess solvent should be removed by drying the label between the folds of a handkerchief. When all free liquid has been absorbed but while the paper is still moist, carefully apply the label to the disc surface.

When dry, the label becomes permanently affixed to the disc, as the lacquer itself serves as the "adhesive".

It should be noted that lacquer solvents, such as acetone, must be *handled with caution*, as they are highly inflammable. Also, it must be remembered that if any solvent is dropped on the surface of a disc it will damage the surface and make it unsuitable for recording at that point. We therefore suggest that this procedure be practiced on a few old discs that have no further value, before using it to label new recordings. Once the technique has been mastered, it will be found extremely simple and effective.

Talking Displays Offer Newest Selling Aid

"Advox" Magnetic Tape Unit Enables Merchandise to Give Its Own Sales Talk

Tomorrow's shopper is in for a surprise or two. For the age of mechanization has now been extended to the age-old art of salesmanship.

Suppose you're shopping around for a new car. You go into a sales room and start looking around at the various models on display. Maybe you're a little relieved to find that no fast-talking salesman has buttonholed you. Emboldened by your freedom, you open the door of one of the cars to get a better look inside. Suddenly a soft, pleasant voice from out of "nowhere" invites you to step inside — to sit behind the wheel. As you do so, the voice continues to point out the many desirable features of the car. If you're particularly observant, you'll notice that the quiet, conversational voice — speaking to you alone — is coming from the loudspeaker of the car radio. It's just as if the car itself were speaking to you. A little surprised and considerably impressed, you listen to the end of the one or two minute sales message. It's told you a lot of the things you wanted to know about the car — except where it got its voice. You'd find the answer to that in the trunk compartment — a compact, magnetic tape reproducing unit, connected to the car radio and operated by a concealed switch on the car door. It's the new Advox unit — developed by Audio Displays, Inc., 241 West 17th Street, New York City.

The possible applications of Advox in the merchandising field are limited only by the imagination and ingenuity of the user. A typical example is the talking refrigerator, which gives its message when the shopper opens the door. The speaker is inside, while the reproducing unit is concealed behind the machine, or in some other out-of-the-way place. Or the talking washing machine, that starts to speak as soon as the lid is lifted. In one installation, the Advox unit is concealed in a food bin at a large supermarket. It is operated by a hose switch under a rubber mat in front of the exhibit. Whenever a shopper strolls by with her "pushcart", Advox automatically tells its story through an external loudspeaker. And, taking advantage of the fact that the shopper always looks around for the source of the voice, this unit is wired up to turn on a lighted transparency over the bin.

Through the modern medium of tape recording, Advox makes sure that the prospective purchaser always gets the desired sales message — whether a clerk is around or not. And, still more important, it makes sure that the message is always given exactly as the producer of the merchandise wants to have it told. It never forgets a point — never stutters. And the very novelty of it goes far to impress the listener.

The sales message, up to two minutes in length, is recorded on an endless roll of magnetic tape. Messages can be changed as often as desired, by substituting new tapes, which are contained in a special easy-loading cartridge. The tripping arrangement that sets the unit in operation can be of any desired type — from a simple door switch to an electric eye.

AT LEFT: This "talking refrigerator" gives its own sales talk as soon as the shopper opens the door — through the Advox speaker unit on top shelf. The reproducer unit is separately mounted out of sight.

BELOW: The Advox reproducer unit — measuring only 8¾" x 10½" x 7½", and weighing only 15 pounds — plays back recorded tapes of up to two minutes in length.

The Advox reproducer unit, developed especially for talking-display service, is unusually compact — measuring only 8¾" high by 10½" wide x 7½" deep, and weighing only 15 pounds. The tape speed is 3.75" per second, and frequency range, 100 to 6000 cycles. It operates from any 110-115 volt, 60-cycle power supply.

Muzak Transcription Division

(*Continued from Page 2, Col. 3*)

ticular pride in the experience and background of their personnel.

The type of work handled covers the complete range of the recording art — turning out everything from 16" studio transcriptions to special 3" records for a novelty item — from conventional to microgroove recordings — from tape to special wire recordings for mobile equipment.

The Muzak Transcription Division makes all of its own virgin vinylite pressings from exclusive formulations developed and manufactured in their plant, and they have recently opened a new and ultra-modern processing and pressing plant in Kentucky. The processing masters are shipped to the plant in specially designed containers which assure safe arrival at their destination.

The Muzak philosophy, if you could call it that, could probably be summed up as follows:

Recording is both a precise science and an *art*. As such it requires the finest precision equipment, and the artistic skill of recordists who know both their subject and their medium. Having these things, it is no great problem to maintain the highest standards of recording quality with minimum lost motion — and with minimum wear and tear on the client.

audio record

THEY SPEAK FOR THEMSELVES

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 7 | 444 Madison Avenue, N. Y. C. | August-September, 1950

Picture-Story of Recording Activities at one of America's Leading Producers of ET Shows

1 In less than a year, Metro-Goldwyn-Mayer Radio Attractions has developed into one of the country's leading transcribed show-makers, with more than 200 stations in the United States, Canada, Hawaii and Alaska carrying its award-winning features.

Working on both coasts, M G-M Radio Attractions turns out a roster of eight first-rate open-end ET shows which was awarded Variety's 1949-50 "New Program Development Award." The half-hour programs are based on familiar Metro screen properties like "The Hardy Family," "The Story of Dr. Kildare," "The Adventures of Maisie," and "Crime Does Not Pay." The quarter-hour commentary and interview shows feature top film personalities Lionel Barrymore, George Murphy, and Paula Stone.

Singled out by Variety as "particularly outstanding" was the "M G-M Theater of the Air" hour-long version of popular films with star casts including such notables as Frederic March and Florence Eldridge (above), Marlene Dietrich, Maurice Evans, Charles Laughton, Raymond Massey and Pat O'Brien. It is a series that, both Variety and The New York Times agree, "stood up favorably in comparison with 'Lux Radio Theater.'"

(Continued on Page 2, Col. 2)

by James F. Nickerson, Director, Psychology of Music Laboratory, University of Kansas

Stereophonic sound is not new but how to demonstrate its function in normal hearing has been difficult and expensive. The effect of two-eared orientation to a complex sound field and especially to music is of much concern to the staff of the Psychology of Music Laboratory at the University of Kansas. The task of affording classroom demonstration of stereophonic effects has been simplified by the pre-recording of various types of sound and the presentation of these materials both monaurally and binaurally. Of particular interest is the contribution of stereophonic principles to recording and transmission of music. Orchestral music so recorded seems to possess a vitality and brilliance far beyond that of our finest high fidelity single channel recordings. Even with limited fidelity of equipment the two-channel system affords a subjective realism and vitality to the recorded sound not experienced in present radio broadcast and recording techniques.

Stereophonic recording equipment in use at Psychology of Music Laboratory, University of Kansas. Set-up shown includes two Pentron recorders in tandem, matched right and left field speakers, and binaural headset.

By means of two Pentron *Astra-Sonic* (T-3) tape recorders the Music Laboratory has been able to record conveniently musical events on the campus, and set up classroom demonstrations of the phenomenon of stereophonic listening.

Essentially the phenomenon is produced by the slight differences to be found in the sound wave patterns at either ear. These slight differences in time, intensity and quality are sufficient to afford the mind additional means of organization and orientation to the sound field not available in our single channel recording processes. The slight and subtle differences to be found between the two patterns are crucial not only to right median left orientation to sound but to some extent to all directional orientation. This directional orientation afforded by the mind's reaction to the contrast in stimuli at each ear is responsible for the marked gain in "fidelity" and reality of recorded sound, particularly music.

To achieve a simple means of two-channel recording in order to preserve these subtle differences in recording, the recording shoes of one of the tape recorders (T-3 Pentron *Astra-Sonic*) were removed and re-inserted with the brass magnetic insulation to the top. On the standard Pentron recorder the brass strips are on lower half of shoe thus making the recording on the upper half of the tape as it passes the recording shoe. Linking the two recorders in tandem

(Continued on Page 2, Col. 1)

audio record

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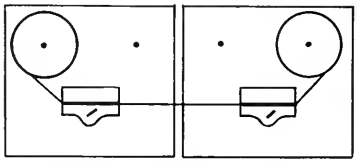
VOL. 6, NO. 7 AUG.-SEPT., 1950

Stereophonic Recording

(*Continued from Page* 1, *Col.* 3)

by passing the tape from left to right as indicated in the diagram below, one channel was recorded on the lower half of the tape and the second channel on the upper half. In case of any marked discrepancy in drive shaft speed between the two machines, the rubber pressure wheel can be removed from the machine to the right.



Schematic diagram of set-up for stereophonic recording, with two modified Penteon Astra-Sonic Recorders operating in tandem.

As long as the positions of the two recorders remained unchanged the time relationship between the two channels was maintained. Any alteration of position of either recorder would result in gross distortion.

For demonstration purposes each channel can be carried to the same speaker but the stereophonic phenomenon does not emerge. Using a single microphone for pickup, identical signals can be placed on each channel. Even though the two signals are carried to separate right and left speakers the stereophonic effect does not emerge. Slight shift in the position of the two recorders can simulate the stereophonic effect or produce echo effect when channeled through the same speaker. The optimum in producing the stereophonic effect seems to be achieved by spacing the two microphones about fifteen inches apart and facing outward at an angle of 45° from a line drawn from sound source to a point midway between the two microphones. The field speakers should be spaced well apart and turned inward slightly toward the center of the room.

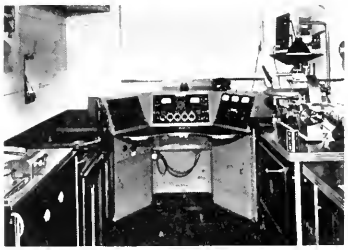
A simple check on the amount of error introduced by the possible differences in capstan speeds of the two recorders was achieved by use of Lissajous figures on an oscilloscope. Fluctuations observed when

(*Continued on Page* 10, *Col.* 1)

Behind the Scenes at WMGM

(*Continued from Page* 1, *Col.* 3)

2 But sharing equal billing with scripts and casts was the first-rate quality of the platters. When M-G-M Radio Attractions entered the program transcription business, the company built what knowledgeable recording engineers consider one of the finest recording set ups in the United States. It involved an investment of more than $100,000 in precision equipment to meet all professional standards of performance. Shows produced on the East Coast originate in the modern studios at 711 Fifth Avenue where they are under personal supervision of Production Chief Raymond Katz and Director Marx B. Loeb (seated). The special RCA 10-position console has facilities for filters and feeding to echo and reverberation chambers.



3 Shows are piped from control room mixing consoles to one of the recording rooms (above) where a master and a safety are recorded simultaneously on Ampex tape recording machines. Compact recording rooms also contain Scully Lathes, Cook Cutters and Amplifiers, Fairchild playback machines, Fairchild cutting machines, and Cook re-recording consoles featuring quality control amplifiers.

4 Tape goes to editing room for editing and timing by Edgar Small (right), assistant to Production Chief Katz. Following the script, Small eliminates fluffs, coughs and other extraneous noises, tightens cues. In addition to "M-G-M Theater of the Air" and "Crime Does Not Pay," both of which are transcribed in New York, shows taped on the West Coast are flown East for editing and mastering.

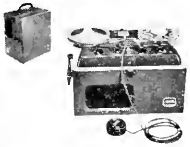
5 Actual cutting, inserting and splicing of tape is done by a staff of four recording engineers under the direction of Paul C. Baldwin (right), chief recording engineer.

6 After editing, show is returned to recording room where it is transferred through re-recording console and a special quality-control amplifier to a master disk on the Scully lathe.

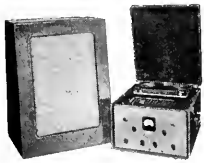
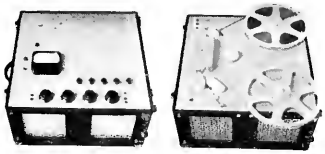
Resultant platters have earned for themselves an immediate acceptance from stations throughout the country, Canada, Alaska and Hawaii.

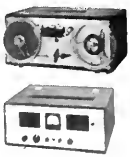
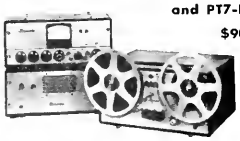
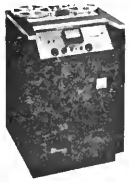
QUICK FACTS ON MAGNETIC TAPE RECORDERS

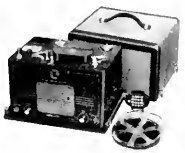
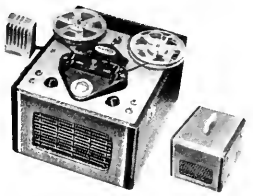
(Additional Information can be obtained by writing to the manufacturer)

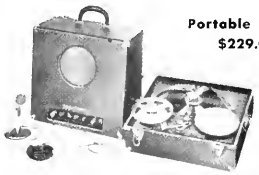
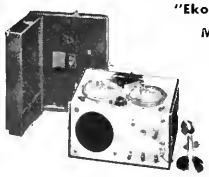
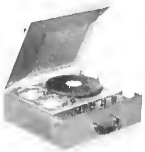
Manufacturer	Model and Price	Frequency Response	Data	Tape
AMPEX ELECTRIC CORPORATION **Howard Ave. at Laurel, San Carlos, California**	 **Portable Model 400** **$750.00**	**50-15,000 cycles (±2 db) at 15"/sec.** **70-10,000 cycles (±2 db) at 7½"/sec.**	Portable, dual-track recorder, with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, over 55 db at either speed. Either half-track or full-track recordings can be played back without changes in adjustment. Separate record and playback heads. Instantaneous starting. Rewind time, 1½ min. Simultaneous monitoring. Weight—approx. 60 lb.	**Wound with OXIDE IN**
	 **Console Model 300C** **$1,575.00**	**50-15,000 cycles (±2 db) at 15"/sec.**	Professional-type, single-track recorder, with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers. Rewind time, 1 min. for full NAB reel. Design flexibility permits modifications for special applications, including multi-channel recording and response beyond 30 KC. Also available in portable and rack-type units.	**Red Oxide, Plastic Bose Recommended**
AMPLIFIER CORPORATION OF AMERICA **396-398 Broadway, New York 13, N. Y.**	 **"Twin-Trax Magnemuse" Model 810B (7½"/sec.) $285.00**	**50-9,000 cycles (±3 db) at 7½" sec.**	Portable, dual-track recorder, with automatic reversal—giving up to 1 hour continuous play on 7" reel. Dynamic range, 45 db. Input channels for microphone and radio-phono. Total distortion, less than 3%. Shuttle speed in both directions. Weight—42 lb.	**Wound with OXIDE OUT**
	Model 810C (15"/sec.) $345.00	**30-13,000 cycles (±2 db) at 15"/sec.**		
	 **"Mognemaster Consolette" Model 815** **$395.00**	**50-15,000 cycles, at 15"/sec.** **50-10,000 cycles, at 7½"/sec.**	Single or dual-track recorder with tape speeds of 15 and 7½" per second. Separate heads for erase, record and monitor. Simultaneous monitoring while recording. Dynamic range, 50 db. Shuttle speed in both directions.	**Red or Black Oxide, Plastic or Paper Base**
	 **"Twin-Trax Magneromo" Model 910B** **$495.00**	**50-9,000 cycles (±3 db) at 7½"/sec.**	Portable, dual-track recorder, with 7½" tape speed and automatic reversal—giving 4 hours continuous play on 13½" reel. Tape speed, 7½" per sec. Microphone included. Weight—55 lb. Other data same as for "Twin-Trax Magnemuse" above.	
AMPRO CORPORATION **2835 North Western Ave., Chicago 18, Ill.**	 **"Ampro-Tape" Model 731** **$109.50**	**100-7,000 cycles, at 3¾"/sec.**	Portable, dual-track recorder with 3¾" tape speed—giving 2 hours playing time on 7" reel. Input channel for microphone, radio or phone connection. Rewind time, 4 min for 7" reel. Includes microphone, 5"x7" PM speaker, and jack for external speaker or earphones. Weight—17 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
BELL SOUND SYSTEMS, INC. **555 Marion Rd., Columbus 7, Ohio**	 **"RE-CORD-O-fone" Model RT-65** **$169.50**	**70-8,000 cycles (±3 db) at 7½"/sec.**	Portable, dual-track recorder with 7½" tape speed. Rewind ratio 6 to 1. Includes crystal microphone, 6" PM speaker, inputs for microphone and radio-phono, and headphone monitoring jack. Weight—33 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**

Manufacturer	Model and Price	Frequency Response	Data	Tape
BERLANT ASSOCIATES 4917 West Jefferson Blvd., Los Angeles 6, Cal.	**"Concertone" Model 1401**  **$345.00**	**40-15,000 cycles (±2 db) at 15"/sec.** **40-7,500 cycles (±2 db) at 7½"/sec.**	Professional type single or dual track recorder mechanism and electrical chassis for console installation. Tape speeds, 15" and 7½" per sec. Signal-to-noise ratio, over 50 db. Fast forward and rewind time, 1 min. for 10½" reel. Separate record, erase, and playback heads. Monitors while recording. Carrying case and console available. Weight —50 lb., in case, with 8" speaker.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
THE BRUSH DEVELOPMENT CO. 3405 Perkins Ave., Cleveland 4, Ohio	 **"Soundmirror" Model BK-414 $199.50** **Model BK-414S $209.50**	**To 5,000 cycles, at 7½"/sec.** **To 3,800 cycles, at 3¾"/sec.**	Portable, single-track unit, available with 7½ or 3¾" tape speeds—providing 30 to 60 minutes recording time. BK-414 has automatic rewind. BK-414S has manual mechanism. Signal-to-noise, 40 db. Flutter, 0.3% RMS. Fast forward and rewind, 75"/sec. Inputs for microphone, radio-phono. Output, 3 ohms +30 dbm. Includes 6" PM speaker and crystal microphone. Weight — 38 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
	 **"Soundmirror" Model BK-411 $199.50 (mahogany) $209.50 (blond)** **Model BK-427 $209.50 (mahogany) $219.50 (blond)**	**To 5,000 cycles, at 7½"/sec.** **To 3,800 cycles, at 3¾"/sec.**	Table model, single-track units available with 7½ or 3¾" tape speeds—providing 30 or 60 minutes recording time. BK-411 has automatic rewind. BK-427 has manual mechanism. Signal-to-noise, 40 db. Flutter, 0.3% RMS. Fast forward and rewind, 75"/sec. Inputs for microphone, radio-phono. Output, 3 ohms +30 dbm. Includes 8" PM speaker and crystal microphone. Weight—34 lb.	
	 **"Soundmirror" Model BK-428 $249.50 (mahogany) $259.50 (blond)**	**To 7,000 cycles, at 7½"/sec.**	Educational Model, similar to BK-411 above, except as follows. Has higher output and superior quality and volume for large classrooms. Includes RCA accordion cone speaker. May be played through radio, separate speaker, amplifier or PA system. Manual mechanism. Cabinet has handles for easy carrying.	
CRESTWOOD RECORDER CORP. 624 West Adams St., Chicago 6, Ill.	 **"Magictape" Model CP-201 $189.50** **Model CP-201FF $199.50**	**50-8,000 cycles, at 7½"/sec.**	Portable, dual-track recorder with 7½" tape speed. Rewind time, less than 2 min. Microphone and radio-phono input channels. Includes crystal microphone and 6"x9" speaker. Model CP-201FF has fast forward time of 1 min. 20 sec. for 7" reel. Weights—27 lb. (CP-201), and 29 lb. (CP-201FF).	**Wound with OXIDE OUT** **Red Oxide, Plastic Base**
EICOR, INC. 1501 West Congress St., Chicago 7, Ill.	 **Portable Model 115** **$144.95**	**80-7,500 cycles, at 7½"/sec.**	Portable, dual-track recorder with tape speed of 7½" per sec. Removable capstan permits conversion to 3¾" per sec. Rewind speed, 6 to 1. Crystal microphone and speaker included. Weight—27 lb.	**Wound with OXIDE IN** **Black Oxide Paper Base or Red Oxide Plastic Base**
FAIRCHILD RECORDING EQUIPMENT CORP. 154th St. and 7th Ave., Whitestone, N. Y.	 **Console Model Unit 125** **$2,750.00**	**50-15,000 cycles (±1 db) at 15"/sec.**	Professional type, single-track recorder with 15" tape speed (7½" and 30" models available). Total noise and distortion -64 db (ref. 2½% dist.). Adjustable bias. Speed tolerance, 0.1%. Built-in VU meter and circuit checking. Unit-type, plug-in chassis. Automatic stop — instant braking and reversal.	**Wound with OXIDE IN** **Red Oxide Plastic Base**

Manufacturer	Model and Price	Frequency Response	Data	Tape
RANGERTONE INC. 73 Winthrop St., Newark 4, N. J.	**Portable Model R-5P** **$2,025.00** 	**45-15,000 cycles (±2 db) at 15" sec.** **50-8,000 cycles (±2 db) at 7½" sec.**	Professional-type, single-track, dual-speed recorders, with choice of 3¾", 7½", 15" or 30" per sec. tape speeds. Distortion less than 2% total harmonic. Maximum signal-to-tape noise, 55 db. Peak flutter, less than 0.1% at 15"/sec. Rewind speed, 0 to 250"/sec. Meets all NAB adopted standards. Complete monitoring and mixing facilities. VU meter, signal indicator and footage counter. Also available with positive "sprocketless" synchronization for motion picture and TV applications. Weight of portable model—drive unit, 65 lb.; playback amp., 52 lb.; record amp., 37 lb.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic Base**
	 **Console Model R-5C** **$3,000.00**	**45-15,000 cycles (±2 db) at 15"/sec.** **50-3,000 cycles (±2 db) at 7½"/sec.**		
RCA	A new RCA Professional Tape Recorder, Type RT-11A, will be available in February, 1951. This will be described in a later issue of Audio Record. For information, write to RCA Victor Division, Camden 2, New Jersey.			
REVERE CAMERA CO. 320 East 21st St., Chicago 16, Ill.	 **Portable Model T-100** **$159.50** **Model TR-200 (with radio)** **$199.50**	**To 7,500 cycles (±3 db) at 3¾"/sec.**	Portable, dual-track recorder with 3¾" speed—giving up to 1 hour recording on 5" reel. Signal-to-noise ratio, over 45 db. Rewind speed, 102.5"/sec. Fast forward, 37.5"/sec. Neon recording level indicator. Inputs for microphone and radio-phono. Outputs for external speaker or headphones. Microphone and 5"x7" PM speaker included. Weight — 25 lb.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic Base**
SONAR RADIO CORP. 59 Myrtle Ave. Brooklyn 1, N. Y.	**Portable Model RPA-1**  **$275.00**	**40-9,500 cycles (±2¾ db) at 7½"/sec.**	Portable single and dual-track recorder (automatic reverse), with 7½" tape speed. Harmonic distortion, less than 2%. Signal-to-noise ratio, 50 db. Fast forward and reverse, 30"/sec. Includes VU meter, attenuator, equalizer and 5" dynamic monitor speaker. Weight—40 lb.	**Wound with OXIDE OUT** **Red Oxide, Plastic or Paper Base**
	Portable Model T-10 **$395.00** 	**35-9,500 cycles (±2 db) at 7½" sec.**	Portable dual-track recorder (automatic reverse) with 7½" tape speed. Harmonic distortion, 1%. Signal-to-noise ratio, 55 db. Rewind, 30"/sec. Four input channels, VU meter, attenuator, equalizer, gain and tone controls. Power supply and speaker in separate case.	
THE STANCIL-HOFFMAN CORP. 1016 North Highland Ave., Hollywood 38, Cal.	 **"Minitape" Model M4** **$212.50**	**100-5,500 cycles (±2 db) at 7½" or 15"**	Portable, single-track recorder with tape speeds of 3¾, 7½ and 15" per sec. Signal-to-noise ratio, at least 35 db. Completely self-contained battery operated unit (recording only). Weight—13 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	Model R4 **$1,670.00** 	**50-15,000 cycles (±1 db) at 15"/sec.**	Portable, professional-type, single-track recorder with tape speeds of 7½ and 15" (or 15 and 30") per sec. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers with independent monitor amplifier and speaker.	

Manufacturer	Model and Price	Frequency Response	Data	Tape
MAGNECORD INC. 360 North Michigan Ave., Chicago 1, Ill.	**Portable Model PT6-JA** **$548.00** 	**50-15,000 cycles (±2 db) at 15"/sec.**	Portable, single-track recorder, with interchangeable capstans for 15 and 7½" tape speeds. Two separate heads. Combination record/playback amplifier. Low impedance mike input, bridging input, monitor speaker, O-level output terminal, VU meter, terminal for external speaker.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	 **Portable Model PT63-JA** **$721.00**	**50-15,000 cycles (±2 db) at 15"/sec.**	Same as above, except with three separate heads for erase, record, and playback for monitoring from tape while recording. PT63-J amplifier has separate record and playback amplifiers, and switch for equalization at 7½ and 15" tape speed.	
	Portable Model PT7-A Recorder and PT7-P Amplifier **$908.00** 	**50-15,000 cycles (±2 db) at 15"/sec.**	Portable, single-track recorder, with 15 and 7½" tape speeds. Three separate heads. Safety-interlocked push button controls. Signal-to-noise ratio, over 55 db. Separate record and playback amplifiers—equalization at both speeds. Three microphone inputs and bridging input. Includes VU meter, monitor speaker, and output for external speaker.	
	 **Console Model PT7-CC** **$950.00**	**50-15,000 cycles (±2 db) at 15"/sec.**	Complete console combination including PT7 recorder (as above) and PT7-C line-level amplifier. Separate record and playback amplifiers. Headphone jack. Switch for 7½ and 15" equalization. Switch for record, playback or bias reading on 4" VU meter. Black enamel finish with burn-proof Formica top and chrome trim.	
PRESTO RECORDING CORP. P. O. Box 500, Hackensack, N. J.	 **Portable Model PT-900** **$799.00**	**To 15,000 cycles, at 15"/sec.**	Portable, professional-type, single-channel, dual-speed recorder, operating at 15 and 7½" per sec. Three separate heads, for erase, record, and playback. Three microphone channels. Fast forward and reverse. VU meter.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
	 **Model RC-10-14** **$684.00** **Model RC-10-24** **$761.00**	**To 15,000 cycles, at 15"/sec.**	Professional, single-channel, dual-speed recorders (15" and 7½"/sec.) for rack mounting. Three separate heads, permitting monitoring from tape while recording. Three-motor drive mechanism. Fast forward and reverse. RC-10-14 controlled by rotary type selector switch. RC-10-24 completely push-button controlled. Can be arranged for remote operation.	
	 **Console Model SR-950** **$2,785.00**	**30-15,000 cycles (±1 db) at 15"/sec.**	Professional, single-channel recorder, with 15 and 7½" tape speeds (15" and 30" optional). Signal-to-noise ratio, over 60 db below max. signal. Fast forward and reverse, 240 ft./sec. Three separate heads. VU meter. Amplifier and power supply units on hinged panel.	

Manufacturer	Model and Price	Frequency Response	Data	Tape
THE GENERAL INDUSTRIES COMPANY Elyria, Ohio	**Tape-Disc Recorder Assembly** **Model 250 $79.50** 	(depends on amplifier used)	Combined disc and tape recorder assembly for installation in console or portable case. Tape speed, 3¾"/sec., dual track. Fast forward and reverse. PM erase. Takes 5" reels. Disc recorder cuts and plays back up to 10" discs, at 78 rpm. Records from tape to disc and vice versa — and from microphone or radio to disc or tape.	Wound with OXIDE IN Red or Black Oxide, Plastic or Paper Base
MARK SIMPSON MFG. CO. INC. 32-28 49th St., Long Island City 3, N. Y.	 **"MASCO" Model LD-37 $169.50** **Model LD-37R (with radio) $199.50**	80-8,500 cycles (±3 db) at 7½"/sec. 80-5,000 cycles (±3 db) at 3¾"/sec.	Portable, dual-track, dual-speed recorders, arranged for instant change from 7½ to 3¾" per sec. Up to 2 hours recording time available on 7" reel. Signal-to-noise ratio, 45 db at 7½". Automatic equalization. Neon recording level indicator, volume and tone control, monitor switch, 6" PM speaker, and microphone. AC erase and bias. Microphone and radio-phono inputs. External speaker and amplifier outputs. Available with or without built-in AM tuner. Weight of mechanism (less case), 28 lb. Models LD-37 and 37R, without carrying case. Models D-37 and 37R, with two-tone tweed carrying case. Models DC-37 and 37R have metal cover with carrying handle. Cover operates interlock switch and can be locked with key.	Wound with OXIDE IN Red Oxide, Plastic Base
	 **"MASCO" Model DC-37 $179.50** **Model DC-37R (with radio) $209.50**			
	 **"MASCO" Model D-37 $179.50** **Model D-37R (with radio) $209.50**			
OPERADIO MFG. CO. St. Charles, Ill.	 **"Du-Kane" Portable** **$189.50**	50-8,000 cycles, at 7½"/sec.	Portable, dual-track recorder with 7½" tape speed. Power output, 7 watts. Input channels for microphone and radio-phono. Output jacks for headphones and external speaker. Rewind time, 80 seconds for 7" reel. Microphone and built-in 6"x9" speaker included. Weight—26 lb.	Wound with OXIDE OUT Red Oxide, Plastic or Paper Base
THE PENTRON CORP. Chicago 16, Ill.	**Portable Model 9T3 $167.50** 	50-8,000 cycles, at 7½" sec. 50-5,000 cycles, at 3¾"/sec.	Portable, dual-track, dual-speed unit (7½" and 3¾")—providing 2 hours recording on 7" reel. Signal-to-noise ratio, 50 db. Flutter less than 0.5%. Fast forward and rewind ratio, 20 to 1. Inputs for microphone and radio-phono. Outputs for headphones, external speaker, and PA system. Includes 6" PM speaker and crystal microphone. Weight —28 lb. Other models also available.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
PERMOFLUX CORPORATION 4900 West Grand Ave. Chicago 39, Ill.	**Permoflux "Tope-Riter" $279.50** 	Ample for all voice recording	A desk-type magnetic tape recorder designed primarily for office use as a dictating machine—also applicable to many other business purposes. Features special "cartridge" loading which eliminates threading. Automatic erase. Simplified controls. Microphone includes stop-start switch. Weight—20 lb.	Wound with OXIDE IN Black Oxide, Paper or Plastic Base

Manufacturer	Model and Price	Frequency Response	Data	Tape
TAPETONE MFG. CORP. Sales Office: Broadcasting Program Service, 23 W. 45th St., New York 19, N. Y.	 Portable Model $229.00	100-8,000 cycles, at 7½" sec. 100-6,000 cycles, at 3¾" sec.	Portable, single-track recorder operating at 7½" per sec. (3¾" optional), with built-in 78 rpm record player. Hum level, 40 db below normal operating level. Rewind time, 7 min. Neon volume indicator lamp, 8" PM speaker and crystal microphone. Weight—approx. 40 lb.	Wound with OXIDE OUT Red Oxide, Plastic Base
UNIVERSAL ELECTRONICS SALES CORP. 1500 Walnut St., Philadelphia 2, Pa.	 "Reelest" Model C-1-A $219.00	70-8,000 cycles (±3 db) at 7½"/sec.	Portable, dual-track recorder with 7½" tape speed and automatic reversal, giving 1 hour continuous play on 7" reel. Signal-to-hiss, 60 db. Signal-to-hum, 50 db. Fast forward and rewind. Electronic recording level indicator. Inputs for microphone, phono and radio. Output for external speaker or PA system. Weight—34 lb.	Wound with OXIDE OUT Red Oxide, Plastic Base
WEBSTER ELECTRIC CO. Racine, Wisc.	"Ekotape Pla-Mate" Model 109  $156.50	60-4,000 cycles, at 3¾"/sec.	Portable, dual-track recorder with 3¾" tape speed—giving 2 hour recording time on 7" reel. Fast forward and rewind, 75" per sec. Neon recording level indicator. Input jacks for microphone and radio-phono. Output jack for external speaker. Includes 5"x7" PM speaker and crystal microphone. Weight —34 lb.	Wound with OXIDE IN Black Oxide, Paper Base
	 "Ekotape" Portable Model 101-4 $369.50 Model 102-4 $407.00	60-7,000 cycles, at 7½"/sec.	Portable, single-track recorder with 7½" tape speed. Fast forward and rewind, 75" per sec. Electronic eye recording level indicator. Inputs for microphone and radio-phono. Output for external speaker. Includes 8" PM speaker. Weight—50 lb. Model 101-4 includes crystal microphone. Model 102-4 has 500 ohm input and additional 500 ohm output for telephone lines.	
	 "Ekoptape Network" Model 105 $595.00	70-7,000 cycles (±3 db) at 7½"/sec.	Portable, single-track recorder with 7½" tape speed. Signal-to-noise ratio, over 35 db. Total speed variation, less than 1%. Fast forward and rewind, 75"/sec. VU meter. PM and HF erase. Jacks for 2 low level or 1 bridging input. Two 500 ohm (0 dbm) outputs and 1 monitoring jack.	Wound with OXIDE IN Red Oxide, Plastic Base
WILCOX-GAY CORP. Charlotte, Mich.	 "Recordio" Model 1B10 $149.95	85-6,000 cycles, at 1.875"/sec.	Portable, dual-track unit giving 2 hours recording on 5" reel. Includes phonograph turntable and pick-up for recording from disc to tape. Rewind time 1½ min. for 5" reel. Jack for external speaker. Recording level indicator. Includes 6" oval speaker and crystal microphone. Weight —21 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
	 "Recordio" Model 1C10 $187.50	65-8,500 cycles, at 1.875"/sec.	Portable, single-track unit giving 1 hour recording on 5" reel. Includes disc recorder and reproducer. Records from tape to disc and vice versa, and from microphone or radio-phono to disc or tape. Fast forward and reverse. Automatic stop. Recording level indicator. Jack for external speaker. Includes 5"x7" oval speaker and microphone. Weight —27 lb.	

NOTE: All prices listed are subject to change without notice. Consult manufacturer or local dealer for exact price, as some prices are list and others net.

audio pointers for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

A SURVEY OF TAPE RECORDERS

C. J. LeBel

Last year we published a survey of the many tape recorders then reaching the market, and considerable interest was expressed by our readers. Now another season has rolled around, and we present the newest developments once again. Over 40 machines, from 24 manufacturers, are listed.

Although three different applications cover most uses of tape recording (home, educational, and broadcast), one business recorder has also been listed. The needs of these fields differ widely, and the tabulated data should enable one to select the most suitable machines for a given job.

Some Trends

It is interesting to note that only 7% of the machines call for black oxide tape alone. 93% use red oxide or either type. At this rate, black oxide tape will probably be obsolete in another year. The same degree of standardization has not yet been achieved in direction of wind, though already over 75% of the machines and over 80% of the manufacturers prefer the oxide in wind. As older designs are scrapped, we may expect the oxide-out wind to disappear.

When we said that the limit to frequency response lay in the machine and its heads, and not in the tape — they all laughed. But recent developments have vindicated us, for many of the latest machines have increased the frequency range per inch of tape speed by 50% or more, as compared to previous practice. This has led to lower tape speeds, wider use of smaller reels, and smaller and lighter machines, without loss of recording time or quality. The use of twin recording tracks has also helped this trend, and about half of the machines listed are of that variety.

In the professional machine field, the year has seen improvement in drive systems. Three-motor designs have become available at lower cost, and friction clutches of improved quality have also come into use. As a result, flutter is now often less than it has been.

At the same time, reduced distortion and improved signal to noise ratio have resulted from improved purity of bias wave, and from better amplifier design.

Experience of the past year has served to better define the requirements in various fields, to the point where a little comment might be in order.

Home Applications

Home uses for tape machines may be divided into two classes — wide and narrow range.

For speech only — party entertainment, baby's first words, and the like, uniform response to 5 kc is surely adequate. For music, particularly long selections and full programs, the range must be greater if the quality is to even approximate that of the latest microgroove recordings. An acceptable range would be to 8 kc, but 10 kc would be closer to the quality of many discs. Home equipment of this nature is, surprisingly, available from many manufacturers.

A magic eye tube makes a much better volume indicator than does a flashing neon lamp, and where recording overload must be avoided the former is essential. A meter would be even better.

While the typical home recorder has a signal to noise ratio of the order of 40 db, it should be remembered that many microgroove discs achieve 50 db.

Education

Gradually, it has been realized that a recorder for *general* school use must provide *faithful* reproduction, not merely pleasing sounds. Some aspects are less stringent, but the most important applications demand this very rigorously. Experiments by Prof. William J. Temple and the writer seem to indicate a need for uniform response up to at least 7.5 kc in these cases.

The frequency range cited is from microphone input to speaker output, so that a good microphone is essential. Because the usual classroom is too reverberant, a directional microphone is preferable. This in turn demands higher pre-amplifier gain than is sometimes provided.

Since the built-in loudspeaker is usually inferior in quality to the recorder itself, it is necessary to provide an external wide-range speaker and circuit means to feed it. If regularly needed, as in a speech class, the speaker could well be fastened to the classroom wall. In other cases it could be mounted on the same cart as the recorder.

For volume indication a meter is preferable, though a magic eye tube is acceptable for less critical applications. If a meter is provided, it would be very handy to be able to use it to check bias. Any machine used as often as in schools should have front panel means for checking bias every day.

While the most common school need is for a machine with one high gain (microphone) input and one medium gain (radio) input, dramatic work may demand three or four input positions for as many microphones, used simultaneously. In that case, the only recourse is to a broadcast type machine. Many colleges have done this.

Broadcasting

Frequency range requirements have been well standardized by the NAB, but there is considerable need for a light AC operated portable machine of full broadcast quality. Too many stations have been forced into using poor equipment for remote jobs, because 60 or 70 pounds of equipment was too much to carry.

Such a machine might have only a single microphone input, but it would have full frequency range and signal to noise ratio.

Because of the importance of at least approximately correct bias, it would be very desirable to include provision for checking bias current by meter.

Yes, tape recorder designs have improved a great deal in the past year.

Stereophonic Recording

(*Continued from Page 2, Col. 1*)

one channel was introduced to the vertical plates and the other channel to the horizontal plates were no greater than those introduced when either recorder was checked against an identical signal from a signal generator.

Classroom demonstrations are being achieved by use of two matched right and left field speakers and by means of binaural headsets. Since all demonstration sound can be pre-recorded the task of classroom demonstration is considerably simplified and made more effective.

The Psychology of Music Laboratory sponsored by the Department of Music Education at the University of Kansas expects to continue demonstration and research in the area of stereophonic orientation to sound. The staff feels that stereophonic sound is here to stay in recording and transmission of sound. It is a practicable and realizable recording condition for commercial developments, for the home phonographs, for amateur recordings and perhaps for sound motion pictures.

*Less than Carton Lots of 25

From time to time we have had requests for Master Audiodiscs packaged in quantities of less than 25 discs per box.

To meet such requirements, double face Master Audiodiscs, in 13¼" and 17¼" sizes are now available packaged 5 discs per box.

The unit price for these discs, when purchased in quantities of 5 per box, is the same as for quantities of 25 per box—$3.05 list for 13¼" double-face Masters, and $5.10 list for 17¼" double-face Masters.

This alternate method of packaging has been made available only on double-face Masters.

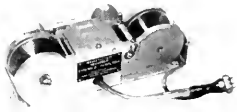
The AUDIO FAIR for 1950 will be held at the Hotel New Yorker, New York City, on October 26th, 27th, and 28th — in conjunction with the Second Annual Convention of the Audio Engineering Society.

This second AUDIO FAIR — the only exhibition devoted *exclusively* to sound recording materials and equipment — promises to be even bigger and better than the first one, which was held last year, at the same place. Two whole floors have been reserved for exhibitors, and visitors will have an opportunity to see *—and hear —* the latest developments in every field of sound recording and reproduction. There is no charge for admission.

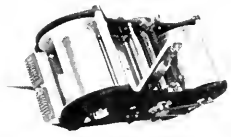
Audio Devices will be there, of course. And we cordially invite you to visit our exhibit, in Room 651.

Magnetic tape recorders are now available for the recording and interpretation of variable or transient data — for ground applications or airborne use under severe shock accelerations.

The Cook Research Laboratories, 1457 Diversey Parkway, Chicago 14, Ill., has developed the following multi-channel recorders — designed for incorporating into vehicles, aircraft or other mobile equipment. When used with suitable coupling equipment and sensing instruments, they provide a complete data recording system.



Type MR-3 — Includes 6 information plus 1 reference channel, with a recording time of 3 minutes at tape speed of 10" per sec. Its small size (8⅜ x 2⅞ x 3¾") and light weight (3 lb.) make it especially suitable for guided missile and airborne use



Type MR 12 — Includes 50 information, 4 reference, 2 marker and 6 spare channels. It has a tape speed of 14 2" per sec. and a recording time of 5 minutes. It is designed for airborne use, to withstand impact shocks of 15 G's. Weight, 25 lb. with tape.

Further information on these, or other custom-built data recorders, can be obtained by writing to Cook Research Laboratories.

ANY QUESTIONS? If you have any questions on the operation or application of disc or tape recording equipment, please send them to Audio Record, 444 Madison Ave., New York 22, N. Y. We will refer them to our technical experts and publish the answers in a subsequent issue.

12 Complete, Prize-Winning Scripts from Scholastic Magazines' and AER Contests for 1950

This new collection of student-written radio scripts brings you — in one convenient volume—the prize-winning entries from the Scholastic Magazines' and AER contests. These 12 complete scripts are "essential reading" for both teachers and students who are planning to participate in next year's radio writing contests.

Each script is complete with all necessary sound cues and sound effects instructions — making excellent material for dramatization and recording in the class room or at home.

The prize-winning scripts contained in this 1950 collection are listed below:

SCHOLASTIC MAGAZINES' RADIO SCRIPT WRITING CONTEST

(High School Students)

Original Radio Drama

First Prize — OF SAND AND STARS, by Richard O. Justa

Second Prize — YOUR LOVING SISTER MADELINE, by Ann Keller

Third Prize — IT HAPPENS EVERY DAY, by Pattie Ann Lewis

Fourth Prizes — ESCAPE FROM LIBBY, by Roger Lee Paulson

THE BEST THINGS IN LIFE, by Ronald Wolfe

General Radio Scripts

First Prize — ATOMIC ERA ONE, by Bernard H. Merems

Second Prize — RAISING OF THE DEAD, by Janice Anne Chaskes

Third Prize — THE VOICE OF TOMORROW, by Morton Hytner

Fourth Prize — EXPLORING THE MAYAS, by Barbara Halladay

A. E. R. NATIONAL RADIO SCRIPT CONTEST

(College Students)

Classification No. 5 — Scripts for Home and School Recording

First Prize — THE RUNAWAY CHRISTMAS BUS, by John Suchy

Second Prize — THE LIFE OF WILLIAM BLAKE, by Miss Janaan Noonan

Third Prize — MY LAST DUCHESS, by Robert Lee

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audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 8 | 444 Madison Avenue, N. Y. C. | October-November, 1950

The hot stylus method of disc recording, developed by Columbia Records, Inc., is the result of extensive research to determine the limiting factors affecting the variations in surface noise and frequency response at different groove diameters.

Since hot stylus recording is now being applied by a number of professional recordists — and equipment for its commercial use has been made available by the Fairchild Recording Equipment Corporation — it will be of interest to examine the underlying principles which explain the resulting improvements in recording characteristics.

To go back to some basic fundamentals, it has long been known that disc recording styli involve a compromise between signal-to-noise ratio and frequency response. In 1941 it was shown that as we modify stylus dimensions to cut a smoother groove, with lower background noise, the loss of high frequency response increases — particularly as the cut approaches the inner diameter of the disc, with correspondingly reduced groove velocities.

Although signal-to-noise ratio was identified as a function of the cutting stylus and recording lacquer, the decrease in high-frequency response was originally attributed to the reproducer. In other words, it was considered as a playback loss rather than a recording loss.

One school of thought maintained that reproducer tip radii of .002" to .0025" were too great successfully to trace wavelengths of approximately the same magnitude.

Tests were therefore made by Columbia under carefully controlled conditions, to allocate the frequency response loss as a function of the recording stylus — the recording lacquer — the reproducing stylus and the reproducing head.

Fig. 1 shows a set of curves in which frequency response is plotted as a function of wavelength of recorded waves, for various types of cutting styli and disc coatings. The lower group of curves on the same chart shows the relation between wavelength and groove diameter for various frequencies, at $33\frac{1}{3}$ and 78 rpm. The five different frequency vs. wavelength

(*Continued on Page 2, Col. 1*)

University of Kentucky engineering student, John Curry, at the controls of WBKY's portable Magnecorder, making an on-the-job recording at the Ashland Oil and Refining Company, Cattettsburg, Kentucky.

Employees of the Ashland Oil and Refining Company listen to a playback of the tape recording while WBKY's announcer, Bill Gordon, U. K. Radio Arts major, listens in on the headphones.

Unique Programs by University of Kentucky Record the Pulse Beat of Industrial Activity

"If a tape recorder could only talk!"

This was the way a WBKY engineer characterized one of the University of Kentucky station's Magnecorder units after an especially adventuresome day in the field. This engineer had just completed recording one of the University's "Visiting Kentucky's Industries" broadcasts from a Kentucky coal mine.

Several hundred feet in (and down) the mountain the radio group from WBKY was at a cutting face. First the sound and description of the undercutting machinery was etched on tape. Then came the drilling. Next the powder tube was inserted in the hole, and the electrical discharge wire strung out. Came the recording of the blast (successful only after several trys). Quickly the loading machinery came in and scooped up the coal just shot down.

Now came a difficult part of the program, a recording of a ride on the coal train from the shooting face out to the

(*Continued on Page 5, Col. 2*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 6, NO. 8 OCT.-NOV., 1950

Hot Stylus Recording

(*Continued from Page* 1, *Col.* 1)

curves all have the same general characteristics, but with varying degrees of frequency response loss at the shorter wave lengths, as the cut approaches the center of the record. The optimum condition, with minimum loss of response, was obtained with a wax cutting stylus on a wax disc.

These differences are apparently due to two factors — the shape of the cutting stylus and the cutting characteristics of the recording disc lacquer.

When lacquer-coated discs were first introduced, it was found that the cutting styli which had been used for wax were not suitable, resulting in a noisy cut. Special styli were therefore developed for the lacquer discs, the cutting edges being modified or "dubbed" to include burnishing facets on the leading edges of the cutting point, as shown by the drawing in Fig. 2. The burnishing edges gave a high polish to the side walls of the groove, resulting in extremely quiet cuts. The surface noise, though satisfactorily low, still tended to increase as the groove approached the center of the disc. And since this was true even for an unmodulated groove, it was apparently due to the reduced cutting speed at the smaller diameters.

Columbia's engineers assumed, therefore, that the smoothing action of the burnishing facets on the cutting stylus was the result of heat generated by friction, which tended to "flow" a smooth surface on the cut groove. As cutting speed diminished, so would the amount of heat generated, and the smoothing action as well.

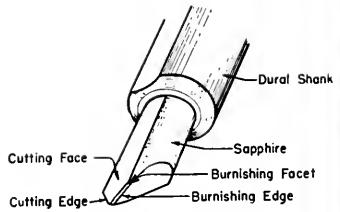


Fig. 2. Enlarged drawing of lacquer cutting stylus, showing burnishing facets which give high polish to groove side walls.

This theory would explain the increase in surface noise. But what about the reduction in high-frequency response?

The shape of the cutting stylus gave an important clue here also. Since wax cutting styli, without burnishing facets, gave less high-frequency loss than lacquer styli, it could be seen that the burnishing facets introduced additional resistance to *lateral* movement of the cutting tool. This would also explain why the response tended to fall off more sharply at reduced groove diameter, too. For, with a fixed frequency, the relative proportion of lateral movement for a given forward travel *increases* as cutting speed decreases with inward travel of the groove. The reduced temperature of the stylus at the slower speeds would tend to increase this resistance to lateral movement still further.

Columbia decided, therefore, to apply the required amount of heat to the stylus by *external* means — making stylus temperature independent of cutting speed. The first method tried, in 1948, was to wind a small coil of wire directly on the sapphire stylus, heating it by means of direct current passed through the coil. This method worked so well that it is still in use today, although many other heating methods were investigated.

As was expected, discs cut with the heated stylus indicated a greatly reduced surface noise — so great, in fact, that it was possible to make remarkably quiet cuts with negligibly small burnishing facets. Fig. 3 shows the results of hot stylus recordings made at various temperatures, for 5 inch and 12 inch diameters. With proper heating current it was possible to obtain remarkably quiet cuts, even at the smallest practicable recording diameters. Moreover, Columbia's tests indicated that hot point recordings would give a frequency response as good as that shown in Curve E, Fig. 1, for wax cutting stylus on wax.

Columbia's development of hot-stylus recording therefore appears to be a prac-

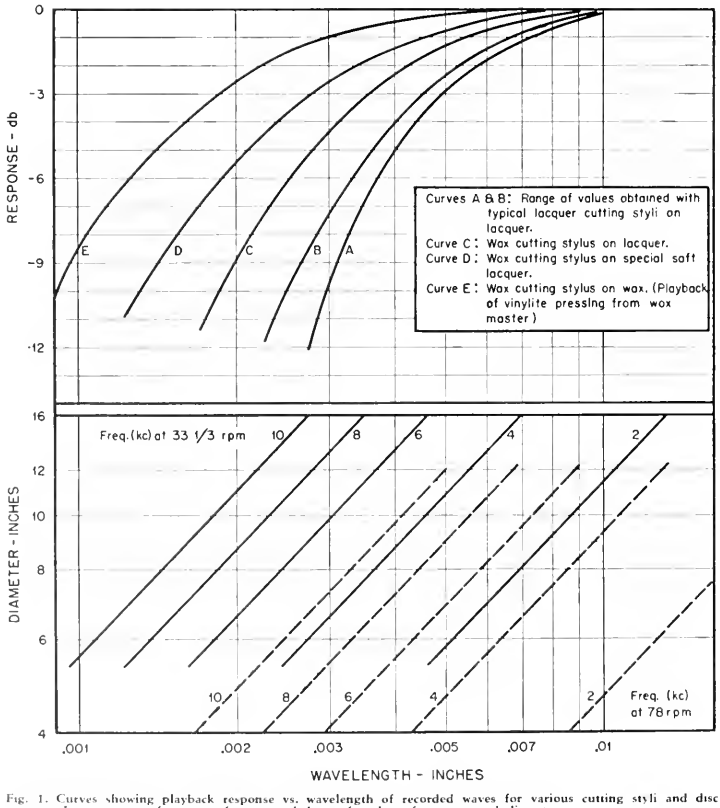


Fig. 1. Curves showing playback response vs. wavelength of recorded waves for various cutting styli and disc coatings. Lower group of curves relates recorded wavelength to frequency and diameter.

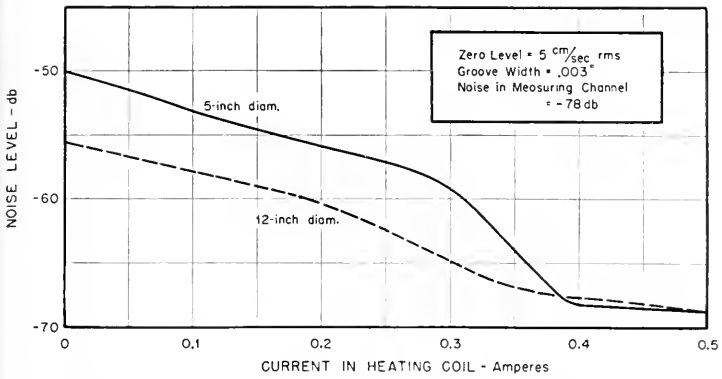


Fig. 3. Curves showing noise level in unmodulated groove vs. current in stylus heating coil. Noise measured with playback channel having uniform velocity response from 500 to 8000 cps.

tical solution to the problems of background noise and frequency response loss. It apparently offers all the advantages of wax recording, without sacrificing the convenience of lacquer discs for direct playback and easy processing.

Perfected equipment for the application of this principle was announced by the Fairchild Recording Equipment Corporation last April. The Fairchild "Thermo-Stylus Kit", illustrated in Fig. 4, includes a cutter-head adapter, two special cutting styli with built-in miniature heating elements (one stylus for standard and the other for microgroove recording), and a thermo-control box, with on-off switch, variable heat control, pilot light, and an illuminated meter, color calibrated to indicate the thermal settings for standard and fine-pitch recording. The control setting is non-critical, as good results are obtainable with a relatively wide latitude of stylus temperature.

It is stated that recording with the Thermo-Stylus method results in a reduction in surface noise of as much as 20 db, and that noise increases with decreasing diameter are negligible. Fig. 5 shows diameter losses in db for both hot and cold recordings at disc diameters of from 16 to 4 inches. Curve for hot point recording is made from disc cut with the Fairchild Thermo-Stylus Kit.

The complete Thermo-Stylus Kit is priced at $100.00. Detailed information can be obtained by writing to the Fairchild Recording Equipment Corporation, 154th St. and 7th Ave., Whitestone, New York.

As is the case with any new development, the real measure of the success and practicability of hot-stylus recording lies in its acceptance and performance "in the field". We will therefore welcome any comments on this subject from those of our readers who have experimented with or are now using the hot stylus recording process. Any information of this nature that we receive will be included in future issues of Audio Record

Audio Fair Draws Record Attendance

The second annual Audio Fair, held at the Hotel New Yorker, New York City, on October 26th, 27th and 28th, proved to be an even bigger success than was anticipated.

Registrations were about *double* those of the first Audio Fair held last year. Although total attendance has not yet been tabulated, the 1950 Fair drew a conservative estimate of 6,500 visitors — which compares to 3,300 for the 1949 event. There were more exhibitors, too — 69 in 1950 compared to 56 last year. And in many cases, one exhibitor included several manufacturing divisions of a company, each with a separate line of products.

As for individual attendance at the Audio Devices exhibit, professional, educational, and amateur recordists alike all evinced keen interest in the large Audiotape display — including the standard 1/4" tape in sizes from 300 to 5000 feet, as well as many larger widths (up to 3 inches), produced for specialized magnetic recording applications. Also displayed for the first time was the new Audiofilm, which is described on page 8 of this issue.

Four hundred and seventy three *new* subscribers asked to be put on the mailing list for Audio Record. And hundreds of free, 300-foot sample reels of Audiotape were distributed to interested recordists.

Many visitors were surprised to see how *extensive* the Audiotape line had grown to be — particularly with reference to the specialized tapes for industrial, research, and communications applications.

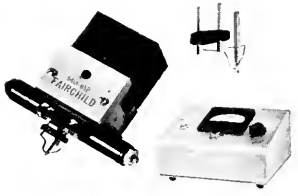


Fig. 4. Fairchild Thermo-Stylus Kit for adapting disc recorders to hot stylus operation. At left, the Thermo-Stylus, with adapter, is shown mounted on a Fairchild Magnetic Cutterhead. An enlarged, close-up view of the Thermo-Stylus is shown at the upper right, above the Thermo-Control box.

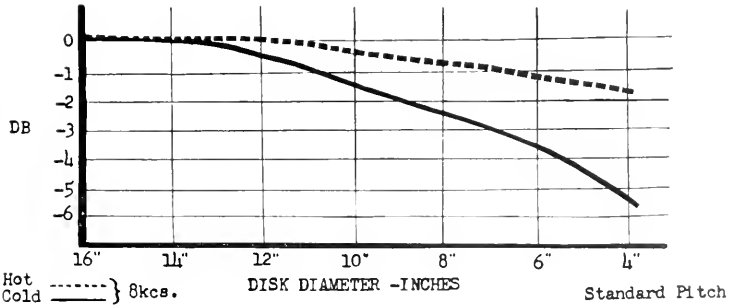


Fig. 5. Curves showing relative frequency-response losses of conventional and Thermo-Stylus recordings at various groove diameters.

by C. J. LeBel, Vice President, Audio Devices, Inc.

THE FIRST AES STANDARD

C. J. LeBel

After two years of work the Audio Engineering Society has just issued its first standard, for a universal disc *reproducing* characteristic. Since this represents the first solution to a problem which has plagued the record ist for many years, we wish to discuss it at length.

Background

An understanding of the background of the problem is helpful in indicating why this particular solution, of the many possible, was chosen.

During the days of acoustical recording there was no standardization — even by a single man. Every recordist had his own personal cutting heads, with one for sopranos, one for tenors, another for baritones, and so on. He would use the head which has personal judgment suggested might be best for a given type of voice — and this judgment changed with time. Reproducing characteristics were similarly varied.

The advent of electrical recording and reproduction made it easier to *measure* recording and reproducing characteristics, but it brought no standardization. By the late thirties the chaos had reached its height in the transcription field, so that a radio station playing five different platters might have to use as many different reproducing characteristics. At this point the National Association of Broadcasters stepped in and set up its Recording and Reproducing Standards Committee. After a great deal of effort a task group headed by R. M. Morris brought forth a standard *recording* characteristic in 1941, an epocal step after the long period of inaction by the organizations which would normally do the job. The war then clamped down on further non-military research.

The end of the war saw quite a change in the equipment situation. Most prewar cutting heads tended to saturate at high frequency and high level, so that at peak levels the full high frequency preemphasis was not recorded. The newest developments did not saturate — they actually recorded the full high-frequency input. Even more distressing, they had good response up to 12 to 15 kc — and the NAB preemphasis curve stopped at 10 kc. The postwar pickups would reproduce up to 15 kc, too.

Conscientious recordists heard signs of distortion at the higher frequencies — a harsh fringe to the tone on peaks. But instead of being momentary, the fringe might persist for ten or fifteen seconds at a time, a very disagreeable effect. A decrease in recorded level was an effective remedy — at the expense of loss of signal to noise ratio. The cause of the difficulty was obviously tracing distortion — the reproducing stylus could not follow the increased high-frequency level of the groove.

Several remedies were adopted. Some decreased recording level, others decreased preemphasis, a few placed part of the preemphasis ahead of the monitor amplifier connection to the recording system, and many found that a change of microphones would help a bit. The latter two changes are technical evasions of the NAB characteristic, taking legitimate advantage of loopholes. But a standard with loopholes is no longer standard; it is just a statement of good intentions. One of the boldest organizations asserted, quite rightfully, that the NAB recording characteristic could be used successfully if conditions were absolutely perfect. It is hard to be infallibly perfect, so production trouble ensued at inconvenient moments.

Meanwhile, in the revivified phonograph record field, mild anarchy raged, with at least four values of crossover frequency and at least five high frequency preemphasis curves in use in twenty possible combinations. Public protest rose angrily.

So, when the Audio Engineering Society Standards Committee began its work two years ago, the first project was that of standardizing the characteristics of transcriptions and phonograph records. The result has been checked carefully and accepted by leading organizations in the field.

Why a Reproducing Characteristic?

The most significant point is that the committee followed the lead of the motion picture industry and standardized on a *reproducing* characteristic. There are many reasons for reproduction being easier to standardize than recording, revolving around the impossible problem of allowing for studio acoustics, microphone characteristics, orchestral balance, and monitor system point of feed. These same problems forced the motion picture recordists to adopt a reproducing standard after failing with the opposite approach.

Salient Points

The standard covers the reproducing system from the stylus to the amplifier electrical output, assuming a loudspeaker with uniform response. It is for use with all types of generally used disc records: 33⅓ and 45 rpm microgroove recordings, transcriptions, and old style 78 rpm records.

While response has been defined out to the modern production limit of 15 kc, it does not debar one from using a narrower range system. Objections to the NAB preemphasis have been met by using a lower value. As a compromise between the 300

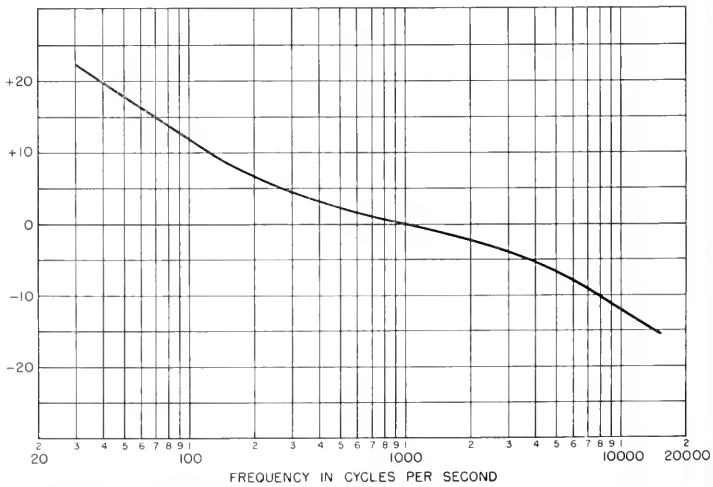


Fig. 1. Audio Engineering Society Standard Playback characteristic for Disc Records. Standard also includes tolerance of ± 2 db not shown on graph.

and 500 cps crossovers which have been in wide American use, 400 cps has been adopted. This is close enough to both 300 and 500 cps so that all three can often be handled at a single equalizer setting. The resulting response curve is of so simple shape that it is easily produced by two RC networks of the most simple form.

The recordist is free to use any recording characteristic he wishes, so long as he makes the result sound good on a standard reproducing system, but most will use a recording characteristic inverse in character to the standard. Reducing the preemphasis, if studio acoustics are bright, may be desirable.

After Thoughts

In time we can expect that a studio engineer will be able to play all discs with a single response characteristic, but this will not occur overnight. Although it fits a great deal of present production, much old material remains in the catalogs, and until the metal parts are scrapped, some discs will be beyond limits.

This is not a lifetime standard. Less preemphasis would be desirable if processing techniques could be improved and noise levels reduced. The last ten years has seen a 10 db reduction in pressing noise levels, and progress will surely not stop at that point. In another 10 years we may see another 5 or 10 db improvement. We may wish to exchange some of this for less peak distortion, by reducing preemphasis another 4 or 5 db. The crossover frequency is much less likely to be changed.

Nevertheless, we should not fret at change. For the first time in history the American disc recording industry has pinned down this most difficult question, and it would be very ungrateful to ask for a lifetime solution in such a rapidly moving field. We should be happy that the Society has achieved so useful an answer.

EDITOR'S NOTE

This combined October-November issue does not mean that we have abandoned the policy of publishing Audio Record on a monthly basis.

Because of the time required to compile the material on the tape recorder supplement in the last issue, this was quite late in getting mailed out. By giving you two issues in one this time, we hope to be able to "catch up" on our monthly schedule.

Kentucky's Industries

(*Continued from Page 1, Col. 3*)

tipple. The new Magnecorder self-contained power supply was called into use for this purpose. It performed a yeoman service and the pick-up was made without a hitch. A six minute scene was recorded at the tipple, and lastly, a spot was made at the new coal treating plant.

Back in Lexington the head engineer of the University of Kentucky's WBKY edited the tape into a thirty minute finished show. Finally it, with twelve other similar shows, was sent to WHAS, Louisville, where the programs were transferred to lacquer discs for broadcasting each Saturday afternoon.

The making of the industrial shows, an idea of Elmer G. Sulzer, director of U. K.'s radio activities, has proven of value to many diverse groups. Students in Mr Sulzer's Department of Radio Arts have acquired professional interviewing, production, and engineering techniques in producing programs from such varied locations. The thirteen selected industries, themselves, have seen a sufficient public relations value in the series to warrant their paying the transportation, board and lodging expenses of the U. K. crew doing the broadcasts. The University, itself, gains in goodwill, not only with the industries involved, but also in its role of serving the state. In fact the University station's call letters — WBKY — mean "We Broadcast Kentucky."

Publicity accruing to the state as a whole because of the industrial broadcasts has caused the state Agricultural and Industrial Development Board to finance the preparation of thirty complete sets of the thirteen programs, and these discs, to be pressed by Muzak, will go to a selected list of Kentucky's radio stations.

Diversity has marked the types of industries included on the schedule, the complete list of which follows:

Railroads
L & N Railroad Company

Newspaper Publishers
Courier Journal and Louisville Times, Louisville, Ky.

Cement Manufacturing
Kosmos Portland Cement Company, Kosmosdale, Ky

Dairy Products
Lexington Dairies, Lexington, Ky.

Cigarette Manufacturing
Brown and Williamson, Louisville, Ky

Record Manufacturing
The Muzak Corporation, Elizabethtown, Ky

Tourist Industries
Kentucky State Department of Highways

Coal Mining
Inland Steel, Wheelwright, Ky

Lumbering
McCracken and McCall, Bell County, Ky.

Oil Refining
Ashland Oil and Refining Company, Leach, Ky.

Thoroughbred Industry
Calumet Farm, Lexington, Ky.

Small Fabrication
The Kawneer Company, Lexington, Ky.

Clothing Manufacturing
Merit Clothing Company, Mayfield Ky.

A number of these programs included scenes from widely separated spots. For example, the L & N show alone included pickups in the freight yards at DeCouresy just south of Cincinnati, a dispatcher's office in Louisville, and a trip on the front end of the "Panamerican" between Cincinnati and Louisville. The Ashland Oil and Refining Company program was opened by a scene on one of that Company's diesel towboats en route up the Ohio River, while the broadcast of the Tourist Industry included "takes" from Lexington, Natural Bridge, "My Old Kentucky Home" at Bardstown, Mammoth Cave, Cumberland Falls, and Kentucky Lake — literally all corners of the State.

Only with the most modern tape and disc equipment could so comprehensive a series of broadcasts be made. But additional plans of a radio nature are in the offing.

In cooperation with the Kentucky Agricultural and Industrial Development Board, a new series of thirty minute tapings by the University of Kentucky's WBKY is in the offing. To be entitled "Community Kentucky" and largely planned by Miss Camille Henderson, U. K.'s program supervisor, each program will be devoted to a Kentucky community that has distinguished itself by its progressive and forward-looking attitude.

And so once more, a trusted U. K. Magnecorder will go forth, this time to invade pottery plants, cooperage works, turkey brooders (ugh), radio tube works, and gas wells.

Kentucky's "Tourist Industry" gets a plug from way down under — with this recording being made in the grand rotunda of Mammoth Cave. Holding stop watch is Elmer K. Sulzer, director of U. K.'s radio activities. Bill Gordon at mike, and John Curry at recorder. Others are park officials.

New Techniques in Educational Recording

by Wesley L. Lewis
Associate Professor
Mt. San Antonio College

When a new college, beginning its fifth year, does something in the way of improving teaching techniques so outstanding as to attract the attention of older, established schools as well as that of several faculty members of the formidable University of California at Los Angeles, news indeed has been made. Yet, this is exactly the news on the Mt. San Antonio College campus near Pomona, California.

The idea of teaching with magnetic tape and with instantaneous disc recording is certainly not new, and Mt. San Antonio makes no claim for originality on that score. However, it does maintain that it is making fresh use of recordings and is perfecting techniques of operation, tailor made for the college's own scheme of things. In short, the tape and the acetate disc have joined the faculties of modern language and English classes, science sections and photography groups, as well as those in the usual speech, radio, dramatics, and music courses.

The physical set up as it now stands consists of three different "sound installations" and a fleet of recording machines circulating at large. The heart of the production end of the recording work is the campus radio section with its group of studios, its control room, and its recording devices. Playback and distribution headquarters, which coordinate the overall program, are located in the college library, together with the audio-visual staff, storage facilities, and a small, nine unit, listening room.

The third functional location is a large listening room located in a separate building in the center of the campus. This room is set up with multiple equipment, individual ear phones, and separate desks. It is placed in charge of a trained adult who controls all operations from a large control board. In this room thirty students may listen at a time, either collectively, or in three groups of ten, or in one group of ten and one of twenty.

Recording equipment consists of six circulating tape recorders in addition to the radio section's standard disc and tape machines.

In operation, allowance is made for individual departmental and teacher differences. However, all the usage is coordinated through the library by means of a flexible agreement with the radio section. In the modern language classes, for instance, the departmental chairman checks out a tape machine for full time use. Then with his teachers, he plans well in advance the day by day lessons. With mimeographed lesson sheets made, the language professors, assisted by certain advanced, qualified students, prepare on the tape pronunciation drills, conversations, reading assignments, vocabulary work, and cultural presentations.

Control table in the "listening room" at Mt. San Antonio College. Built by Mr. Wesley L. Lewis, it includes two tape recorders and two disc recorders, with switching facilities for feeding either tape or disc programs to any or all student listening stations.

An English round-table group listens to the playback of its tape recording, while a French class practices pronunciation at the other end of the room. (Note: the partitions separating the desks are not shown here.)

The finished tape, after much re-doing to get it "just right," is then sent to the radio studios where it is re-recorded on to instantaneous transcriptions. For obvious reasons, the transcriptions have proved more generally useful for this particular function. (Again this gives evidence that tape and disc recordings supplement and complement one another).

Returning the tapes to the language department for re-use, the library next arranges for its staff to play the transcribed discs in the large listening room on designated days at announced hours. These playings, of course, coincide with the class room presentations. On occasion the professors are present in the listening room; however, the students usually arrange for auditions on their own study time.

These sessions have become known as the modern "blab school" since each student, isolated as he is with his own headset and desk, is busy talking (and on occasion singing) aloud — oblivious of all others.

Reports are sent from the listening room by the control manager back to the instructors so that the students may receive credit for the assignments.

Tape machines also are found in constant use in the language class rooms. The teachers here record the students in action and make tests of oral development on an equal plane with that of academic progress. Plans are now being made for the additional use of small disc recorders in the classes in order to create even greater flexibility in this function.

Recent public reports by the Mt. San Antonio language faculty have stated that the student tests have proved the effectiveness of the system. On both a time schedule and a percentage of learning basis, these students have rated higher than others in the previous experience of the instructors.

The application in the English classes is completely different but no less interesting. Lessons in Freshman English combine the usual academic preparations with round-table discussions in which students sharpen tongues and match wits in discourses ranging from politics to literary criticism. The panels are, of course, tape recorded. The instructors make corrections and evaluations of the work from the standpoint of delivery and content. Each student panel later presents itself in the large listening room for the playback of its tape. With their teachers' evaluations before them, the individual students in turn judge the effectiveness of their own presentations.

The comments after these auditions are not unusual. One hears such remarks as, "I don't see how I could have said that, because I didn't mean what my words seemed to say. But there it is!"

Others say, "Is that really me? Do I honestly sound like that? How can you stand to listen to me? How can I improve my voice?"

Some people even remark, "My logic was certainly weak in that discussion. I believed I had thought it through much better than that, but I certainly can see, or hear, where I slipped."

After their first skeptical use of the round-table discussion recordings, both students and teachers express their gratitude that such a teaching technique is used at Mt. San Antonio College.

Many instructors register wonderment when told that a science class uses tape and disc recordings for purposes other than the study of sound recording as such. Yet the science faculty believes in keeping modern scientific facts closely related to the daily news and the world of human activity. Recently an internationally famous scientist-inventor was a guest speaker on the Mt. San Antonio campus. His discussion of the impact of modern scientific development upon the physical and mental aspects of our civilization was recorded. Today a standing "outside" assignment in the physics course is the hearing of that speech. Other discussions are recorded from the air for such correlated "hearing."

Aside from the regular listening room playings for class assignments, all tapes and discs are available to anyone at any regular school hour in the library listening room.

Closely related to the science work is that of the photography department. Student and faculty photographers have become active in the making of sound motion pictures. After the editing of the film is complete, the sound track is rehearsed on tape and finally synchronized with the picture, later to be re-recorded on to the film itself by a Hollywood studio. With such an inexpensive and flexible method of rehearsal and final recording, much of the usual amateur character is removed from the student produced films.

These are by no means the only uses of tape and instantaneous discs in the Mt. San Antonio program. The usual speech, radio, dramatics, and music applications are made for periodic evaluations and for permanent records of past performances. The radio section has found it especially to the advantage of everyone concerned to tape-record college broadcasts in the campus studios at the convenience of musical and dramatic groups, then to send the completed tape to the local release station.

Although Mt. San Antonio's program of audio-teaching is still almost "birth-room" new, it has rapidly proved its value. In the short space of one year, for example, its usage grew to a maximum of 650 student listening hours per week. Every new semester seems to see an ever increasing service the program can render. Slow to join any "new" movement, the more conservative professors are beginning to ask questions and to try small experiments. For example, the remedial English section is now full of rumors about top drawer plans to be released in the near future.

As said before, Mt. San Antonio College does not assume originality for the use of audio-devices in education. However, its carefully planned routine and applications are believed to be new. It has been only through a unique spirit of cooperation of the entire school personnel that the "Learning by Ear" program has been possible. This spirit, which is basic to the growth of any idea, begins at this college with the sympathetic and democratic Board of Trustees which enthusiastically supports matters of sound educational advancement. The administration in turn encourages teacher participation and suggestion.

Audio Again Sponsors Script Contest

Scholastic Magazines' Radio Script Writing Contest for 1951 Sponsored by Audio Devices for Fourth Consecutive Year

High-school students throughout the country are eligible to compete for the valuable cash awards which Audio is offering, as sponsor of Scholastic Magazines Radio Script Writing Contest for 1951.

This contest was first sponsored by Audio Devices in 1947 — for the 1948 contest. Since that time, students and teachers alike have shown ever increasing interest in the contest — and entries have grown steadily in both quantity and quality. All of which indicates that the 1951 contest will probably set an all-time record for wide-spread participation.

High school students can submit scripts in one or more of the following three classifications:

1. Original Radio Drama
2. Radio Drama Adaptation
3. General Radio Script

A total of eight cash prizes will be awarded in *each* of these classifications:

First Prize — $25
Second Prize — $15
Third Prize — $10
Five Fourth Prizes — $5 each

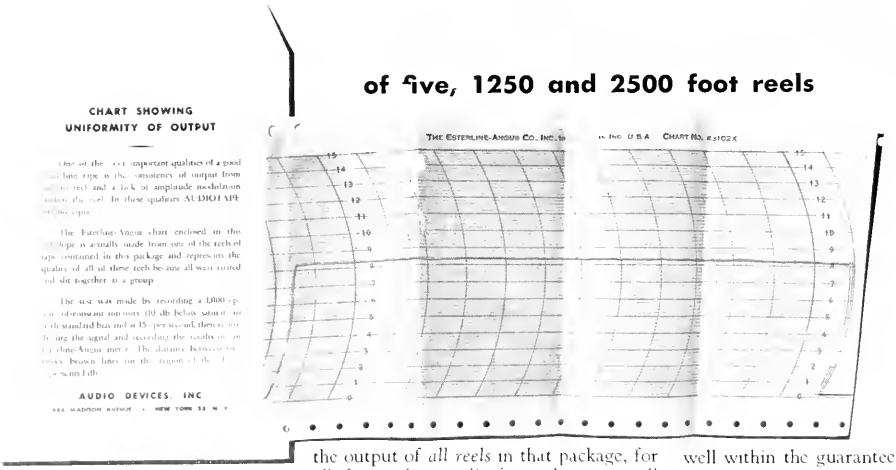
In addition, students whose scripts are selected for publication in "AUDIOSCRIPTS" will receive special awards.

Of still greater importance to the aspiring script writer, however, is the national recognition which this contest affords the winners. In fact it is an excellent stepping stone toward a profitable career in the promising field of radio and TV script writing.

Students and teachers who are planning to participate in the 1951 contest will be particularly interested to know that the prize-winning scripts from the 1950 contest are now available. "AUDIOSCRIPTS 1950", published by Audio Devices for the benefit of future participants, contains twelve complete student-written scripts, selected from prize-winning entries in both the Scholastic Magazines contest (for high school students) and the AER contest (for college students) Copies are available at cost — $1.00 net each. Send check or money order to Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

Two New Audiotape Developments:

of five, 1250 and 2500 foot reels



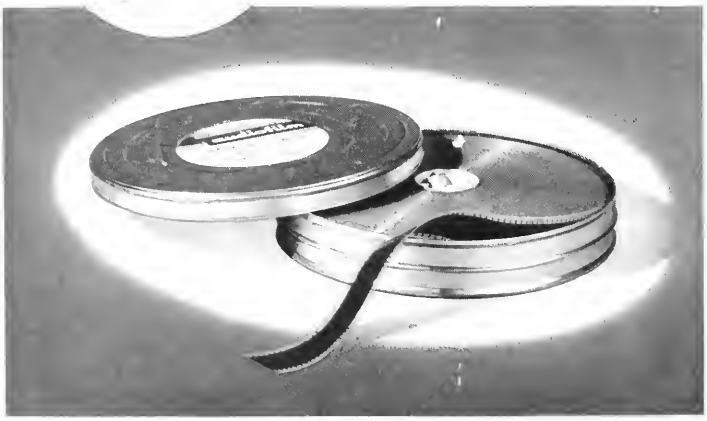
There's no guesswork about the *output uniformity* of Audiotape. For actual output curves, recorded on Esterline Angus Charts, are now included in every package of five 1250-foot and 2500-foot reels, on plastic base.

Each chart — made from one of the reels in each package — actually measures the output of *all reels* in that package, for all five reels are slit from the same roll after coating. This gives positive *visual proof* of the unequalled output uniformity of Audiotape — uniformity made possible by Audio's specially designed coating equipment, which permits accurate control of coating thickness to within *five millionths of an inch.*

This extreme uniformity of output — well within the guaranteed limits of ±¼ db — is also made possible by the fact that all 7-inch reels, as well as 10½ inch reels of plastic base Audiotape, are now *guaranteed* to be entirely *free from splices.*

These two new features are the result of Audio's continuing program of research and development to bring you the finest professional-quality recording tape obtainable.

for motion picture and TV sound recordings



One of the products which aroused a great deal of interest in the Audio Devices exhibit at the recent Audio Fair, was the new Audiotape. This is a standard cellulose acetate, 35-mm, motion picture film — with Audio's red-oxide magnetic coating instead of the usual photographic emulsion. It was developed to offer the motion picture and television industries a magnetic recording medium that could be synchronized with the picture—yet which would offer all the advantages of high fidelity, uniformity and easy editing which are inherent in Audiotape.

The magnetic material is applied to the film (between sprocket holes) by the same type of coating equipment used for Audiotape — assuring the same uniform output, freedom from background noise and distortion, and faithful frequency response over the complete range of audible sounds.

Limited quantities of Audiofilm, produced from a pilot plant, have already been used successfully in the motion picture industry. New plant facilities have just been put into operation to enable this new recording medium to be put into full scale production, in 16, 17½ and 35mm sizes.

*Trade Mark

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 6, No. 9 | 444 Madison Avenue, N. Y. C. | December, 1950

New Multi-Channel Recorders Provide Accurate and Continuous Record of Air-Ground Radio Communications

Stancil-Hoffman multi-channel tape recorder and associated radio equipment in operation at United Airlines Building, LaGuardia Airport, New York City. Mr. L. M. Zell, chief communications engineer, monitors from tape while operator (in foreground) contacts a plane en route to New York from Chicago.

Rear view of tape recorder cabinet with access door open showing compact interior arrangement of components.

It takes a lot of talk to fly a plane. And mighty important talk it is, too. From the time the modern airliner leaves the ground until it reaches its destination, the pilot is in constant radio contact with ground stations along the route. From them he receives weather reports, flight instructions, and possible re routing to avoid local storms. He is kept informed of the movement and altitudes of other planes flying the same "lane". Also, he is required to keep ground stations informed of his position at regular intervals and to report expected time of arrival at the next scheduled terminal. In instrument weather the pilot may depend largely on verbal instructions from the control tower to "talk" the plane down for a safe "blind" landing.

The very nature of these vital communications indicates the desirability of keeping some kind of accurate record for possible future reference. Although this is not required by the FCC, many progressive Airlines have made the recording of all plane-to-ground and ground-to-plane communications a part of their standard procedure. In this application, magnetic tape has been found far superior to any other recording methods heretofore used.

To give a better understanding of this relatively new application, and the highly specialized equipment used, we will consider briefly one of the outstanding installations — as made by United Airlines at their major air terminals throughout the country. The installation at LaGuardia Airport in New York is a typical example.

The Stancil-Hoffman multi-channel communications recorder shown in the accompanying illustrations is used continuously, 24 hours a day, making an accurate and unquestionable record of all plane-to-ground and ground-to-plane messages car-

(*Continued on Page 2, Col. 1*)

Third and Fourth Graders Plan, Prepare, Write and Produce Daily In-School "Radio Programs" . . . at Enterprise School, Decatur, Ill.

Although this sounds like an ambitious enterprise, even for students of high school age, it has already proved to be a practical and stimulating part of the daily routine for third and fourth grade pupils at Enterprise School. In fact, the first and second graders come in for their share of recording activities, too.

This radical departure from traditional teaching methods has been made possible by the modern technique of tape recording — for the tape recorder serves as both the "recording studio" and "broadcasting station". In instituting this program of student "radio shows", the Enterprise School is not attempting to make script writers or sound technicians out of all of their pupils. The real objective is much more fundamental in nature — and the recording work is simply a means to that end. The key words in this new type of primary education are *self-evaluation* and *self-criticism* — as well as self-expression and self-reliance.

Armin H. Beck, of the Enterprise School gives the following account of the work-

(*Continued on Page 4, Col. 1*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 6, NO. 9 DECEMBER, 1950

Aviation Recordings

(*Continued from Page 1, Col. 1*)

ried on three separate radio channels, as follows:

(1) 5572.5 Kc (day) or 3162.5 Kc (night)
(2) 8240 Kc
(3) VHF

The No. 1 channel covers the majority of all routine communications with flights between Chicago and New York.

The No. 2 channel is for standby service, and is used whenever the No. 1 channel is not available for a given message.

The No. 3 channel (VHF) is used within line-of-sight distances from the control center, to provide clearer reception under unfavorable static conditions.

Although the equipment used is capable of recording up to 15 channels simultaneously on Audiotape 0.7" wide, this particular United Airlines' installation uses only three channels at the present time. Additional channels, however, will probably be utilized later. After recording a full 5000-foot reel (4 hours continuous), utilizing the three channels nearest one edge of the tape, the reel is turned around and recorded again, so that the same three-channels record at the opposite edge of the tape. This enables United to store a full 8 hours of recording time on a single reel of tape.

The following simple but foolproof method has been devised for determining whether a reel has been fully recorded (run through twice) or only half recorded (run through once). The two empty reels supplied with the machine are bright aluminum, while the reels supplied with the tape have a brown finish. The aluminum reels are used *on the machine* at all times — never stored. When a full reel of tape (brown reel) is put on the machine, the aluminum reel is used for the take-up at the initial recording, after which it is turned around and moved to the supply-reel position, and a brown reel is used for the take-up during the second recording. A full aluminum reel therefore *always* contains tape that has been recorded only once, and no confusion can result.

Fully recorded reels are kept on file for 15 days. If, during that time, any question should arise as to who said what to whom — the tape provides an infallible and indisputable record. After the 15-day storage period, the reels are individually erased in bulk (or "defrosted" as the airline people call it) and used over again. The "defrosting" unit supplied with the machine permits a fully recorded 5000-foot reel to be completely erased in a few seconds, simply by rotating the reel a few times in a strong alternating magnetic field.

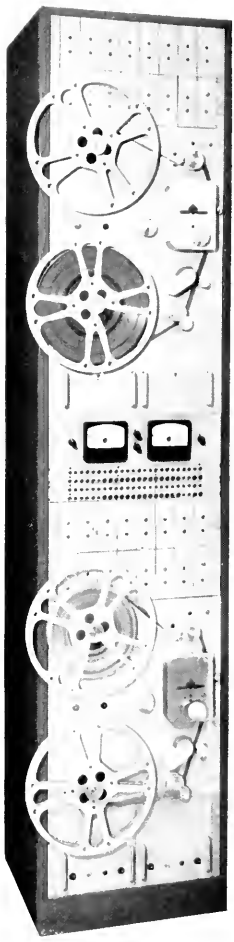
The Stancil-Hoffman Type CRM-15 multiple-channel communications recorder includes two separate record-playback units — timed and synchronized to operate automatically in sequence as follows.

At the beginning of a recording period, the first unit, containing a fresh reel of tape, is automatically started by its timing mechanism, which actuates both the tape motion and the recording circuits. This unit then records continuously for four hours, using a reel containing approximately 5000 feet of 0.7 inch wide, paper-base magnetic tape. At the end of the four-hour period, the time clock on the second unit automatically starts this machine operating.

Meanwhile the first unit continues to run until its tape is exhausted, allowing an overlap of the two recordings of about 25 minutes. When the tape is completely run off the first machine, it automatically stops. At any time during the next four-hour period, the operator may rethread the first unit with a fresh reel of tape, making it ready to take over for the following 4 hour period.

At any time an operator may check the recordings as they are being made on the tape by monitoring directly from the

Marvin Boland, of United Airlines communications department, "defrosts" a 5000 foot reel of 0.7" Audiotape. Tape storage racks shown in background.



Stancil-Hoffman, Type CRM-15 communications recorder, designed for continuous operation with up to 15 simultaneous recording channels.

Close-up view of 5 unit recording head assembly for CRM-15 multiple-channel recorder. Three of these units are used to give full 15-channel capacity.

recorded tracks. The playback head is switched from track to track by means of a rotating knob, which also actuates a numerical indication of the track being played back. It is thus possible to make sure that each track is recording properly while the machine is in operation.

If it is desired to play back a recorded tape from the files, the reel is threaded on the stand-by unit in the normal manner, and run to the desired position by fast forward or rewind. When the section of interest is located, it is played at normal speed and monitored either from the output of the playback amplifier through a power amplifier and speaker, or by means of earphones plugged into the machine at the front panel. During fast forward and rewind, the tape is lifted away from the heads to reduce wear.

The basic recorder includes a 5-unit head assembly which provides for simultaneous recording on 5 different channels. Additional channels up to a total of 15 may be added at any time simply by adding plug-in head assemblies and associated plug-in recording amplifiers.

Performance specifications are as follows:

Frequency response: 200-3500 cycles (±3 db) at 3¾ in/sec. 200-7500 cycles (±3 db) at 7½ in/sec.
Signal-to-noise ratio: at least 40 db.
Distortion: not more than 5% total harmonic at "0" input recording level
Tape Speed: 3¾ or 7½ inches per second.
Input Impedance: 600 ohms balanced
Input Level: 0 db (6 milliwatts)

Additional detailed information on this multi-channel recorder can be obtained by writing to The Stancil-Hoffman Corporation, 1016 N. Highland Avenue, Hollywood 38, California.

What — No Santa Claus?

During 1950, Audio Devices has sent out many thousands of free sample reels of Audiotape — to interested recordists all over the country, and in all fields of recording work.

Recently, however, we received a total of *fourteen* requests for Audiotape samples — all from one high school student.

He got a generous 300-foot free sample, of course. We are sure that it convinced him of the superior qualities of Audiotape — even though it might have been disillusioning with respect to the existence of a real Santa Claus.

CLIPPING

by C. J. LeBel, Vice President, Audio Devices, Inc.

C. J. LeBel

One of the gravest deficiencies of the English language is the fact that a given word has so many different meanings to different people. Compare, for example, the pleasant meaning of "clipping" to the barber, the pugilist, the owner of bonds, the manicurist, and the television designer, with its bad connotation to the audio engineer. For lack of space we will have to limit our discussion to one aspect of its impact on the tape recordist.

The Effect

For some time the writer has noticed a fault common to many phonograph records made from tape originals. They lack expression and punch. Crescendos do not seem to have any force — they are like trying to hammer a feather — they lack solid impact. In a subtle way, the result is very tasteless. The effect seems worst with tape originals done on portable recorders by those new to the field, but it exists also on work of some of the old timers. We may lay much of the blame to the fact that a portable tape recorder looks so easy to run, for even record critics try to operate one! Portable equipment should be viewed with the caution and respect accorded the old portable wax recorder.

The Cause

Beyond a certain point, tape recorder gain drops rapidly and distortion increases without limit, as shown in figure 1. This limiting output occurs at a level producing about 2 or 3% harmonic distortion. Many portable tape recorders have volume indicator sensitivity so adjusted that O VU occurs at a level corresponding to 2% distortion.

Unpleasantly, typical program material peak levels will exceed the meter-indicated level by 10 to 15 db, so when a volume indicator indicates O VU, peaks of much higher level are trying to pass through. If O VU corresponds to the 2% distortion point, these peaks cannot be recorded, for the tape saturates with a result like recording through a wrongly set volume limiter. Machine salesmen have boasted about the limiting effect of overloaded tape without realizing the actual effect on the ear.

The same effect does not occur in transcription disc recording, for the widely used 5 to 7 cm/second nominal recording level provides a 10 db allowance for program peaks if proper preemphasis is used.

The Remedy

The cure for all this is very simple — just use a lower recording level. The most conscientious organizations will use a nominal level of 10 db below the 2% point. Those more concerned with signal to noise ratio than with distortion may drop only 5 or 6 db below. Using a lower recording level means that, in effect, we are trading loss of signal to-noise ratio for reduction of distortion, a good trade only if we have signal-to-noise ratio to spare. The home type machine with a catalogued 40 db ratio drops in actuality to 30 db — too low. Only with a nominal ratio of over 55 db does this level decrease become fully practical.

Good modern unfilled-vinyl pressings seem to achieve a signal to-noise ratio of at least 50 db, so a tape original which is to add no noise to the disc must be rather better than 50 db; this would become well over 60 db at the 2% point. Evidently, a tape recorder for phonograph mastering must be of exceptional quality.

Conclusion

While all that has been discussed is *known* to leading recording organizations, there is need to apply it on a much wider scale, judging from a brief listen to current record production.

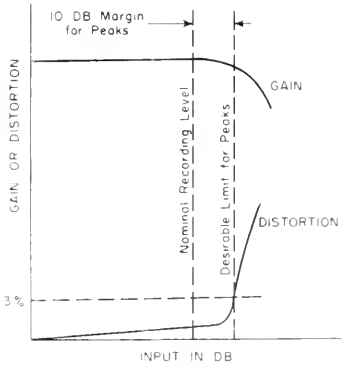


Fig. 1. Gain and distortion characteristics of a magnetic tape recorder.

Radio Workshop

(*Continued from Page 1, Col. 3*)

ing of this interesting and highly instructive program.

"Enterprise School is a two-room school, part of the Decatur School System, with Grades 1 to 4. Third and fourth graders plan, prepare, write and produce daily in-school radio programs. These programs are on a variety of subjects which have been developed by the children themselves, and they maintain a rather high level of interest among the children, particularly because each child is on a show at least once a week, and usually more. Those on the daily shows record the programs on the tape, away from the remainder of the class (usually during recess), and then the recording is played back on the part of our daily schedule known as 'Our Listening Post,'. The class then breaks down into small groups for short buzz sessions, with the leader of each small group joining the other leaders to form a panel discussion. This panel discusses the program from two points of view: what was done well, and what could have been done better. These discussions are also tape recorded for instantaneous playback, with the children themselves engineering the actual recording."

"Last year the children developed into such expressive readers that they were invited by one of the local radio stations, WDZ, to put on a series of weekly plays, which were produced by the children under the name of 'Adventures in Education'. The story was usually adapted from some children's literary classic, such as Aesop's Fables, or Tom Sawyer. The programs were successful, as attested to by local school personnel, fan mail, and WDZ broadcasters."

"Briefly, the improvements noted in the children can be categorized in two ways: social learnings, and academic learnings. By utilizing the motivations inherent in such a learning situation, the children were able to develop respect for constructive criticism and divergent points of view, cooperation, regard for properly constituted authority (they must obey the producer once the show is ready for recording), interest in the welfare and abilities of others, the feeling of belonging and contributing something important, and a willing acceptance of greater responsibility."

"The list of subject-matter improvement, or academic learnings, broken down, is also impressive: reading for content and expression, spelling (in writing their own scripts), oral and written language, science, social studies, handwriting (legible enough so that it can be read easily by others to prevent the possibility of 'dead air'), and an appreciation of music as an integral part of everyday living. These latter are, of course, also the mechanical skills of the traditional school."

This educational recording program, as worked out by the Enterprise School, proves that it is not necessary to have a basic knowledge of radio in order to organize a daily classroom "radio program". Because of the simplicity of modern tape machines, the children can and do make their own recordings, with little or no supervision from the teacher.

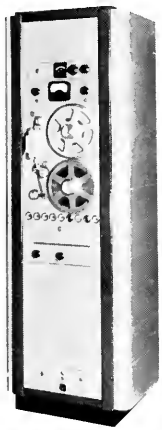
At the request of local school officials, Armin H. Beck has prepared a very comprehensive article on the subject, entitled "Radio Expression in Elementary Schools". Interested teachers may obtain a copy by writing to the Enterprise School, RR8, Decatur, Ill.

Third and fourth graders at Enterprise School, rehearsing one of their daily, in-school radio programs.

Another group of third and fourth grade students recording on tape. Mike stand was made by a fourth grader.

Second, third and fourth graders of Enterprise School broadcasting "The Musicians of Bremen", on Station WDZ, Decatur.

New RCA Recorder



RCA Type RT-11A tape recorder, mounted in cabinet rack and equipped with VU meter panel, tube metering panel and switch and fuse panel.

The RCA Broadcast Equipment Section has recently announced the development of a new, single-track, dual-speed professional tape recorder, designed to meet rigid specifications for broadcast station application.

Features of this Type RT-11A machine include push-button control, timing accuracy of ± 2½ seconds in a 30-minute run, and instant starting and stopping (within 0.1 second). All controls are recessed to avoid interference with tape during threading. The tape is automatically lifted away from the heads during fast forward and rewind, saving wear on heads and tape. Microswitch control automatically stops the machine and applies reel brakes in case of tape breakage. Interlocked solenoid control prevents accidental erasing and makes it impossible to snarl or spill tape during operation.

Although designed for cabinet rack mounting, the RT-11A can be installed in a console type cabinet if desired. Standard equipment includes the tape drive unit, power supply, recording amplifier, reproducing amplifier, panel and shelf assembly, interconnecting cable, and two NAB reels. Accessory equipment includes remote control unit, VU meter panel, tube metering panel, cabinet rack, and switch and fuse panel.

SPECIFICATIONS

Frequency Response: 50-15,000 cycles (± 2 db) at 15"/Sec. 50-5,000 cycles (± 2 db) at 7½"/Sec.
Distortion: Less than 1% at 10 db below maximum recording level
Signal-to-Noise: 60 db below maximum recording level
Wow and Flutter (combined):
0.1% RMS at 15"/Sec.
0.2% RMS at 7½"/Sec.
Rewind Time: 60 seconds for 2400-ft reel
Recording Heads: separate erase, record and reproduce

The standard RT-11A recorder is priced at $1850.00 (less tubes).

For further information write to Broadcast Equipment Section, Radio Corporation of America, Camden, New Jersey.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 7, No. 1 | 444 Modison Avenue, N. Y. C. | January, 1951

Multi-lingual Tape Recorder System Sets New Standards for Efficient Language Study

The use of tape recordings in language work is by no means new. But when the Georgetown University formally opened its new Electronic Language Laboratory last November, it also opened a completely new and ultra-modern chapter in the art of teaching foreign languages. For here, for the first time, is a carefully planned and executed system, designed to take full advantage of the tremendous educational potential of magnetic tape recording, on a University wide basis.

The Electronic Language Laboratory, occupying spacious new quarters in centrally located Poulton Hall, is used by approximately 1200 foreign language students of the University's College of Arts and Sciences and School of Foreign Service—enabling them to master new languages better and faster than ever before.

Basically, the Language Lab is a large-scale sound recording and reproducing studio — functionally designed to permit 120 students to listen simultaneously and in privacy to recorded tapes in any of 6 different languages. There are 120 individual, semi-soundproof booths, with collapsible fronts to permit the use of visual aids (slide films and movies) in conjunction with the language work when desired.

Each booth is equipped with a set of headphones and a six-position IBM language selector switch. This enables each student to listen to any one of six different tape recordings, as specified in his language course. In the privacy of this booth, he can not only listen to verbal language drills, but repeat them aloud, without disturbing the other members of the "class".

The 120 "listening stations" are served by a master control console which contains a total of 12 brush magnetic tape recorders. Six of these are reserved for the use of language students of the School of Foreign Service, and six for those of the College of

(Continued on Page 4, Col. 2)

Master Control Console for Georgetown University's new Electronic Language Laboratory. *Left to right:* Rev. Brian McGrath, dean of the College of Arts and Sciences; Rev. Edmund A. Walsh, regent of the School of Foreign Service; Prof. Leon Dostert, director of the Institute of Language and Linguistics; and Dr. V. Gsovski, professor of Russian.

In individual, semi-soundproof booths, Georgetown language students learn foreign tongues faster by ear — via magnetic tape recordings.

Present Practice Among Leading TV Networks Includes Both Optical and Magnetic Recording

Sound recording in television work involves a number of problems not encountered in radio — hence the methods and equipment used are quite different from those with which the radio engineer is ordinarily familiar.

The use of transcriptions, however, is essentially the same — to permit a given TV program to be broadcast at different hours in the different time zones throughout the country; to permit programs to be broadcast from stations which are not connected to the originating station by coaxial cable; and to provide reference recordings of complete shows, just as they went on the air.

As far as the network stations are concerned, practically all television transcriptions are made while the show is *on the air*. Since most programs require the use of several television cameras simultaneously—any one of which may be switched onto the air at the discretion of the supervising engineer—the most practical way to obtain a visual record of the program *as transmitted* is to copy it photographically from a kinescope picture.

(Continued on Page 2, Col. 1)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 7, NO. 1 JANUARY, 1951

TV Transcriptions

(*Continued from Page 1, Col. 3*)

When a TV transcription is made, it is necessary to record both the picture and the sound, simultaneously and in synchronism. The sound recording part of this process is done in a number of different ways. However, the end result is the same—a 16mm sound moving picture, with the sound on the film in the form of an audio-modulated light track. This video transcription can be rebroadcast by standard equipment in any television station—with high fidelity of reproduction in both picture and sound.

Since a TV transcription requires the recording of sound on photographic film, the problems involved can best be understood if we first review some of the fundamental principles of sound-film projection.

Although the film travels through the projector at a uniform speed (7.2 inches per second), each frame actually *stops* for a fraction of a second as it passes the projection lens. The light is cut off during the interval in which the film is advanced from one frame to the next, resulting in the projection of a series of "still" pictures which the eye translates into smooth, uninterrupted motion. The picture part of the film therefore requires an intermittent motion at the point of projection. The sound track, however, must be reproduced while moving at a constant, uniform speed. This is taken care of in the projector by locating the sound pickup head in advance of the picture pickup, with film slack between the two elements to permit smooth motion for one and intermittent motion for the other. This is illustrated diagrammatically in Fig. 1.

It is obvious, therefore, that the picture

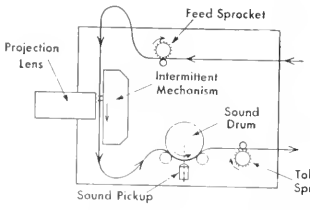


Fig. 1. Schematic diagram of typical sound film projector.

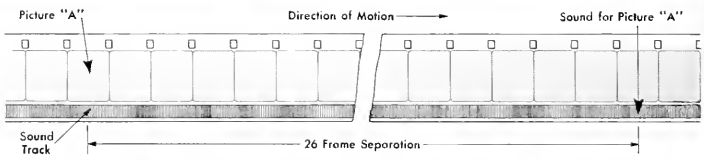


Fig. 2. Diagram showing separation between picture and corresponding sound on 16mm film.

and its corresponding sound can not be located physically adjacent to each other on the sound film. As shown in Fig. 2, the sound "leads" the picture, by a distance equal to the required film spacing between the picture projection aperture and the sound reproducing head. This "lead" distance has been standardized at 26 frames. Because of the displacement between picture and sound, it is impractical to edit completed sound-on film programs by simply cutting and splicing the film. Any provision for editing must, therefore, be made before the program reaches the final sound film print stage.

With these facts in mind, it can be seen that the two basic problems in TV sound recording are: to provide positive synchronization between picture and sound during original recording, and to provide for editing of both sound and picture before the final sound-on film negative is made.

There are two general methods in use today for recording TV sound—the Single System and the Double System.

In the Single System, the sound is optically recorded on the same photographic film as the picture. Synchronization is taken care of automatically because picture and sound are recorded on the same piece of film. This system, however—unless modified in practice—does not permit editing.

In the Double System, the original sound is recorded on a separate medium (magnetic tape, magnetic film, or photographic

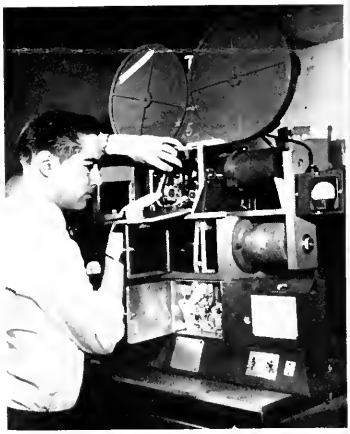


Fig. 4. Engineer Paul Ruckdeschel, of WJZ-TV, threads camera. Note wide separation between camera and optical sound recording unit below.

Fig. 3. One of ABC's kinescope recording rooms at Station WJZ-TV, New York, showing a matched pair of 16mm sound film recording units. Each unit consists of a Wall camera and special Maurer optical recorder mounted on an RCA Kinephoto recording monitor.

Fig. 5. Engineer Edward J. Greene demonstrates operation of Movtola sound film editing equipment, in one of the WJZ-TV editing rooms. Film at left is used for sound track, and at right, for picture. Any parts to be removed are marked on both picture and sound track, to be cut and spliced later.

Fig. 6. Sound recording equipment at NBC television studios, New York, showing a pair of RCA sound on film recorders. Engineer Michael A. Maneale threads 16mm magnetic film into one of the machines. In this double system, sound is recorded separately from the picture, on both magnetic and photographic film.

film), and transferred to the picture film during final processing. This method permits easy editing – for removing any "fluffs" that might have appeared on the program, for altering the total playing time, or for changing commercial spots to provide local interest in different areas.

When the original sound is separately recorded, positive synchronization with the picture is obtained in a number of ways, depending on the medium used. Sound separately recorded on photographic film is synchronized by sprocket holes, spaced the same as the sprocket holes in the picture film. For recording magnetically instead of optically, 16mm magnetic film is available —consisting of a cellulose acetate base having standard sprocket holes, but with a red oxide magnetic coating in place of the photographic emulsion. In addition, standard 1/4-inch magnetic tape can be used, with special recording equipment designed to provide "sprocketless synchronization" by means of timing pulses recorded on the tape along with the sound. Rangertone, Inc., of Newark, New Jersey, has developed a line of sprocketless synchronous magnetic tape recorders, in which magnetic pulses of the 60-cycle power driving the camera are recorded on the tape at magnetic right angles to the sound. This enables the projector and tape to be "locked" in step, regardless of tape stretch or possible fluctuations in the power supply frequency.

All of the above methods are in use today in the various TV stations and networks.

The ABC network, for example, uses a modified Single System method of kinescope photography which gives essentially the same flexibility for editing as the Double System. Although the sound is optically recorded directly on the same film as the picture, *two* copies are made of each show – resulting in an original, and a "safety". If any editing is required, one copy is treated as the *sound* print and the other as the *picture* print. Each can then be cut and spliced as required, and the two combined again in a single print at the film processing laboratory. The ABC system has also been modified to permit recording with higher fidelity than is ordinarily obtained with Single System recording. This has been achieved by special design of the video and audio recording apparatus involving an 88 or 100 frame separation between picture and sound. This, of course, is reconverted to the standard 26 frame separation during final processing.

Fig. 7. This kinescope camera—one of a bank of similar machines at NBC—records the picture separately on 16mm photographic film. Duplicate films are made of every recorded show.

A typical example of the double system is that used by NBC. Here the kinescope picture is copied on 16mm motion picture film, without sound track. At the same time, the sound is recorded both optically and magnetically on separate equipment. The optical recording is made on standard 16mm photographic film, and the magnetic recording on magnetically coated 16mm film. In general practice, the optical sound recording is considered as the "master", and the magnetic recording as the "safety". If, after development, it is found that the photographic sound track is satisfactory and requires little editing, it is transferred to the final 16mm sound picture film, and the magnetic recording is erased so that the magnetic film can be used over again. However, if the optical sound print is unsatisfactory for any reason, the magnetic recording is used as the master, and is re-recorded onto a new photographic negative. This set up, as used at NBC, is completely flexible, and may be varied to meet specific recording requirements. Since the RCA film sound recorders used are equipped with both optical and magnetic heads, either medium may be used interchangeably as desired. In cases where exceptionally high fidelity is required, both the "master" and the "safety" sound recording is made on magnetic film and the sound is played back on a magnetic film phonograph operating synchronously with the TV film projector.

Equipment currently in use by the other major TV networks is, in general, similar to one of the two systems described above. In addition to magnetic film recording, however, standard 1/4-inch magnetic tape, with sprocketless sychronization, is also used in Double System recording. Tape re

(*Continued on Page 4, Col. 1*)

Fig. 8. R. M. Fraser, of NBC engineering laboratory, checks a recording on a modified Moviola editing machine, equipped with a magnetic head for playback of the 16mm magnetic film *(at left)*. Picture print is on right hand reel.

TV Transcriptions

(*Continued from Page 3, Col. 3*)

corders for this application are supplied by both the Fairchild Recording Equipment Corporation and Rangertone, Inc.

The use of magnetic recording in television work is still relatively new. And although this application is growing rapidly, on the basis of presently available materials and equipment, TV and recording engineers are confident that the future will bring great improvements in the magnetic recording of synchronized sound and pictures. One significant avenue of research in this direction is the development of "striped film" — that is, photographic film with a narrow strip of magnetic coating where the sound track would normally be located. This system, when perfected, would permit recording the picture and magnetic sound track on the same film, simultaneously. A film of this type, however, requires a magnetic coating which will be impervious to the developing and fixing solutions used, and which will not be altered either physically or magnetically, during photographic processing. Since the normal 16mm film speed is 7.2 inches per second (remarkably close to the 7.5 inch standard tape speed) high fidelity of magnetic recording directly on the film appears entirely feasible.

Eventually, it may even be possible to record both the sound *and the picture* magnetically. Since a TV picture is actually a series of extremely high-speed electrical impulses, this concept is not as fantastic as it might seem. Such impulses could, theoretically, be recorded on magnetic tape. However, means will first have to be developed to avoid having to run the tape at fantastically high speeds in order to give the necessary split-second timing between signals. Since most of the consecutive impulses are duplicates of the preceding ones, it may be possible to work out a system in which it is only necessary to record the *variations* in consecutive patterns, in which case magnetic picture recording might be possible with reasonable tape speeds.

In any event, it can safely be assumed that magnetic recording will play an ever increasing role in the television field. And — as in radio — television engineers can look with confidence to Audio Devices for magnetic recording materials that will meet the highest standards of quality and uniformity.

WANTED: Stories about your recording activities, for Audio Record — which is read by more than 14,000 sound recording enthusiasts. Please address your contributions to: Editor, Audio Record, 444 Madison Avenue, New York 22, N. Y.

Georgetown University

(*Continued from Page 1, Col. 1*)

Arts and Sciences. Each of the machines may play a different language, all at one time, or more than one may play the same language at different levels of instruction.

The 120 booths are wired into three sections of 40 booths each, permitting considerable flexibility in transmitting language drills from the master console. For example, elementary French may be played on Channel 1 in Section 1 (the first 40 booths), and intermediate French can be played on the same Channel 1 in Section 2 (the next 40 booths) and Section 3 (the remaining 40 booths). Laboratory drills are scheduled at regular hours for the various language classes, and are conducted on a group basis, each group having a block of seats assigned to it during three given periods per week.

The tapes are so prepared as to give the student the opportunity to repeat the words and sentences recorded and to formulate replies to questions based on the recorded text.

The laboratory is equipped with a public address system of five loud speakers. A lecture can be recorded at the time it is delivered and thus remain available for future use.

The whole concept of laboratory drill work in language study is based on the fact that magnetic tape recording permits the reproduction and dissemination of the *spoken* form of language, just as the printing press has heretofore been the means for dissemination of the *written* form of language. The objective is to achieve a practical program which lies between the traditional three-hour-per-week language course and the intensive, wartime-developed instruction.

The use of recorded language drills, especially prepared by the faculty to synchronize with the work done in the classroom, affords the students an opportunity for intensive repetitive drills not possible in the classroom. In broad terms, the "speaking" possibility offered by laboratory drills represents a total of some 50 hours, during the school year, as contrasted to less than 5 hours per school year in the classroom. In other words, the student is able to speak the foreign language in the laboratory for from 15 to 20 minutes during each period, whereas he can speak for only one minute during a given class instruction period.

The facilities of this laboratory will permit approximately 3600 student contact hours per week, or a total of 108,000 student contact hours during the academic year of 30 weeks. To make possible the same amount of language contact drill through individual instructors would require the addition of 15 members to the present language faculty.

The Electronic Language Laboratory was designed by Professor Leon Dostert, Director of the University's Institute of Languages and Linguistics. It is the outgrowth of a somewhat similar tape recorder system which was introduced by Professor Dostert at the Institute several months previously. The earlier system, which is on a considerably smaller scale, has individual tape recorders in each of the student listening booths, instead of in a master control console. Professor Dostert, who is responsible for the development of both of these "language laboratories", is one of the country's leading figures in language work. During the last war, he served as interpreter for General Eisenhower—later becoming liaison officer to General Giraud. Also, it was Professor Dostert who developed the first simultaneous translation system, used at the famous Nuremburg trials. This same Dostert system was later introduced into the United Nations, where it has proved to be of inestimable value.

The editor of Audio Record had the pleasure of being present at the official opening of the new Electronic Language Laboratory at Georgetown University. It is his firm belief that this radical departure from traditional teaching methods is one which other institutions of learning will do well to watch carefully. For this unique tape-recorder installation has set a pattern that is likely to have far-reaching effect throughout the entire educational field.

STANDARDS FOR EDUCATIONAL RECORDING MACHINES

by C. J. LeBel, Vice President, Audio Devices, Inc.

The past three years have seen about 35 new types of magnetic recorders offered for school use. Some are well suited to educational needs, but many have only limited application in the class room. Educators therefore realize the need for establishing some basic minimum performance standards to serve as a guide in selecting the correct equipment.

This subject was thoroughly discussed in an article by C. J. LeBel, which appeared in a recent issue of The Quarterly Journal of Speech. Reprints of this article are now available. If you are interested in educational recording, we will be glad to send you a copy—without obligation, of course. Write to Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

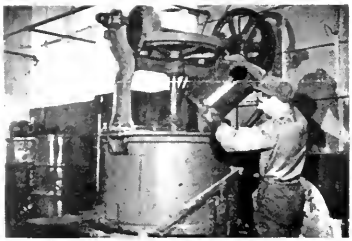
Vol. 7, No. 2 | 444 Madison Avenue, N. Y. C. | February, 1951

Have you ever stopped to wonder *how* Audiotape is made? If you visualize the process in its simplest terms, you may think it's just a matter of applying a magnetic coating to a suitable base material. Yet that's only *part* of the story. For the manufacture of Audiotape actually involves more care and precision than practically any other product that is made today. It's a fascinating story—and one of great interest to all users of magnetic recording tape.

The story of Audiotape has now been told on film—in a new, full color, 16mm sound moving picture. This film, entitled "Audiotape Speaks for Itself," takes you on a personally guided tour through the modern plant where Audiotape is made. You see actual laboratory demonstrations of how the magnetic oxide is formed—dried—ground—mixed—and applied to test samples on miniature, pilot plant equipment. After the test samples are carefully checked for physical and magnetic properties, the ingredients tested are released for

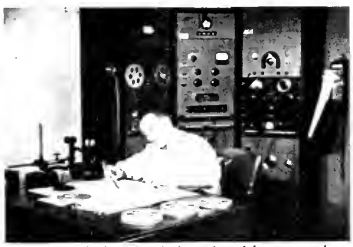
(*Continued on Page 2, Col. 1*)

Laboratory demonstration showing precipitation of magnetic oxide used in Audiotape coating.

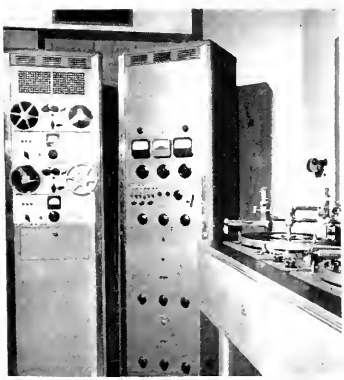


Batch mixing of magnetic oxide and binder preparatory to ball milling.

Part of the slitting room, where the large coated rolls are slit to the required width and wound on reels or hubs.



A section of the electrical testing laboratory where finished tapes from every batch must measure up to the highest standards of performance.



The "business end" of WMBI's sound recording room, showing rack mounted Magnecorder tape machines, audio amplifier equipment and two Presto disc recorders.

by Lorna Lee Macfarlane
Moody Bible Institute
Chicago, Illinois

Radio Station WMBI—owned and operated by the Moody Bible Institute in Chicago—enjoys the unique distinction of having been on the air for a quarter of a century, with never a paid advertisement. From the time it first went officially on the air, with a 500 watt AM transmitter in 1926, the Institute station has been run completely by the gifts of friends. The ensuing 25 years have seen much expansion in the radio department, and today the Moody Bible Institute operates both a 5 kw AM and a 46 kw FM station.

Throughout the eventful quarter century of WMBI's history, sound recordings have played an ever increasing role in producing effective program material. In its early days, the station had two portable disc recorders, then a dual recorder in the control room, and after that a separate recording room. Now they are using Presto Type 6N recorders with Presto Model 88 recording amplifiers. The continuous recording set-up includes facilities for cutting separate programs simultaneously, and this has proved to be a big boon in the preparation of recorded program material. Through the use of high fidelity recordings, WMBI is able to originate broadcasts of the highest quality.

(*Continued on Page 2, Col. 2*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 7, NO. 2 FEBRUARY, 1951

Audiotape Moving Picture

(*Continued from Page 1, Col. 1*)

production use. Then you are taken out into the plant itself, to see Audiotape actually being made—batch mixing, ball milling, coating, monitoring, slitting, production testing, and packaging for shipment.

We believe that this new film will give a much better understanding of *how* and *why* Audiotape has achieved the recognized superiority that has made it the first choice of so many professional recordists. It shows how the extra care and precision in formulating and applying the coating produces a magnetic recording tape that is unequalled in fidelity of reproduction and uniformity of output.

The new 20-minute film, "Audiotape Speaks for Itself," was produced by John S. Martin, of "JM Productions." Photographed in Commercial Kodachrome, it reproduces with sparkling, life-like, full color realism. Sound reproduction, too, is of the finest quality obtainable, with the original recording made on Audiotape. Prints of this 16mm sound film will be loaned without charge to interested recordists and educational institutions. Requests should be mailed to Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

Microscopic examination of production sample of Audiotape—checking for particle size, uniformity of dispersion and freedom from "clumping".

Part of the Audiotape packaging department, where reels are boxed and packed in cartons, together with actual Esterline Angus output curves of one of the five reels in each package.

Moody Bible Institute

(*Continued from Page 1, Col. 3*)

One of the full-time jobs at WMBI is making tape recordings. Using Audiotape exclusively in portable equipment, five or six programs are recorded and presented each week. WMBI also uses battery-operated portable tape recording equipment for on-the-spot interviews and descriptions in unusual places. This helps beautifully on the special events news program. Whenever something exciting or out of the ordinary occurs, the tape man hustles out for an on-the-spot description. During a recent eclipse of the moon, a program was recorded at Chicago's well known Adler planetarium, including an interview with Adler's assistant director.

On another occasion, Chicagoans not only read in their local papers of an exciting 4-alarm fire, but by tuning in WMBI heard a true-to-life tape recording of the milling crowds and an at-the-scene description of the thrilling rescues. Another popular taped program is "Your City and Mine," a public service feature.

Of course, these aren't the only uses for tape. Dr. Irwin A. Moon, director of Moody Institute of Science, recently flew to Mexico and South America to take colored movies of tribal customs and practices. This modern method gives Christians here at home a better understanding of what the missionary faces in reaching these primitive people. Shots of a tribal dance of the Shipibo Indians in the Peruvian jungles were made even more realistic in "To Every Creature," the Moody film, by the actual tribal music taped on-the-spot.

Battery operated recorders are also being used in far-away mission fields where missionaries describe their immediate surroundings and the types of problems they face. Friends and relatives in scattered areas, later tuning in on WMBI, have the special treat of listening to loved ones' voices that were taped thousands of miles away.

The Institute has an amateur radio club operated by WMBI technicians, faculty members and students of the Missionary Technical Course. The "ham" station, W9LLW, is used to converse directly with Moody alumni and other missionaries on the foreign field. Since Institute graduates like to hear news about their alma mater, Dr. William Culbertson, Institute President, and others have taped words of greeting and news that can be played to missionaries on the field when contacted.

The tape habit has spread from the top floor radio studios down to "faculty row" and into the classrooms. Aspiring speech students and those in Bible story telling class check up on mispronounced words, too slow or rapid spacing, and monotony of pitch, and notice (and henceforth eliminate) those pesky "ah's" that have a habit of cropping up. Teachers can decide by playback whether or not their voices lull to sleep rather than provoke attention or interest. Music students catch that flat A and note whether they need more warmth and expression in their singing or playing.

All in all, discs and tape (Audio, of course) have proved friends indeed at Moody Bible Institute, both in radio and class room efforts—a friendship that will no doubt increase as time goes on.

More About Hot Stylus Recording

So far there has been only one serious repercussion to the article on Hot Stylus Recording which appeared in our October-November issue. That was in reference to the assumption that a stylus with burnishing facets offered higher resistance to lateral movement than a wax-cutting stylus which does not have such facets.

Mr. William S. Bachman, Director of Engineering and Development, Columbia Records, Inc., does not feel that this assumption is warranted—particularly when applied as an explanation of decreasing high frequency response at the smaller groove diameters.

We quote from Mr Bachman's letter as follows:

"In the second paragraph of the third column on page 2, it is stated 'that the burnishing facets introduced additional resistance to lateral movement of the cutting tool.' I am not at all sure that there is any truth in this statement."

"It is further stated that 'this would also explain why the response tended to fall off more sharply at reduced groove diameter.' In my paper (Audio Engineering, June, 1950) I pointed out that 'to get good data, therefore, it was necessary to use a cutter having high mechanical impedance or to monitor the motion of the recording stylus by means of an FM calibrator or the equivalent.' Having thereby established that the cutting stylus was executing the required displacement, the effect of the presumed 'additional resistance to lateral movement of the cutting tool' is avoided. Other workers also have reported a loss of high frequencies at reduced diameters, determined optically as well as by playback, even though the motion of the cutting stylus was consistently maintained."

Since Mr. Bachman is one of the Country's leading authorities on hot stylus recording, we are very glad to have his views on this subject, and to pass them along to you. Also, we will welcome any other comments from our professional readers on this or any other subject discussed in Audio Record.

by C. J. LeBel, Vice President, Audio Devices, Inc.

FOR EDUCATORS ONLY

C. J. LeBel

We hate to desert our engineer friends, even for a month, but this article is pointed straight at teachers using magnetic recorders. There is no justification for an engineer reading this item, and we apologetically suggest that he keep it in the top desk drawer for the next time his teacher friends come to visit.

In starting, we might recall the axiom that no piece of equipment lasts forever; in fact its useful life will be very considerably less than forever if proper maintenance attention is not given regularly. The car owner knows that it must be serviced every 500, 1,000, or 2,000 miles, and the musician (as R. D. Darrell has pointed out) has a guilty feeling if his piano is not tuned regularly. But put either in school and give him a tape recorder, and there is no thought of maintenance till the machine fails completely. Years ago schools ran on the theory that only pencils, chalk, and erasers wore out, but times have changed. The advent of audio-visual aids, public address systems, broadcasting, and the audiometer have enforced some concessions to technological change, but not enough. The average Board of Education still wants to see the newest technical improvements in use, without ever realizing the need for the regular maintenance that is the cornerstone of modern technology.

In a busy modern school the tape recorder is in use for four to eight hours at a time, as long as the average radio station's period of use. The professional user will check his equipment quantitatively at least once a day, for bitter experience has taught him that a machine which still emits sounds is not necessarily useful. Is the teacher doing a job which calls for such precision of result? In many cases, his requirements equal those of the radio station's studio equipment, and in the remaining instances he is working at a level close to that reached by the station's portable equipment!

Types of Maintenance

The work herein considered is *preventive* maintenance, catching a fault before it has become bad enough to stop operation. In some cases, the remedy is within reach of the school's ability—like putting in a new tube—but in other cases a factory overhaul is suggested, to be accomplished during a vacation period.

The most common maintenance is of a mechanical nature, such as:

1. Cleaning of heads every 5 or 10 hours of use.
2. Checking of tape tension every 10 or 20 hours of use if friction clutches tend to change in adjustment.
3. Lubrication as prescribed by the manufacturer.

Electronic maintenance should start with quantitative measurement of performance, for the serviceman's check of operating voltages is a very poor index to quality of result. These measurements should be made:

1. Frequency response
2. Distortion
3. Signal to noise ratio
4. Head alignment

From this data one can appraise the need for head alignment, tube replacement, etc.

Who Should Execute Mechanical Maintenance

The mechanical maintenance listed is very simple, and thoroughly within the reach of the average person. One who has polished a silver spoon, used a postal scale, and lubricated a sewing machine would find head cleaning, tension-checking, and lubrication simple. If your fingers are all thumbs, then the large elementary school generally has a science or shop teacher who likes machinery. In the large high school the physics department has a laboratory assistant who is very adept at equipment maintenance, and the large system generally has an instrument maintenance man. If you are in a 200 pupil school, on the other hand, you just have to master the technological world yourself. This is still a simpler world than the old one where a knowledge of Latin outranked the ability to use a screwdriver.

Electronic Maintenance

Measurement of electronic performance calls for the use of an audio oscillator, a gain set, and a distortion and noise meter. The lab assistant and the instrument repair man can handle equipment of this sort with very little instruction, but the private music teacher and the small school have neither available.

Hence, they have to rely on outside assistance, and several alternatives are available. First, try your local radio parts jobber—the source of your discs and tape. If he does not have a service department, he should be able to put you in touch with a qualified man. If this proves inconvenient, try the nearest recording studio or radio station. It is sure to have at least one man who is, de facto or de jure, the audio equipment specialist. He may have the title of audio facilities engineer, studio maintenance supervisor, or chief engineer, or he may merely be the owner. You will have to fit your needs into his time schedule, of course. If it is a well run radio station or studio, then oscillator, gain set, and distortion meter will always be at hand and ready for use.

As a last resort, try to find a radio service man who has made a specialty or a hobby of recording. While his electronic knowledge will be good, in too many cases it will not be supplemented by adequate test equipment. Nevertheless, he is much better than no maintenance at all.

Repairs

Some repairs can be made by your maintenance man. For example, many professional machines have plug-in heads, and a worn head is easily replaced. Distortion in a home type machine is often caused by inadequate bias, and changing an oscillator tube is very simple. For more complex problems the manufacturer's repair department is always available.

Conclusion

With war conditions and material shortages approaching, it becomes even more necessary to prevent little faults from developing into major breakdowns. A good schedule of preventive maintenance will be excellent insurance against this.

REFERENCE

1. C. J. LeBel, Standards for Educational Recording Machines, Quarterly Journal of Speech, Vol. 36 No. 4, pp. 520-523, December 1950. Reprints of this are available.

New Audiotape Movie To Be Shown at IRE Exhibit

The Audio Devices booth at the IRE Show this year will be even more interesting than usual. For, in addition to a complete and up-to-the-minute display of Audiodiscs, Audiotape, Audiofilm, and Audiopoints, there will be a private, soundproof studio where the new Audiotape moving picture will be shown. There you can rest your weary feet and enjoy a 20-minute "trip" through the Audiotape plant—at the first public showing of the new, full-color sound film, "Audiotape Speaks for Itself."

Be sure to look us up at the IRE Show, Grand Central Palace, New York City, March 19-22. We'll be in Theatre No. 316.

Audiodisc Recoating Service Conserves Aluminum and Offers Substantial Savings to Disc Users

As most of our readers know, the National Production Authority has issued orders restricting the use of aluminum for civilian use. Needless to say, these restrictions will be felt throughout the recording industry, since aluminum is the base material from which all instantaneous lacquer-coated recording discs are made.

In order to conserve the supply of aluminum available for this purpose, Audio Devices has instituted a new Recoating Service which will enable many professional recordists to obtain a large share of their disc requirements without using any additional aluminum whatever. Old used discs which are no longer of any value can be sent to the Audio plant where they will be recoated and returned to the sender *as good as new*. The discs are at all times the property of the customer.

When the old discs are received at the factory, the lacquer is completely stripped off, and the aluminum base is coated in exactly the same manner as in the manufacture of new Audiodiscs. As far as recording characteristics are concerned, you therefore get a completely "new" disc—made from your own aluminum base. Yet the cost of recoating offers substantial savings over the cost of new discs. For example, 16" Red Label Discs can be recoated at a saving of 20 cents per disc.

The discs returned need not be of the same "label" desired after recoating. For example, yellow label Audiodiscs can be returned for recoating as red label Audiodiscs, or vice versa. Audio Devices will accept for recoating all makes of professional recording discs on aluminum base in the sizes indicated in the following tabulation:

Disc Size	*Type*
10"	Red Label
	Yellow Label
12"	Red Label
	Yellow Label
	Single Face Red Label
	Reference Label
16"	Red Label
	Yellow Label
	Single Face Red Label
	Reference Label
	MASTERS
12"	Double Sided
	Single Face
13¼"	Double Sided
	Single Face
17¼"	Double Sided
	Single Face

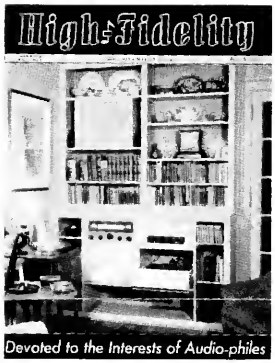
All transactions involving the recoating of discs should be handled through your regular Audiodisc distributor. In shipping the discs to the factory, the distributor will specify the "label" of discs desired of recoating — i.e., Masters, red label, yellow label, single face, or reference, as desired by the customer. We will make every effort to return the discs to the distributor in the types requested. It should be understood, however, that there may be times when we cannot recoat all discs in exactly the types requested. Particularly, we cannot guarantee "reference label" discs except in small percentage of the total discs recoated. Also, we cannot accept for recoating any processed masters which have metal adhering to the aluminum.

If you have a supply of old discs that you would like to put back into use, we suggest that you see your Audiodisc distributor at once and arrange to take advantage of the savings offered by the new Recoating Service.

A new 20-page booklet, published by the RCA Victor Division of Radio Corporation of America, contains a wealth of valuable information on disc recording equipment and methods—with particular emphasis on modern fine groove techniques. It describes in detail RCA's latest professional recording equipment and explains its operation with both conventional and fine groove recording. In so doing, however, it goes far beyond the usual manufacturer's equipment bulletin and takes on an aspect more closely equivalent to an authoritative text book on disc recording science.

Profusely illustrated with photographs, charts and diagrams, this new booklet should be a welcome addition to the reference files of professional recordists—from the standpoint of both equipment details and engineering data on modern disc recording methods.

The booklet (Form 2J-6895), entitled "AM, FM and Television Professional Recording Equipment," is offered free of charge to all interested recordists in these fields. A copy can be obtained by writing, on your company letterhead, to Dep't. 552, RCA Engineering Products, Camden 2, New Jersey.



New "High-Fidelity" Magazine Will Fill Long Felt Need for the Connoisseur of Fine Recorded Music

Audiophiles are people who enjoy the entertainment produced by truly fine audio reproduction. Usually, they are not content with ordinary commercial radios and phonographs. Most of them have—or *want* to have—special facilities for really *high-fidelity* sound reproduction. They are collectors of fine recorded music—many of them make their own recordings, too.

Heretofore, the Audio-phile has had no competent, authoritative publication which would answer his questions — solve his problems—help him to get the most out of the fascinating science of sound recording and reproduction. Realizing the growing interest in this field, Milton B. Sleeper, publisher of "FM-TV" Magazine, has decided to bring out a new quarterly publication devoted exclusively to the interests of all Audio-philes. This magazine, entitled "High-Fidelity," is not an engineering or trade paper. It is strictly for audio enthusiasts—technically trained or otherwise. It is 8¾ by 11½ in. in size, profusely illustrated, and filled with new ideas and information available from no other source.

The publisher is now accepting Charter Subscriptions at the following special reduced rates:

$3.00 for one year (Saves $1.00)
$6.00 for three years (Saves $6.00)
(Prices 50¢ per year higher in Canada, $1.00 foreign). The first issue will be out April 15th.

If you wish to be among the Charter Subscribers to this new publication, send your request, with remittance, to:

Mr. Charles Fowler, Editor
HIH-FIDELITY, Dept. R.
Savings Bank Building
Great Barrington, Mass.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 7, No. 3 | 444 Madison Avenue, N. Y. C. | March, 1951

Not a "Substitute", but a Finer Quality Instantaneous Recording Disc that is Available for Unlimited Use

It has been known for some time that government restrictions on the civilian use of aluminum would force a sharp curtailment in the production of recording discs, unless another satisfactory base material were used to augment the supply of aluminum base discs. The aluminum shortage has not yet become so critical that record ists have been seriously handicapped through inability to obtain needed discs. However, the handwriting on the wall is quite clear, and since it has always been Audio's policy to *anticipate* the needs of the recording industry, glass base Audiodiscs are already being produced in ample quantity to compensate for the curtailed production of aluminum-base discs.

As most of our readers know, glass is not a *new* base material for recording disc manufacture. During the last war, many millions of glass-base Audiodiscs were produced and used with outstanding success. In fact this experience has definitely proved that the glass base disc is, in some respects, actually *superior* to the aluminum base disc.

The most significant improvement is the extreme smoothness of the surface. It has been demonstrated by precise measurements that the glass surface is far flatter and smoother than the finest aluminum base which it is possible to produce.

This is clearly shown by the comparative surface characteristics curves in Fig. 1 and Fig. 2. As a still further basis of comparison, Fig. 3 shows the surface characteristics of the finest rolled steel base material. These charts were drawn by a Brush surface analyzer, capable of measuring surface imperfections of the order of *one millionth* of an inch. Each vertical division on the chart represents a departure from absolute smoothness of .000005". Although total surface variations in an aluminum base cannot be kept less than about ten millionths of an inch, the perfectly smooth glass surface does not vary by even as much as *one*

(*Continued on Page 2, Col. 1*)

Tony Schwartz, commercial artist, collects and exchanges recorded folk music from all over the world

Tony Schwartz working on exchange material in his home recording studio.

Many interesting and unusual communications come to the editor of Audio Record One of the most unique, however, was an Audiodisc recording which told the story in words and music of Tony Schwartz and his "musical swap shop". In fact it told the story so simply and directly that we have transcribed it verbatim for the benefit of our readers. Here's what it says:

"Hello. My name is Tony Schwartz. I am very interested in collecting and spreading folk music. I live at 457 West 57th Street, New York 19, N. Y. I am a commercial artist by profession. I have been recording folk music for over five years and have many songs. The majority of material is originally recorded by myself. I have music from all over the United States, Puerto Rico, Peru, Brazil, Canada, China, Czechoslovakia, Greece, Spain, Soviet Union, Hungary, England, France, Scotland and

(*Continued on Page 3, Col. 2*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 7, NO. 3 MARCH, 1951

Glass Base Audiodiscs

(*Continued from Page 1, Col. 1*)

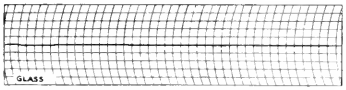


Fig. 1. Surface characteristics of glass base.

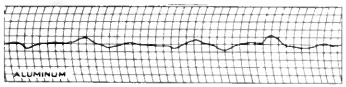


Fig. 2. Surface characteristics of aluminum base.

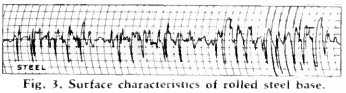


Fig. 3. Surface characteristics of rolled steel base.

millionth! In addition, the glass base is dimensionally stable at all normal temperatures and atmospheric conditions — absolutely free from any tendency to warp or buckle. This extreme smoothness and flatness gives the glass-base Audiodisc a mirror-smooth surface which approaches the ultimate in recording perfection.

The new glass base Audiodiscs which are now being produced have been materially improved over those manufactured during the last war, in one important detail. That is the method of attaching the fiber center-hole insert to the glass base. To explain this more fully, let us go back to some of the early developments in the manufacture of the glass-base disc.

The first discs were made with only a center hole, drilled directly into the glass. The drive pin holes were omitted because it was found that a disc with only one hole was infinitely stronger than one with two or more holes. The lines of weakness in the glass between the closely spaced holes resulted in excessive breakage in handling. From an operational standpoint, the one hole disc was entirely practical, for the clamping friction in most recording machines was ample to prevent slippage while recording. The hard edges of the glass, however, had an objectionable tendency to scratch the metal center pin. To avoid this, a larger hole — about 3/4" in diameter — was drilled in the center and a fiber insert, the same thickness as the glass, was placed in this hole. After coating, the center hole was punched in this insert. However, since the one-hole disc required some modifications or adjustments in a number of turntable and feed mechanisms, recordists preferred the standard pin drive. This was later achieved, without weakening the glass, by drilling one large, 2 1/2" diameter hole in the center, with a fiber inset in which the center hole and three drive pin holes were punched after coating. (This development was patented, and carries U. S. Patents No. 2,283,797 and 2,295,938). The fiber insert was held in the glass base by friction and the lacquer coating which was applied over it sealed it in place. This method, although far superior to anything else available at the time, was not completely fool-proof, and—under unfavorable conditions—a center hole insert would sometimes pop out of the disc. In the new glass base Audiodiscs, the fiber insert is permanently bonded to the glass in such a manner that it cannot come loose or buckle and pop out. This is accomplished by means of an extended flange on one face of the insert, which overlaps onto the face of the glass and is cemented in place before coating, as illustrated in Fig. 4. The insert is made slightly smaller than the hole, and, after coating, it is completely sealed in by the lacquer, yet has sufficient room to expand or contract without danger of coming out.

The glass base Audiodiscs are precisely manufactured to extremely close tolerances for overall thickness, which is kept the same as on the conventional aluminum base disc. They can therefore be used on all recording machines without any modifications or special adjustments.

The mechanical strength of these glass base discs is much greater than might be supposed. This extra resistance to accidental breakage has been achieved through scientifically correct strength-to-weight ratio, with the coating supplying a high percentage of the total thickness. The glass used also possesses a high degree of resiliency which will easily absorb light impacts without cracking or shattering. It is true, of course, that glass base discs are more fragile than their non-breakable aluminum base counterparts. It is also true, however, that any impact of sufficient force to break a glass base disc would, in all probability, cause irreparable damage to the coating of an aluminum base disc. Since all recording discs must be handled with care, the recording engineer, as a general rule, doesn't have as many "thumbs" as most people. The likelihood of breakage in handling is therefore very slight. Breakage in shipment, however, would ordinarily present a much more serious problem. But this also was solved through experience gained during the last war. Audio has developed special, re-usable wood packing cases which are approved by the transportation companies and permit the shipment of glass base discs with practically no danger of breakage.

Many prominent recording engineers observed the fact that glass base discs sound *better* and *clearer* than aluminum base discs. Ordinary test instruments, however, gave no clue as to the exact nature of this audible improvement. Distortion and frequency response tests showed no measurable differences. The improved tone quality — though still unexplained by accoustical analysis—remains a recognized characteristic of the glass base disc.

The new and improved glass base Audiodiscs are now being produced in the following types and sizes:

Red Label	12" 16"
Single Face Red Label	12" 16"
Yellow Label	12" 16"
Reference Label	12" 16"

All orders for Audiodiscs will be filled, as far as possible, with standard aluminum base discs. Where their availability is limited, the balance of the quantity ordered can be supplied with glass base discs. In all cases, however, glass base discs will be supplied only upon specific approval by the customer. Many experienced recordists will prefer to use glass base Audiodiscs for all of their most critical instantaneous recording requirements. These discs can, of course, be supplied in ample quantity to avoid any restrictions as to their use.

By making glass base discs available now, Audio Devices is able to maintain full production and keep recordists from being inconvenienced by the aluminum shortage.

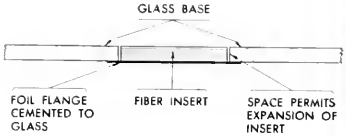


Fig. 4. Cross sectional sketch showing method of sealing fiber center-hole insert to glass base Audiodiscs (thickness exaggerated for clarity). Actual fiber insert shown at right.

audio pointers for the Recordist

by C. J. LeBel, Vice President, Audio Devices, Inc.

LICENSING OF RECORD CRITICS

C. J. LeBel

As many of our friends have often complained, we have no particular respect for sacred cows. Worse yet, we have no hesitation about placing our head in a lion's mouth. So this month we express our disrespect for an important part of the record field—the record critic. We feel that the critic's traditional immunity from punishment has led to serious carelessness in the handling of easily established facts.

The Artistic Side

The artistic aspect of record criticism is of course a matter of opinion, and presumably impossible to evaluate objectively. Nevertheless, we are driven to note the lack of correlation between critics, and a statistician could probably show that critical reactions to any given record would be completely random in nature. One complains bitterly about the lack of reverberation in a given record, while the next inveighs against its utterly excessive reverberation. They cannot both be right.

Technical Aspects

When we come to the record critics' technical remarks we have a very different situation. Technical points are objective, not subjective, and there is only one correct answer. The critic is either correct or incorrect, and he has nothing to hide behind.

We recall one critic who for many months attacked all microgroove discs as hopelessly over-recorded. Eventually he discovered that his pickup was obsolete,

(*Continued on Page 4, Col. 1*)

Musical Swap Shop

(*Continued from Page 1, Col. 3*)

others. The material is performed by people of all walks of life. Some are professionals. I would like to exchange music with you. I can make or play material on wire, tape or disc. I am interested in songs or music that people sing or play in their conscious or unconscious efforts to make the world a better place to live in. Songs of work, dance, protest or pastime. I hope you don't mind other people hearing what you send me. If you do, please say so and it will go no further. Here are a few short sections of various songs to give you an idea of the type of material I have in mind." (A brief musical excerpt follows each item listed.)

"The first is a Peruvian mountain song . . . An American work blues . . . A fishermen's song of the menhaden off the Jersey Coast . . . A Negro spiritual . . . A Negro gospel song . . . Next is a bit of a Spanish song from Peru . . . A Spanish guitar . . . A Chinese song . . . A Gaelic song . . . A Czechoslovak song . . . A song from a political rally . . . and last, group singing.

"I hope these have given you an idea of the type of material I have recorded. I have found many friends more interested in swapping songs by recording than by the written music, because they get a better idea of the song in its presentation. If you are interested in any of the songs I have recorded or would like to send or swap me some of the songs you or your friends sing, please send me any recorded wire, tape or disc message. My recording equipment can play 78 rpm, 33⅓ rpm records, any wire recording, and 7½" or 15" per second single track tape recordings. I can play double track tape only if one track is left clean. I am looking forward to hearing from you."

This record was cut from a tape original which Mr. Schwartz made up to serve as an introduction to his extremely interesting hobby. Copies of the record have been sent to contacts throughout the United States and all over the world. He has received answers from over 30 countries, and has collected about ten thousand songs. He obtains his contacts - - the names of people interested in folk music—by reading farm journals, ranch news, cultural magazines (like Audio Record), secular club publications, and through his membership in the Webster Wirespondence Club.

Mr. Schwartz has recorded several well-known artists from their early years—among them, the "Weavers" and Yma Sumac. In fact he has more than fifty hours of recordings of Yma Sumac and her family, including some recordings which she made at the age of 14.

In describing the satisfaction which he has found through this unusual hobby, Mr. Schwartz says- "The world is full of music, and with my hobby I have touched a little of it and found tremendous knowledge and enjoyment."

Most of his recording work is done in his home studio, on a Magnecorder, at 7½ inches per second. The 15 inch speed is also available on this equipment, and is used where the type of program material recorded would benefit from the extended frequency range.

Mr. Schwartz will be most happy to swap recordings with any of our readers who are interested in folk music. "Pen Pals" are out of date, it seems. So if you'd like a new disc or tape pal, get in touch with Tony Schwartz, 457 West 57th Street, New York 19, N. Y.

Two of the "Weevers" putting heart and sole into a special recording for Tony Schwartz' collection of folk music.

Moises Vivanco (left), husband of Yma Sumac and authority on Peruvian and South American music, recording reference material for Tony Schwartz (right).

Record Critics

(*Continued from Page 3, Col. 1*)

his deemphasis incorrect. Another has been complaining about "variation in crossover frequency" of one make. Unfortunately for him, their equipment is of a type least likely to vary in crossover, and the fault one most likely to be caught by the daily maintenance tests. He probably means that the low frequency balance varies more than he likes, because microphone position is not always optimum.

Still a third critic has been sniffing about variations in "preemphasis" of organizations that have not changed their preemphasis, whilst ignoring six actual changes by one organization. Of course, he really means variation in high frequency balance due to microphone placement. Finally, we recall a critic who compared two organ recordings. One was ideal, while he considered the other a very poor likeness to an organ. Actually, both had been faithfully recorded, but they were representative of two entirely different eras in organ building, and naturally sounded different on records.

Our readers can surely multiply these examples a hundred fold.

A Guild

In years gone by quality standards were enforced by the guilds. Perhaps our most competent record critics should organize a guild. Only one who had passed a rigorous examination could use the guild's insignia at the head of his column. His work would be checked, and serious aberrations would be grounds for discipline. The public would soon learn that only a guild member's opinion would be worth attention.

Guild Standards

We may safely assume that a guild examination would include points like these:

1. Musical acoustics
2. Fundamentals of the recording process
3. A performance test on identification of record faults
4. Musical art

Likewise, we may be sure that a critic would be called on to prove the worth of his reproducing equipment—proof that its performance would be adequate to judge modern wide range recording, and also proof that it would be maintained in adequate condition.

A Beginning

It would be utopian to imagine that we could introduce these standards without pressure. This pressure should come from editors. Too often an editor hires a record critic, then fails to check his work. Too many magazines of otherwise high standards fail to carry those standards into their record columns.

New Sound Moving Picture on Audiotape Manufacture Shown to Public for First Time

The 1951 Radio Engineering Show, held at Grand Central Palace, New York, March 19 - 22, proved to be one of the most successful industrial exhibitions ever held. Its 297 exhibits, with six million dollars worth of components, tools and materials on display, drew a record attendance of radio engineers from all over the country.

To those interested in sound recording, the Audio Devices booth was a major attraction. For, in addition to a complete display of all Audio products—discs, tape, film and points—it included a sound-proof studio where visitors were able to see the new sound moving picture in color, "Audiotape Speaks for Itself". This 20-minute film, telling the fascinating story of how Audiotape is made, was shown every hour on the hour. Between showings the studio resounded to the strains of the finest recorded music, on discs and tape—music whose sparkling clarity and brilliance of tone must be *heard* to be *believed*.

Despite the present restrictions on the purchase and use of scrap aluminum, Audio Devices can still pay you top cash prices for your used recording discs. By taking advantage of this long standing policy you not only convert your otherwise useless discs into cash, but help to make additional aluminum available for disc production—which means more new discs for you when you want them.

Audio Devices will pay from 4 to 15 cents each for any make of used aluminum-base recording disc—depending on size, as follows:

10″	4 cents each
12″	8 cents each
13¼″	10 cents each
16″	15 cents each
17¼″	15 cents each

Since these discs are stripped of the old lacquer coating and used for remelt purposes, the above prices apply regardless of the disc type. In other words, a yellow label or reference label disc will bring as high a price as a red label disc of the same size.

Audio Devices will pay cheapest way freight on all shipments of 100 pounds or more. All used discs should be shipped to:

The Audio Manufacturing Corporation
25 Palmer Avenue,
Glenbrook, Connecticut

Every year, Audio Devices pays thousands of dollars for the return of old aluminum-base recording discs. So don't overlook this excellent opportunity to reduce *your* recording disc costs. Old used discs that are "worthless to you" may be worth more than you think. Why not pack them up and ship them to the above address. You'll be surprised at how large the check can be.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 7, No. 4 | 444 Madison Avenue, N. Y. C. | April-May, 1951

Allied Record Manufacturing Co. Now World's Largest Producer of 16" Transcriptions

In February 1951, the K. R. Smith Company — leading manufacturer of custom pressings and transcriptions on the East Coast — officially joined hands with the Allied Record Manufacturing Company, of Hollywood. This combination of Resources and facilities makes Allied the world's largest producer of custom transcriptions for the broadcasting industry. The Hollywood plant has grown steadily over the past 17 years, and now processes about 90 per cent of all transcription pressings produced on the West Coast. And the new K. R. Smith Division, with its own well-established plant in New York City, is currently handling the processing work for over 80 per cent of the broadcasters in the East.

Mr. Smith, manager of Allied's Eastern Division, has been in the transcription and phonograph record processing business for 25 years. He attributes the growth of his Company largely to the fact that the emphasis has always been on fast personal service in meeting both the normal and emergency needs of the industry. It often takes a miracle of production skill to turn out hundreds of top quality Vinylite pressings in time to meet the emergency deadlines that are the rule rather than the exception in radio work. And it takes a lot of personal service and follow-through, too, to solve the pressing problems that are the order of the day at both of Allied's processing plants.

Despite the requirements for high-speed production, the quality of transcription pressings must be maintained at a much higher level than that which would be acceptable for ordinary phonograph records. Although Allied's transcriptions are produced to NAB Standards, these are considered as basic minimum requirements

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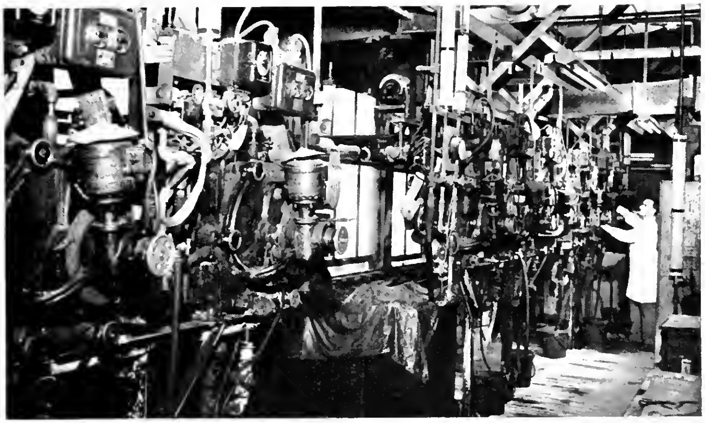

Bank of special high-speed copper plating machines at the New York processing plant of Allied's K. R. Smith Division. These platers, which cut plating time by more than 60%, are a development of the Western Electric Company, and this is the only plant in the country which is licensed to operate them.

Pioneer Tape Recorder Installation at The American University Proves of Great Value to Students and Instructors

Competent authorities have long realized that the *best* way to learn a foreign language is *by ear*. But it was not until the advent of the tape recorder that this method of language instruction really came into its own. During the past few years tremendous strides have been made in the use of tape recordings for language study — culminating in the so-called "electronic language laboratory".

The largest installation of this type — at Georgetown University — was described in the January issue of Audio Record. Our readers will also be interested to know that another electronic language laboratory has been in operation since October 9, 1950 — at The American University in Washington, D. C. This is believed to be the first laboratory of its type in use by any college or university in this country. Although it preceeded the Georgetown installation by about one month, the American University's laboratory follows the method of language instruction which was inaugurated by Georgetown University's Institute of Languages and Linguistics.

In this new method of instruction, tape recordings are used to give students many extra hours of supplementary drill in listening and responding to recorded exercises. The fundamentals of the spoken language, and grammar which is taught inductively, are presented to the student in regular classroom lectures. After each lecture he obtains the much-needed practice in the language laboratory periods. The student thereby receives many more "contact hours" with the spoken language than would be possible under the older system using the same instructional staff. The necessity of endless repetition on the part of the instructor is avoided by the obvious method of using recorded language drills. The tape recorder has proved to be ideally suited to this job.

(*Continued on Page 7, Col. 2*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

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Custom Pressing

(*Continued from Page 1, Col. 1*)

only, and no pains are spared to maintain consistently higher quality in every pressing that is turned out for broadcast use.

At the K. R. Smith Division, two different types of processing are used — depending on the number of pressings required and the replacement value of the original master recording.

Where a limited quantity of pressings is required and the master recording is "expendable", single-step processing is employed. In this operation — described in Steps 2 to 12 on the following pages — the metal matrix (negative) made directly from the lacquer master, is simply faced by chromium plating, and is used as the stamper. This is, of course, the quickest and most economical method, but it does not give any protection for the original recording. When the plated matrix is stripped off of the lacquer master (Step 6), the latter is often destroyed in the process. For all practical purposes, therefore, it must be assumed that the lacquer master *will* be destroyed during processing, and that it can not be used again for making a new matrix when the stamper wears out. Actually, as many as 500 pressings can usually be made from the master matrix. But, to be conservative, this single-step processing is normally used only where about 200 pressings or less are required.

Where more than 200 pressings are to be made, or where the original master must be kept available for possible future use, three-step or "full protection" processing is used. In this method a metal "mother" is made by plating the master matrix — giving an exact duplicate of the original recording, in metal instead of lacquer. This metal mother is then plated in essentially the same manner as the original lacquer master to produce the negative stampers. The gold sputtering or silvering operation, however, is omitted, since the surface is already conductive. The matrix and metal stamper are chemically treated to permit a clean separation of the subsequent plate. Many stampers can be made from one metal mother without any loss of quality.

One item of the processing equipment at the K. R. Smith Division plant is of particular interest, as it is unique in the record-making industry. That is a battery of special, high-speed rotary copper plating machines. In these compact electroplaters the plated disc and copper anode are spaced only a fraction of an inch apart and rotated in opposite directions, while the electrolyte (acid copper solution) is circulated between them under pressure. It is thus possible to build up a uniform copper backing .060" thick in 4 hours, as compared to a plating time of 18-24 hours for conventional tank plating methods. The electrolyte for a bank of high-speed platers is circulated in a closed system from a supply tank, in which the solution is constantly maintained at the proper concentration. Conventional tank plating is also used where time permits, giving additional plating capacity and making the high speed platers more readily available for the rush jobs.

Silvering and gold sputtering are both used at the Smith plant, depending on the preference of the client.

To make sure that every pressing measures up to the most exacting quality requirements, rigid tests and inspections are continually made in every step of manufacture. As a typical example, every tenth pressing is played all the way through on specially designed monitoring equipment. Any imperfections which might develop in the stamper can, therefore, be "caught" with a minimum of waste production.

Although Allied specializes in transcription processing, many high quality phonograph records are also produced in the two plants. In addition Allied is equipped to record on disc or tape, ship products to broadcasters and dealers, store metal masters for future use, and can arrange to prepare scripts, make orchestral arrangements, secure talent and technicians and furnish recording studios throughout the United States.

To assist professional recordists in making the best possible master recordings, Allied has recently produced a new, up-to-the-minute edition of its popular handbook, "Suggestions for Professional Master Recording". For a free copy of this publication, write or call K. R. Smith Division, Allied Record Manufacturing Company, 619 West 54th Street, New York, N. Y. — or Allied Record Manufacturing Company, 1041 North Las Palmas Avenue, Hollywood 38, California.

Bank of supplementary copper plating tanks, at the Allied plant. These tank platers are used for non-rush production, increasing the availability of the high-speed plating machines for high priority work.

Complete audio testing of all metal "mothers" is just one of Allied's many exacting quality-control measures. In addition, *every tenth pressing* is played all the way through, to catch any imperfections which might possibly develop in the matrix or stamper.

Thousands of metal masters are catalogued and stored in Allied's huge transcription library, for the convenience of customers in ordering additional pressings. Each master is carefully packaged for full protection against dust, dirt or mechanical damage.

HOW TRANSCRIPTIONS ARE MADE

(Photos and Data, Courtesy of K. R. Smith Division, Allied Record Manufacturing Co.)

1. ORIGINAL MASTER RECORDING

Discs used for master recording (such as Master Audiodiscs) require the utmost in surface perfection as no pressing can be any better than the master from which it is made. Master discs are larger in diameter than the final transcription or record size, to give the extra clamping surface needed for processing and pressing. 12", 13¼" and 17¼" masters are used for 10", 12" and 16" pressings respectively. Only one side of a master can be processed. The final recording, therefore, must be cut on only *one* side of the disc.

2. GOLD SPUTTERING

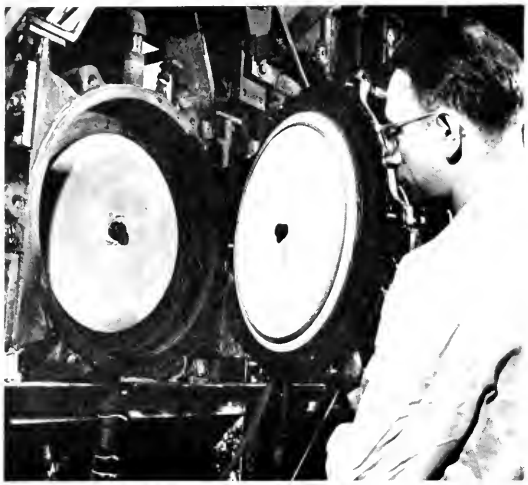
To make the surface of the disc conductive for subsequent plating operations, it is cathode sputtered with gold. The disc is placed in an evacuated chamber, mounted on a water-cooled platen between a gold leaf cathode and an anode. A dc potential of 3000 volts is applied and a glow discharge takes place between cathode and anode. Molecules of gold released from the cathode by secondary emission are deposited on the recorded surface of the disc in a fine homogeneous layout about .000001" thick. The entire sputtering process takes about 20 minutes.

3. SILVERING

Silvering, instead of gold sputtering, is frequently used as an alternate method of metalizing. This process, which is similar to the silvering of mirrors, involves the chemical deposition of finely divided silver particles from an ammoniated silver nitrate solution. The disc is covered simultaneously with the silver nitrate solution and a special catalyst, causing the metallic silver to be precipitated in a thin layer on the surface. The silvering, which is done under carefully controlled temperatures, takes about 10 minutes.

4. COPPER PRE-PLATING

After gold sputtering or silvering, the disc is electroplated with a thin layer of very fine grained copper. The disc is rotated in an acid copper plating solution, while a direct current of about 30 amperes per sq. ft. builds up a plate about .001" thick in about 30 minutes. Extreme fineness of grain is necessary in the layer of copper which is in contact with the gold or silver surface. This process is too slow to be used for building up the full thickness of the copper backing.



5. COPPER BACKING

After pre-plating, the metallic layer on the disc is built up to the required strength and thickness by additional electroplating of copper on the pre-plate. In the special high-speed platers shown above, the disc and copper anode are spaced close together and rotated in opposite directions in a sealed chamber, with acid copper electrolyte circulated rapidly between them under pressure. A copper plate .060" thick is built up in 4 hours, as compared to 18 to 24 hours for ordinary tank plating.

6. STRIPPING

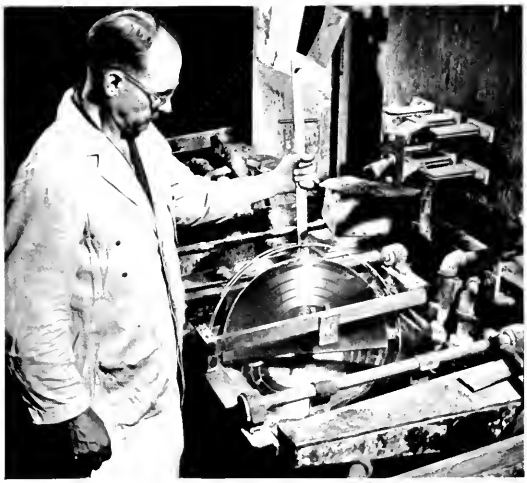
The finished metal matrix (negative) is separated from the lacquer master (positive) by mechanical means. A sharp tool is inserted between disc and plate at several points, and the disc is carefully pulled away, leaving the metal matrix with a gleaming, flawless gold or silver finish. The lacquer master is often destroyed in this process, and if full protection for the original is required, a metal "mother" is made from the matrix (as described on Page 6) by further electroplating operations.

9. CENTERING

Precise location of the center hole is extremely important, as even a few thousandths of an inch deviation can cause objectionable wows in the finished pressings. The exact center of the disc is located by microscope or dial indicator, and a center-hole insert is soldered into the metal matrix accurately centering the disc for all subsequnt operations. The original center hole can not be used for this purpose because of its tendency to become enlarged during the plating operation.

10. BACK TURNING

The back of the metal matrix must be made perfectly smooth, as any high spots in the plating would push through to the surface in the subsequent pressing operation. The disc is mounted on a lathe and the back is machined to extreme flatness by removing a thin shaving of metal from the entire surface. Grinding can also be used for this purpose instead of machining.

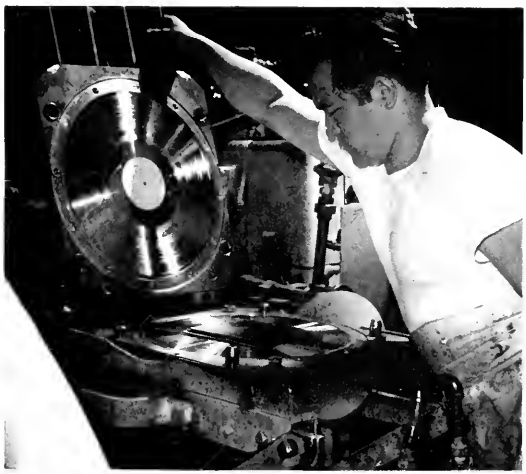


7. ELECTRO-CLEANING

After the metal matrix is separated from the original lacquer disc, its surface must be thoroughly cleaned to remove any traces of grease or other impurities. This is done by immersing the matrix in a strong alkaline solution, agitated by means of an electric current. This method is superior to polishing with rouge, because it cannot affect the frequencies originally recorded on the master.

8. CHROME FACING

Since gold and silver have an affinity for Vinylite plastic, the face must be chromed to prevent sticking in the press. This is done by electroplating a thin layer of chromium over the gold. With a silvered disc, the silver is removed and the chrome is applied over the copper pre-plate. The chromium plate is so slight that it does not effect the frequency response at 15,000 cycles, yet it is sufficiently hard and durable to permit making as many as 2000 pressings without wearing away. The flash chromium plating operation takes about 9 minutes.



11. PRESSING

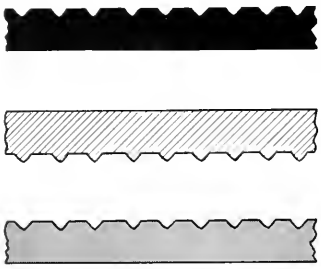
Two metal matrices, or "stampers", are mounted in the record press, one for each side of the transcription. Labels are inserted, a preheated "biscuit" or preform of Vinylite plastic material is placed between the "stampers" and the press is closed. The two stampers are forced together hydraulically at a pressure of 1800 to 2000 pounds per square inch. The pressing cycle is automatically controlled, and takes from 25 to 75 seconds, depending on disc size and type of material being molded.

12. THE MOLDED TRANSCRIPTION

After the disc is removed from the press, the excess Vinylite is trimmed off and the edges are polished. It is then ready for shipment. The 12 operations shown here illustrate the "single-step" method of processing, which is used only where a small number of pressings is needed. The three-step, or "full protection" method is much more frequently used. The actual operations are essentially the same, but many more steps are required. This is illustrated diagrammatically on the following page.

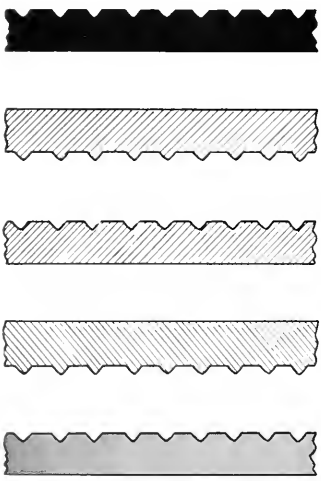
HOW TRANSCRIPTIONS ARE MADE

SINGLE-STEP PROCESSING



Although as many as 500 pressings can usually be made from one metal matrix, the single-step method of processing is normally used only where about 200 pressings or less are required — and where the original master recording is "expendable". Since the lacquer master is frequently destroyed when it is separated from the metal matrix, the recording can not be duplicated after the matrix has worn out.

THREE-STEP PROCESSING



The three-step, or "full protection" method is generally used where more than 200 pressings are to be made, or where the master recording must be kept available for possible future use. The metal "mother" is made by electroplating the matrix, and the stampers are made by electroplating the "mother". Many stampers can be made from one metal "mother" without any loss of quality. Gold sputtering or silvering is not required when plating the matrix and "mother". The surface is chemically treated to assure a clean separation of the finished plate.

PHONOGRAPH RECORDS

As far as the individual operations are concerned, phonograph records are made in exactly the same way as transcriptions. However, where many thousands of records must be made from one master matrix, a number of "mothers" are made, from each of which many sub-master matrices are produced. Additional "mothers" are made from the sub-master matrices, so that hundreds of stampers can be produced.

Most high-quality phonograph records are made of Vinylite. Less expensive records, known as shellac pressings, are made from a mixture of diatomaceous earth and shellac, with small amounts of coloring agents, plasticizers and lubricants added.

With the advent of the new Long Playing microgroove records, small 45 rpm records, and new light-weight reproducers, quality standards for phonograph reproduction have been radically improved. To measure up to these standards, pressings for the improved phonograph records must be of transcription quality. This has placed greater emphasis than ever before on the quality requirements for master recording discs.

by C. J. LeBel, Vice President, Audio Devices, Inc.

TAPE LIFE

C. J. LeBel

Occasionally we find inspiration for an article in our correspondence file; a subject that prompts many letters is generally a live one. This paper is correspondence-prompted.

There is a growing tendency to store material of historical interest on magnetic tape, material that is likely to be of priceless value ten or twenty years from now. We deplore this tendency, even though the basic idea is not unsound — for it is almost always done with gross disregard for chemical and physical realities.

The life of tape has two aspects: magnetic and physical. As to the life of the magnetic record itself, we find no information in the literature. We may expect a slow loss of magnetism with time as with all permanent magnets, but we cannot tell whether it will be proportional or whether it will affect the peaks more (and so create distortion). Conditions in the magnetic circuit are such as to lead us to expect that the demagnetizing effect will be significant, but we cannot yet judge whether it will be serious in ten years, or in fifty.

One effect has already been noticed, a tendency toward magnetic printing. We are inclined to blame this on the tendency to over record, a tendency which has other bad effects. If the peaks are recorded at a level higher than that corresponding to 2 per cent harmonic distortion, the tendency for magnetism to transfer between adjacent layers becomes significant, raising the apparent noise level. Many studios and broadcasters are recording peaks in this danger region. Tape storage at high temperature will enhance the effect greatly.

The physical life of tape concerns us more deeply. A weak, distorted, or noisy tape can still be used, but if it breaks every few feet during reproduction, it is useless.

The cellulose acetate we use as a base has existed in its present composition for over twelve years. Laboratory samples made then are still in good condition, but some tape has been known to become hopelessly brittle in two or three months. Which fate will meet your most prized recordings? It depends entirely on your storage conditions. Motion picture film has for many years been successfully stored under controlled conditions, and the studio will have to adopt the same practice if long life is to be achieved.

Some years ago we pioneered in developing kraft paper as a tape base material; that we were right in our judgment may be inferred from the fact that every other tape maker has followed our example. In the closely akin form of condenser paper, this material has existed for many years, with satisfactory life characteristics. However, in a condenser it is well protected from adverse influences, and long-term mechanical strength is not as important. From data on the life of book paper, we may expect it to react adversely to improper storage conditions.

We, therefore, suggest that tape of historical importance should be stored at 65 to 70° F., and a relative humidity of 50 to 70 per cent. If this is difficult, at least keep in a humidifier can such as is used for 16 mm. film, and store in a cool location. If you insist on storing the tape, without protection, in a hot dry closet, you may expect its life to be reduced at least 90 per cent.

Language Lab

(*Continued from Page 1, Col. 3*)

The American University language laboratory consists of two adjoining rooms, each equipped with tape recorders and listening positions. The larger room contains 27 listening booths, each equipped with a six-position selector switch, by means of which any one of six simultaneous audio programs may be received. In this way students studying different languages can have laboratory periods at the same hour. Each student simply selects his particular language by means of the selector switch. At the back of this room are located three tape recorders, (Brush Soundmirrors, Model BK-414U). These machines supply the audio signal to three of the six channels.

In the adjacent room, there is a large soundproof recording booth — used by the instructors and students for making tape recordings. This room also contains eight additional listening outlets, each equipped with a six-position selector switch. The other three recording machines are also located in this room, supplying the audio signals to the remaining three channels. The audio output signal from any one of the six tape recorders may be received at any listening position in either of the two rooms.

The electrical controls and wiring for this language laboratory were purchased from the International Business Machines Corporation, and are of the type used at the United Nations meetings for simultaneous translation.

This multi-lingual tape recorder system has proved to be of great value to both students and teachers. As its advantages become more widely recognized, installations of this type will certainly increase in number. In the not too distant future we may find a well equipped language lab in every college and university in this country—and in many progressive high schools, too.

Section of the main listening room during a regular language laboratory period, showing 14 of the 27 individual booths. The sliding fronts of the booths, which are normally up for this type of work, were lowered to show the students.

(Photos by Miss DeAnne Hays, Bethesda, Maryland)

Operator monitoring a language recording from one of the three Brush "Soundmirror" tape recorders at the back of the main listening room (above), at The University's electronic language laboratory.

New TV-FM-AM Radio-Phono-Recorder Combination Console Offers Complete Facilities for Home Entertainment

DuMont's new Westminster Series II Console has been described as the world's most comprehensive instrument for home entertainment. It takes but a glance at the multiplicity of services provided to agree that this is a pretty valid claim.

This unit is of particular interest because, to the best of our knowledge, it is the first commercial console type instrument to include provision for high quality home recording on magnetic tape.

The tape recorder, housed in a separate draw-out compartment, is arranged to provide the following facilities: record from microphone — record from TV sound — record from FM radio — record from AM radio — record from 78, 33-1 3 or 45 rpm records — play back any recording through console speaker — monitor while recording (through console speaker).

The tape recorder has an International Electronic Corporation transport mechanism made by Universal Molded Products, of Philadelphia. DuMont's specifications call for a frequency response which is flat within 3 db from 70 to 7000 cycles. This is a minimum performance requirement, and actual measurements on representative production units show a response that is within the 3 db limit for a somewhat wider range — usually from 60 to 8000 cycles. Distortion is less than 5% on a signal recorded and played back at maximum level. Since this type of distortion is principally second harmonic, the least objectionable variety, the average listener can detect little or no difference in tone quality between the tape recording and the sound from which it was made. Noise level is limited to a minimum of 35 db below full output — actual production averaging about 38 db. This is better than that obtained from the best shellac records and entirely comparable to that obtained from Vinylite microgroove pressings.

Maximum simplicity of tape threading and machine operation were essential requirements in the design of this equipment. The tape mechanism, which is the same as that used on the "Reelest" portable recorder, is entirely self threading. The tape is simply dropped into a slot and a threading lever automatically brings it into proper alignment and contact with the three magnetic heads — one for play and record and two for erase.

The recorder is of the dual track type with a speed of 7½ inches per second and automatic reversal — providing up to one full hour of recording on a 7 inch reel. A neon recording level indicator provides for simple adjustment of optimum recording volume. An automatic timing mechanism, which will turn the set on or off at a predetermined time, can also be adjusted to operate the recorder automatically on a pre-arranged schedule.

It is interesting to note that DuMont dealers have been making excellent use of the recording feature to help sell the Westminster sets. By recording appropriate sales talks they actually let the equipment speak for itself — a feature which adds greatly to the effectiveness of the sales room demonstration.

The development of this instrument makes a significant trend in the ever increasing popularity of magnetic tape recording for home entertainment.

These initials stand for National Scholastic Radio Guild, an association of high school radio and/or TV workshops over the country. Through NSRG, member workshops receive each year:

1. News of other workshops— in four bulletins of *The Radio Workshop*.

2. Four non-royalty scripts.

3. Information on technical and engineering developments.

4. News of new books and pamphlets on radio-TV.

5. Announcements and invitations to conferences on radio workshops.

6. Membership pins and cards, and a suggested workshop constitution. Membership fee: $4 per year per school. For membership blanks, write: National Scholastic Radio Guild, 7 East 12th St., New York 3, N. Y.

"Compco" Fiber Shipping Cases Designed to Give Extra Safety for Discs

The Compco Corporation, 2251 West St. Paul Avenue, Chicago 47, Illinois, has recently announced a new line of sturdy, light-weight transcription shipping cases. They are available in 10½", 12½" and 16½" sizes (1½" deep), for 10", 12" and 16" discs respectively. The cases are of tough, non-vulcanized fiber, with steel reinforced corners, strong 1" web straps, and compartments for 4 film strips. Prices and additional data can be obtained from the manufacturer.

audio record

PUBLISHED BY AUDIO DEVICES, INC.

Vol. 7, No. 5 | 444 Madison Avenue, N. Y. C. | June-July, 1951

Scholastic Magazines and AER Pick Prize-Winning Radio Scripts in Audio-Sponsored Student Competitions

The top student script writers of 1951 have now taken their places in the literary hall of fame — and have collected well deserved cash awards in recognition of their efforts.

The Scholastic Magazines' National Radio Script Writing Contest has selected twenty four prize winning entries written by High School Students in 16 states and the District of Columbia. And, in the higher fields of education, the National Radio Script Contest conducted by the Association for Education by Radio (AER) has announced the award winning entries from the hundreds of scripts submitted by College Students throughout the country.

To the talented winners — to the many hundreds of other contestants who submitted such excellent scripts — and to the teachers who have done so much to develop the writing ability of these students,

(*Continued on Page 2, Col. 1*)

WINNERS OF SCHOLASTIC MAGAZINES' RADIO SCRIPT WRITING COMPETITION

First Prize—Original Radio Drama, William L. Galarno, Saginaw, Mich.

First Prize—Radio Drama Adaptation, Lila Kronstadt, Brooklyn, N. Y.

First Prize—General Radio Script, Geraldine G. Heuermann, St. Louis, Mo.

WINNERS OF CLASSIFICATION 12 IN A. E. R. CONTEST

First Prize—Meric L. Legnini, Havertown, Pa.

Second Prize—William H. Robinson, Jr., Brooklyn, N. Y.

Third Prize—William A Coffield, Brooklyn, N. Y.

Johnny Vadnal and his orchestra cutting a new Victor record at Schneider's Recording Studio Lab. At center (standing) is Alexander Bard, Victor International Music Head.

Unique Combination of Musical Science and Audio Engineering Enables Schneider Recording Studio Lab to Give Clients the "Full Treatment"

Musicians, composers and radio writers in the Cleveland area know Hank Schneider well, and have a healthy respect for both his musical talent and his engineering ability as a professional sound recordist. That's because the Schneider Recording Studio Lab at 1303 Prospect Avenue, Cleveland, has established a unique reputation as a source of both artistic and technical service in all kinds of musical

(*Continued on Page 4, Col. 1*)

audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

VOL. 7, NO. 5 JUNE-JULY, 1951

Script Contest Winners

(*Continued from Page* 1, *Col.* 1)

we extend our sincere congratulations for a job well done.

Mr. William D. Boutwell, of Scholastic Magazines, reports that more than 525 scripts were entered in this year's Writing Awards competition, and that these entries showed greater variety of subject matter than ever before. Many of the scripts were in support of civic enterprises, such as the Red Cross, safety projects, better English in the schools, etc. Also, more scripts showed evidence of having been produced before being entered in the contest, which indicates wider school use of local radio stations. One TV script was entered this year, for the first time. Many of the scripts were from member schools of the National Scholastic Radio Guild.

Following is a list of the national winners in the Classifications sponsored by Audio Devices.

SCHOLASTIC MAGAZINES' Radio Script Writing Contest (High School Students)

Judges: Albert Crews, Promotion Director, Protestant Radio Commission; Irve Tunick, free lance radio writer; Olive McHugh, English Department, DeVilbiss High School, Toledo; Gertrude Broderick, Radio Script Division, U. S. Office of Education; and Armand Hunter, Chairman, Radio-Speech Theatre, Temple University, Philadelphia.

Original Radio Drama

FIRST PRIZE — $25.00;
William L. Galarno
Arthur Hill Sr. High School,
Saginaw, Mich.
"The End of the Journey"
Teacher — Mattie G. Crump*

SECOND PRIZE — $15.00;
Richard S. Reamer, Jr.
Elkhart Senior High School,
Elkhart, Ind.
"Emergency Assignment"
Teacher — Galen Wenger

THIRD PRIZE — $10.00; **Thomas J. Walsh**
Gonzaga High School,
Washington, D. C.
"The Emerald Flame"
Teacher — Joseph Kerns, S J

FOURTH PRIZES — $5.00 Each
Virginia Ann Mills
Nazareth Academy, Rochester, N. Y.
"Joey"
Teacher — Sister Evelyn
Carmie Amato
John Adams High School,
Cleveland, Ohio
"Lefty"
Teacher — Miss Agnes Lee
Richard O. Martin
Idaho Falls High School,
Idaho Falls, Idaho
"The Invader"
Teacher — Miss Afton Bitton
Maurice McInerney
Cathedral High School, Denver, Col.
"Unheavenly Heaven"
Teacher — Sr. Therese Martin
John Gilmore Bansch
Helena High School, Helena, Mont.
"Pug's Version of the 1950 Season"
Teacher — Mrs. Doris Marshall

Radio Drama Adaptation

FIRST PRIZE — $25.00; **Lila Kronstadt**
James Madison High School,
Brooklyn, N. Y.
"Salvador and the Goat"
Teacher — Mrs. E. Freiheher*

SECOND PRIZE — $15.00; **Marilynn Hall**
Mackenzie High School, Detroit, Mich.
"The Man Who Could Work Miracles"
Teacher — Benjamin Meckler

THIRD PRIZE — $10.00; **Sue Wyche**
Las Vegas High School,
Las Vegas, New Mexico
"Champion Stock"
Teacher — Miss Nell Doherty

FOURTH PRIZES — $5.00 Each
Edward J. Golden
Boston Latin School, Boston, Mass.
"Great Expectations"
Teacher — Gordon F. Irons
Barbara Smith
Laconia High School,
Laconia, New Hampshire
"A Punt for Billy"
Teacher — Mrs. Ruth P. Estes
Wesley M. Pollard
Helena High School, Helena, Montana
"The Monkey's Paw"
Teacher — Doris M. Marshall
Robert B. Yegge
East High School, Denver, Colorado
"A Christmas Carol"
Teacher — Thomas Gilligan
Betty Hall
Roosevelt High School, St. Louis, Mo.
"The Car"
Teacher — Olga Solfronk

General Radio Scripts

FIRST PRIZE — $25.00;
Geraldine G. Heuermann
Central High School, St. Louis, Mo.
"The Stars Point The Way"
Teacher — Miss Lorraine Lowry*

SECOND PRIZE — $15.00;
James D. Stasheff
A. B. Davis High School,
Mt. Vernon, N. Y.
"The First Performance of Hamlet"
Teacher — Roberta Fleming

THIRD PRIZE — $10.00; **Edward G. Field**
Westfield Sr. High School,
Westfield, New Jersey
"The Vision"
Teacher — Miss Bordner

FOURTH PRIZES — $5.00 Each
Jerold B. Coburn
Edison High School, Miami, Florida
"Teeners, Tunes, and Topics"
Teacher — Mrs. Sophia Derbyshire
Robert Clein
Henry Grady High School,
Atlanta, Georgia
"Henry Grady"
Teacher — Mrs. William F. Smith
Paul B. Hannon
East Denver High School,
Denver, Colorado
"The Red Cross Serves"
Teacher — Mr. Zorlengo
Nancy Rae Riley
Wethersfield High School,
Wethersfield, Conn.
"Junior's First Train Ride"
Teacher — Mrs. M. Windsor
Evelyn MacDougall
Cheyenne High School,
Cheyenne, Wyoming
"The Long Election"
Teacher — Mildred U. Beck

AER National Radio Script Contest (College Students)

Judges: John Bachman, Director of Radio, Baylor University; Thomas D. Rishworth, Director of Radio and Television, University of Texas; and Dr. Sherman P. Lawton, Coordinator of Broadcasting, University of Oklahoma.

Classification No. 12, Scripts for Home and School Recording

FIRST PRIZE — $100.00;
Meric L. Legnini
Temple University, Philadelphia, Pa.
"History is My Beat"
Teacher — Mr. Romulo R. Soldevilla*

SECOND PRIZE — $60.00;
William H. Robinson, Jr.
Washington Square College,
New York University, New York, N. Y.
"When They Count the American Dead"
Teacher — Mr. Irving Falk

THIRD PRIZE — $40.00;
William A. Coffield
Washington Square College,
New York University, New York, N. Y.
"The Scar"
Teacher — Mr. Irving Falk

***Received 25 Audiodiscs, 3 Sapphire Recording Audiopoints and 3 Sapphire Playback Audiopoints — or equivalent value in reels of Audiotape.**

audio pointers for the Recordist

by C. J. LeBel, Vice President,
Audio Devices, Inc.

EVALUATION OF OXIDE

C. J. LeBel

As our readers know, a magnetic recording tape consists of a layer of magnetic iron oxide on a non-magnetic paper or plastic base. The tape characteristics depend almost entirely on the oxide itself — what it is and how evenly it is applied. Since previous articles[1] discussed the question of uniform application, we will in this paper discuss the oxide itself — the material which gives a tape its personality.

Oxides of many different characteristics are possible, ranging from the high-coercive black, through the very popular medium-coercive red, to the old low-coercive red used by the Germans on their Magnetophone. In the course of a development project, the laboratory must evaluate the probable performance of hundreds of oxides on machines presently in wide use. No matter how interesting a material, it has little value if the customer must rebuild his machines to use it properly.

Practical Realities

We may assume at the start that the oxide has good frequency response, and that its modulation noise is low. Were either of these characteristics poor, the material would have been set aside long before.

In most magnetic recorders — both professional and home — noise level is fixed by the machine internal noise, and not by the tape, so maximum output produces the highest signal to noise ratio. The undistorted output limit is set by tape overload, and not by machine distortion, so we want an oxide with maximum undistorted output. At the same time it must also have low distortion at lower outputs. We really need a tape which is inherently more *linear* in its characteristics. Furthermore, this must be attained in the normal bias range of machines in the field, for most machines have fixed bias, and the remainder can adjust their bias only over a limited range. We have much data on the bias of commercial machines in the field, as referred to our laboratory standard head, obtained by using a two tape technique previously described.[2]

Characteristics

As a convenient illustration, we will compare our standard red oxide (on plastic base) tape with a competitor's material for which strong claims are made. The upper graph of Figure 1 shows the relation between bias current and reproducing head output, with a fixed recording signal. Note that at currents below that corresponding to peak output, output increases rapidly with bias; at bias greater than the peak value, output decreases slowly with a large increase of bias.

The lower graph of Figure 1 shows that increase of bias reduces distortion. While these tests were made at the standard 400 cps. frequency, the curves have the same shape at other frequencies. At bias currents above a certain value, the distortion curve levels off at its minimum value.

Since the two graphs use the same bias current scale, a given bias point will be in the same position on both sets of axes. Correlating the two curves, it is clear that as we increase bias current, we first decrease distortion and raise output rapidly. When bias has increased enough to decrease output 2 to 3 db. below its peak value, the distortion curve first reaches a minimum. This is why manufacturers of machines with adjustable bias specify the 2 db. point in their instruction books.

Comparison

It is not easy to watch two graphs simultaneously, so in Figure 2 we have combined the data into a set of output-distortion curves taken at various bias currents.

Referring back to Figure 1, we see that tape O has more output that AUDIO TAPE only in a bias region which is useless because of high distortion. If we jump to Figure 2a, and compare the two oxides with each bias adjusted to peak output, we find that O has higher distortion at any point on the scale. Using the usual 2% point as an index, we find that AUDIO TAPE will give 3db. more output.

In Figure 2b, we find that the difference is 2 db. at the bias for 1 db. below peak output; and in 2c the output difference is 1.6 db. at the 2% point, with the bias for 2 db. below peak. In every case the AUDIOTAPE offers more output at lower distortion. A recheck of Figure 1a shows that AUDIOTAPE has higher sensitivity in the bias region for low distortion.

It would appear that tape O uses inferior oxide. We are inclined to blame the chemist for shifting the bias peak to too low a current, for our own laboratory has observed inferior performance whenever this is done. This probably results from in

(*Continued on Page 4, Col. 3*)

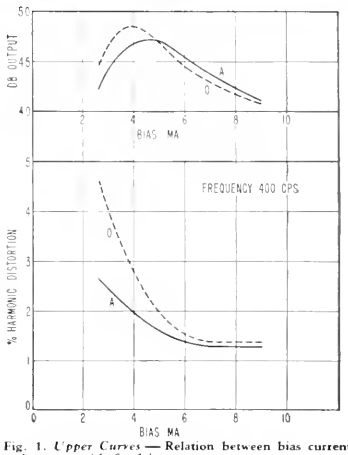
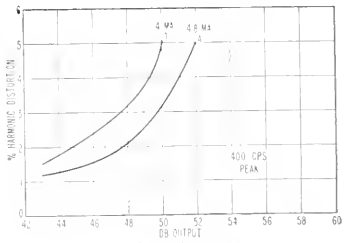
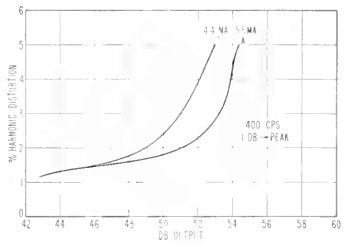


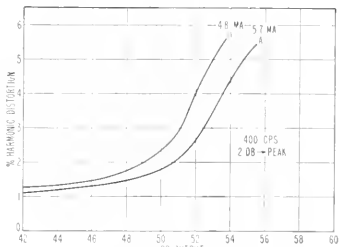
Fig. 1. *Upper Curves* — Relation between bias current and output, with fixed input.
Lower Curves — Relation between bias current and distortion, with fixed input.



(a) Bias current set for peak output.



(b) Bias increased enough to decrease output 1 db. below peak.



(c) Bias increased enough to decrease output 2 db. below peak.

Fig. 2. Relation between output and distortion at various bias currents.

Schneider Recording Studio

(*Continued from Page* 1, *Col.* 3)

recording work. Hank Schneider's unsual background of musical experience has contributed much to his success in the recording field.

Born and raised on the banks of the Mississippi at Quincy, Illinois, Hank took an early interest in music — an interest which was influenced largely by recordings which he heard on the family's Edison Cylinder phonograph. Deciding that music was to be his career, he devoted himself wholeheartedly to its study and practice. Later, he was literally launched on the first step of his professional career — as a trombonist and arranger on the Mississippi excursion boats, where jazz was born and carried up the river from New Orleans. He has been extremely active in musical circles ever since — arranging for name bands and radio stations for more than 25 years.

During the early 40's, extensive Signal Corps sponsored radio training aroused a latent interest in the technical aspects of musical recording and reproduction. This led to the opening of a modest recording business as an avocation in 1945. But Cleveland's fame as a Polka Center soon changed this to a full time vocation — and started Schneider's Recording Studio Lab on the road to recording fame.

This Studio is currently making the original master recordings of Johnny Vadnal and Ernie Benedict for RCA Victor Records. Many other masters have been made here for Decca, Capitol, Mercury, Continental, etc. In addition to polkas and pop recordings, the Schneider Studios have recorded many unusual and interesting types of national and folk music, including Syrian, Serbian, Greek, Hungarian, German and Italian.

Attractive and talented Kay Schneider at the console, in the special organ studio at Schneider's Recording Studio Lab.

Writers of singing commercials like to bring their work to Schneider's as Hank's experience as an arranger can be very helpful in developing them. In fact you can walk into the studio, hum a new tune — and walk out with the complete musical recording.

The running of Schneider's Recording Studio is a family affair, in which Hank gets a valuable assist from his wife, Kay. She has the personality and business ability that make the front office click. And, her musical talents — as organist, pianist, and vocalist — are a real asset to the studio. When a girl's voice is needed, in a singing commercial for example, Mrs. Kay Schneider is often heard in the transcription.

The Schneider Recording Studio Lab is fully equipped with the finest precision equipment for both disc and tape recording. The main recording studio is of ample size to accommodate large orchestral groups, and a smaller studio, equipped with an electronic organ, is provided especially for the recording of organ and vocal selections.

Hank Schneider, now an active member of the Audio Engineering Society, finds that music and sound engineering are very closely related. His clients are glad that he has had so much experience in both.

Part of the Schneider recording room, showing equipment for both tape and disc recording and reproduction.

—designe· isc recordings

LOUISIANA STATE UNIVERSITY has pioneered in the use of audio equipment in teaching languages on a large scale. The present language lab, established in 1947, is one of the largest in existence, with semi-private facilities for 130 students. The individual booths are equipped with turntables, earphones, and microphones, so that students may hear either themselves or records. In addition to teaching Chinese, Russian, Italian, Portuguese, French and German, the lab is used to teach English to foreign students. Its recording facilities are also used to serve the high schools of the state. Teachers in the public school sytem submit material for their own teaching needs and laboratory personnel put it on record in authentic accents. Three soundproof booths provide facilities for making the language recordings used in the lab and elsewhere. Voices used in cutting foreign language discs are supplied by students from the country whose langnage is being studied.

Evaluation of Oxide

(*Continued from Page* 3, *Col.* 2)

creased content of alpha form, instead of the desired gamma form of crystal structure. An extremely small alpha content leads to a poisoning type of effect, far more harmful than would be accounted for by the mere percentage of non magnetic alpha. It is this which sets a desirable lower limit to the bias peak.

References: 1. C. J. LeBel, Modulation Noise, Audio Record, December 1949
References: 2. C. J. LeBel, A New Method of Measure Bias, Audio Record, June-July, 1949

audio record

THEY SPEAK FOR THEMSELVES

PU[illegible]D [illegible]Y AUDIO DEVICES, INC.

Vol. 7, No. 7 | 4[illegible]1 Mc[illegible]n Av[illegible] N. Y. C. | August-September, 1951

Offers State-Wide Educational Service on a No-Charge Basis

"I would found an institution where any person can find instruction in any study." With these words, Ezra Cornell launched what was to be the tremendous university that is Cornell today. And these words have become even more true, thanks to the establishment of the Cornell Tape Recording Center, a library which presents the voices as well as the words of leading authorities in many fields.

The Center is operated by the Radio Services of Cornell's Department of Extension Teaching and Information, under the supervision of L. W. Kaiser, Head of Radio Services, and T. D. Richards, Jr., Instructor in charge of recording. The new 43-page catalog, hot off the press, lists about 450 titles which can be obtained by schools, extension workers or any interested community groups in New York State. This Service is free of charge, the only requirement being that the person ordering a program furnish his own tape onto which the program can be dubbed.

The idea isn't a new one, Kaiser says. There has been increasing demand for this type of service for a long time, but disc recordings, of course, have been rather expensive for limited budgets. Now, tape recording has changed the picture completely. Reasonably high-quality, low-cost recorders and playbacks are available, and many groups already own or have access to them.

Variety is the spice of life, and the Cornell Tape Library is well spiced. Recordings available range from a monumental program on radar contact with the moon to advice on how to take care of the bugs in your cabbage patch. All in all, agricultural and home economics topics are greatest of number. They include material from many departments of Cornell, from the United States Office of Education, and several other foundations producing interesting programs. The Center is also the official upstate repository for the Minnesota Department of Education, which contains a similar service for teachers.

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T. D. Richards, Jr., Instructor in charge of recording at Cornell's Department of Extension Teaching and Information, prepares to make another Audiotape recording to add to the extensive tape library.

Bill Day, Self-made Audio Expert, finds that it pays to learn sound recording the hard way

Bill Day at the controls of his latest (and best) completely home-made, professional-type console tape recorder.

Bill Day, of 1611 Richards Street, Salt Lake City, Utah, is a modest and unassuming young man who does not like to brag about his work. So, if this be bragging, our readers will please understand that *we* are doing it for him.

Although only 26 years of age, Bill Day has been building his own sound recording equipment for the past 14 years. That means that he was only 12 years old when he started building his first recorder. It took 6 months of painstaking effort before it was finished. Unfortunately it didn't work. Undaunted by failure, he immediately started building another. That didn't work either. So he built another — and another — and another, all with the same disappointing results. In fact it took two and a half years and eight recorders before his

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audio record

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

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efforts were crowned with success. But the satisfaction which he obtained from that first successful recorder was multiplied many fold by each of the previous failures. Nor was all that time and effort wasted, for every recorder built represented new problems solved, new lessons learned the hard way — never to be forgotten.

During these early struggles, while still in public school, Bill couldn't afford to spend very much on his equipment. The only money he had was what could be earned by doing repair work for neighbors. He was therefore forced to build practically all of his own components — from microphone to cutter. This included doing all of his own machining work — a task which took a little more time but taught far more about the construction and operation of recording heads and mikes than could have been learned simply by purchasing the complete units.

By the time his first successful recorder had been built, Bill was 15 years old and just entering high school. Seven more recorders were built during his high school years, each one of a new and improved design.

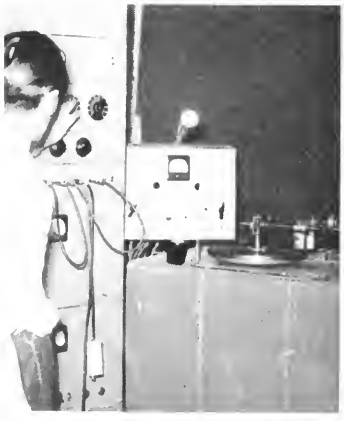
After graduating from high school, Bill's recording progress shifted into high — for he was then able to get a job and have some real income to put into recording equipment. That meant high quality heads and good mikes — so necessary to the building of high fidelity recorders. But then trouble came from another source. For, in his enthusiasm for building recorders, he forgot that there's a limit to human endurance. Long hours of recording work, in addition to his full-time job, proved too much. He lost the job by fainting from overwork.

Later — with a less strenuous job designing and building electronic equipment — he continued to invest his income in more test equipment and parts, while building new and better disc and tape recorders. To date Bill Day has built 23 recorders, the last one at a cost of about $2500 and 2 years' work. None of these recorders have been built for sale, but to replace previous equipment.

Shortly after World War II, Bill started his own business, designing and building electronic equipment. Experience has taught that it can be rough. But he looks at starting a business like building that first recorder — confident that hard work and determination are the key to success. He is now doing some recording work for friends and those who hear about him — hoping for an opportunity to devote his efforts and talents to professional recording work.

Among other important things, Bill has learned that the satisfaction obtained from doing recording work can not always be measured in dollars and cents. During World War II, he made many recordings for friends and relatives of servicemen to send to their loved ones overseas. As an active member of his church, he gathered together groups of from 18 to 60 persons at a time for his recording sessions. Each individual was told to say all he wished when the mike came to him — speaking as if the serviceman were right there listening. This took from 15 to 30 minutes — being recorded originally on tape and later re recorded on discs for shipment overseas. After the war, the thanks of returned servicemen encouraged him to continue the good work — making records for friends and relatives to send to church missionaries in other lands and states. No charge is made for this work, the satisfaction of making the records more than paying for the work involved. To date, more than 700 of these records have been made, and the number will reach 1000 before the summer is over.

All in all, Bill Day has had a background of experience in audio work that few recordists of his age can match.



This home-made professional-type disc recorder set-up in Bill Day's sound studio, is a far cry from his early experimental models. It is the cumulative result of more than 12 years of experience in building constantly improved sound recorders — and is worth more to Bill than the most costly professional machines obtainable.

Cornell Tape Recording Center

(*Continued from Page* 1, *Col.* 1)

"We aren't trying to build an archive," Kaiser points out. "We plan to keep only those titles for which there is the most demand. As quickly as people stop requesting a program, we will replace it."

Adding to the library is a very continuous process. The basic end of the recorded material is changeless factual information which will be supplemented as soon as new, fresh material becomes available. Recordings of famous speeches and descriptions of notable events will be included for as long as they are timely. At present they are available for New York State organizations and schools only.

All recordings are kept on master tapes at the Cornell Center. Audio Devices, Inc., of New York, is supplying the tape for this project through the cooperation of their local distributor, Stallman of Ithaca. Anyone wanting to use a program should send his own tape to the Center, along with his order for the particular program or programs desired. The material requested is quickly recorded on the subscriber's own tape, and this is returned to him. The master tapes never leave the Center.

"Tape recordings have at last given us a chance to overcome the objection that radio is not a permanent form of communication," says Professor Kaiser. "Now we can keep vital or important programs on tape for as long as people want to hear them."

Ted Richards says, "We would found a tape recording library so that any person can find instruction in any study."

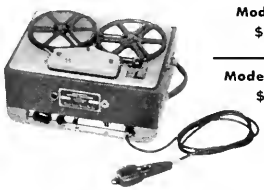
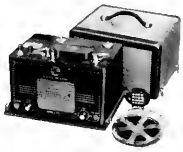
Mr. Richards picks out a recorded tape from the library files, to fill another request for a free copy of a worthwhile educational recording. Cornell's latest catalog, available free on request, lists about 450 educational recordings, classified under the subjects of General Information, Agriculture, and Home Economics.

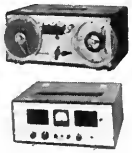
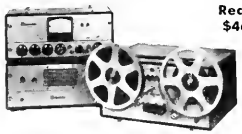
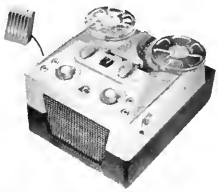
QUICK FACTS ON MAGNETIC TAPE RECORDERS

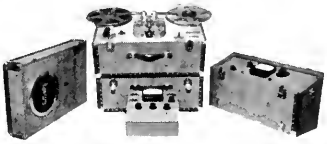
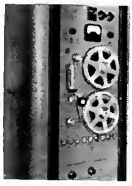
(Additional Information can be obtained by writing to the manufacturer)

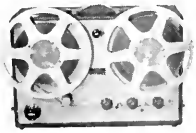
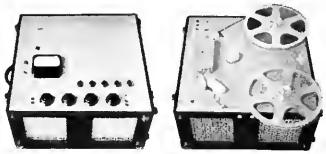
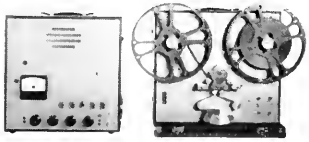
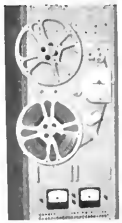
Manufacturer	Model and Price	Frequency Response	Data	Tape
AMPEX ELECTRIC CORPORATION Howard Ave. at Laurel, San Carlos, California	 **Portable Model 400** **$925.00**	**50-15,000 cycles (±2 db) at 15"/sec.** **70-10,000 cycles (±2 db) at 7½"/sec.**	Portable, dual-track recorder, with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, over 55 db at either speed. Either half-track or full-track recordings can be played back without changes in adjustment. Separate record and playback heads. Instantaneous starting. Rewind time, 1½ min. Simultaneous monitoring. Weight—approx. 75 lb.	**Wound with OXIDE IN**
	 **Console Model 300C** **$1,860.00**	**50-15,000 cycles (±2 db) at 15"/sec.**	Professional-type, single-track recorder, with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers. Rewind time, 1 min. for full NAB reel. Design flexibility permits modifications for special applications, including multi-channel recording and response beyond 80 KC. Custom built instrumentation machines available with response to 100 KC. Also available in portable and rack-type units.	**Red Oxide, Plastic Base Recommended**
AMPLIFIER CORPORATION OF AMERICA 396-398 Broadway, New York 13, N. Y.	 **"Twin-Trax Magnemuse" Model 810B (7½"/sec.) $285.00**	**50-9,000 cycles (±3 db) at 7½"/sec.**	Portable, dual-track recorder, with automatic reversal—giving up to 1 hour continuous play on 7" reel. Dynamic range, 45 db. Input channels for microphone and radio-phono. Total distortion, less than 3%. Shuttle speed in both directions. Weight—42 lb.	**Wound with OXIDE OUT** **Red or Black Oxide, Plastic or Paper Base**
	Model 810C (15"/sec.) $345.00	**30-13,000 cycles (±2 db) at 15"/sec.**		
	 **"Magnemaster Consolette" Model 815** **$395.00**	**50-15,000 cycles, at 15"/sec.** **50-10,000 cycles, at 7½"/sec.**	Single or dual-track recorder with tape speeds of 15 and 7½" per second. Separate heads for erase, record and monitor. Simultaneous monitoring while recording. Dynamic range, 50 db. Shuttle speed in both directions.	
	 **"Twin-Trax Magnerama" Model 910B** **$495.00**	**50-9,000 cycles (±3 db) at 7½" sec.**	Portable, dual-track recorder, with 7½" tape speed and automatic reversal—giving 4 hours continuous play on 13½" reel. Tape speed, 7½" per sec. Microphone included. Weight—55 lb. Other data same as for "Twin-Trax Magnemuse" above.	
AMPRO CORPORATION 2835 North Western Ave., Chicago 18, Ill.	 **"Ampro-Tape" Model 731** **$119.75**	**100-7,000 cycles, at 3¾"/sec.**	Portable, dual-track recorder with 3¾" tape speed—giving 2 hours playing time on 7" reel. Input channel for microphone, radio or phone connection. Rewind time, 4 min. for 7" reel. Includes microphone, 5"x7" PM speaker, and jack for external speaker or earphones. Weight—17 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
BELL SOUND SYSTEMS, INC. 555 Marion Rd., Columbus 7, Ohio	 **"RE-CORD-O-fone" Model RT-65-B** **$186.45**	**70-8,000 cycles (±3 db) at 7½" sec.**	Portable, dual-track recorder with tape speeds of 1⅞", 3¾" and 7½" per second. Rewind ratio 6 to 1. Includes crystal microphone, 6" PM speaker, inputs for microphone and radio-phono, and headphone monitoring jack. Weight—33 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**

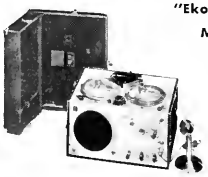
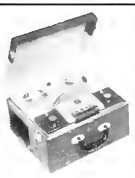
Manufacturer	Model and Price	Frequency Response	Data	Tape
BERLANT ASSOCIATES 4917 West Jefferson Blvd., Los Angeles 6, Cal.	"Concertone" Model 1401  $345.00	40-15,000 cycles (±2 db) at 15"/sec. 40-7,500 cycles (±2 db) at 7½"/sec.	Professional type single or dual track recorder mechanism and electrical chassis for console installation. Tape speeds, 15" and 7½" per sec. Signal-to-noise ratio, over 50 db. Fast forward and rewind time, 1 min. for 10½" reel. Separate record, erase, and playback heads. Monitors while recording. Carrying case and console available. Weight—50 lb., in case, with 8" speaker.	Wound with OXIDE IN Red Oxide, Plastic Base
THE BRUSH DEVELOPMENT CO. 3405 Perkins Ave., Cleveland 4, Ohio	 "Soundmirror" Model BK-443P $279.50 Model BK-443PS $289.50	To 7,000 cycles, at 7½"/sec. To 4,000 cycles, at 3¾"/sec.	Portable, single-track unit, available with 7½ or 3¾" tape speeds—providing 30 to 60 minutes recording time. Signal-to-noise, over 40 db, Wow and flutter, less than 0.3% RMS. Fast forward and rewind, 75"/sec. Inputs for microphone, radio-phono. Output, 5 ohms, 33 dbm. Includes 6" PM speaker and crystal microphone. Weight—32 lb.	Wound with OXIDE IN
	 "Soundmirror" Model BK-442 $259.50 (mahogany) $269.50 (blond)	To 7,000 cycles, at 7½"/sec.	Table model, single-track units with 7½" tape speed—providing 30 minutes recording time on 7" reel. Signal-to-noise, over 40 db. Wow and flutter, less than 0.3% RMS. Fast forward and rewind, 75"/sec. Inputs for microphone, radio-phono. Output, 5 ohms, 33 dbm. Includes 8" PM speaker and crystal microphone. Weight—33 lb.	Red Oxide, Plastic or Paper Base
CALIFONE CORPORATION 1041 North Sycamore Ave., Hollywood 38, Cal.	 "Dynacord" Portable Model C3-C3A $795.00	50-15,000 cycles (±2db) at 15"/sec. 50-7,500 cycles (±2db) at 7½"/sec.	Portable, single-track, dual-speed recorder designed to NAB Standards. Unique features include direct capstan drive from special slow-speed synchronous motor which eliminates flutter, and clutch-free dynamic braking of tape reels. Signal-to-noise ratio, over 50 db. Fast forward and rewind, 48 sec. for 10½" reel. Three separate heads permit monitoring from tape while recording. Includes VU meter, 2-speed equalization, and separate record and monitor gain controls. Weight—44 lb. for C3 transport mechanism; 33 lb. for C3A amplifier.	Wound with OXIDE OUT Red Oxide, Plastic Base
CRESTWOOD RECORDER CORP. 221 North LaSalle St. Chicago 1, Ill.	 "Magictape" Model CP-201F $229.50	50-8,000 cycles, at 7½"/sec.	Portable, dual-track recorder with 7½" tape speed. Rewind time, less than 2 min. Microphone and radio-phono input channels. Includes crystal microphone and 6"x9" speaker. Has fast forward time of 1 min. 20 sec. for 7" reel. Weight—29 lb.	Wound with OXIDE OUT Red Oxide, Plastic Base
EICOR, INC. 1501 West Congress St., Chicago 7, Ill.	 Portable Model 115 $144.95	80-7,500 cycles, at 7½"/sec.	Portable, dual-track recorder with tape speed of 7½" per sec. Removable capstan permits conversion to 3¾" per sec. Rewind speed, 6 to 1. Crystal microphone and speaker included. Weight—27 lb.	Wound with OXIDE IN Black Oxide Paper Base or Red Oxide Plastic Base
THE GENERAL INDUSTRIES COMPANY Elyria, Ohio	Tape-Disc Recorder Assembly Model 250 $79.50 	(depends on amplifier used)	Combined disc and tape recorder assembly for installation in console or portable case. Tape speed, 3¾"/sec., dual track. Fast forward and reverse. PM erase. Takes 5" reels. Disc recorder cuts and plays back up to 10" discs, at 78 rpm. Records from tape to disc and vice versa — and from microphone or radio to disc or tape.	Wound with OXIDE IN Red or Black Oxide, Plastic or Paper Base

Manufacturer	Model and Price	Frequency Response	Data	Tape
FAIRCHILD RECORDING EQUIPMENT CORP. 154th St. and 7th Ave., Whitestone, N. Y.	 **Console Model Unit 125** **$2,750.00**	**50-15,000 cycles (±1 db) at 15"/sec.**	Professional type, single-track recorder with 15" tape speed (7½" and 30" models available). Total noise and distortion −64 db (ref. 2½% dist.). Adjustable bias. Speed tolerance, 0.1%. Built-in VU meter and circuit checking. Unit-type, plug-in chassis. Automatic stop — instant braking and reversal. Push-button control of all functions.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	Console Model "PIC-SYNC" **$4,000.00**	**50-15,000 cycles (±1 db) at 15"/sec.**	Same as model 125 with the addition of lip synchronous operation. Used with motion picture camera and film projector, synchronous sound tracks are made and played back on ¼" tape, with no interconnecting equipment. Automatic Framing, which assures correct cueing of tape and film, available at additional cost. Other applications include Facsimile recording and telemetering, with frequency response possible above 80 KC.	
	 **Control Track Generator Model 140** **$335.00**		Portable light weight unit for "On Location" picture synchronous track recording on ¼" tape. Used with any portable tape recorder with 15"/sec. tape speed and frequency response good to 14 KC., a control track is simultaneously applied which later becomes the tape speed control when played back on Pic-Sync recorder.	
MAGNETIC RECORDING INDUSTRIES LTD. 30 Broad St., New York 4, N. Y.	**Model VM-55** **$289.50**	**To 4,000 cycles (2, 3.75, 7.5, or 15" per sec.)**	Portable, single-track recorders for a wide range of office and conference dictation and transcription work. Models VM-55 and VM-56 have choice of 4 tape speeds, by pulley substitution, providing up to 2 hours continuous recording on 7" reel. The VM-56-SS, with 1" per sec. tape speed, provides 4 hours continuous recording on 7" reel. Fast forward and rewind ratio, 40 to 1. Correct-O-Matic feature for automatic corrections. Split-A-Word instantaneous stop-start, actuated by microphone button or transcribing foot switch. Weight—19½ lb. for VM-55, 24½ lb. for VM-56 and VM-56-SS. Complete line of dictating and transcribing accessories available.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
	 **Model VM-56** **$345.00**	**To 9,000 cycles (2, 3.75, 7.5, or 15" per sec.)**		
	Model VM-56-SS **$395.00**	**To 3,000 cycles (1" per sec.)**		
MARK SIMPSON MFG. CO. INC. 32-28 49th St., Long Island City 3, N. Y.	 **"MASCO" Model LD-37** **$221.40** **Model LD-37R (with radio)** **$264.60**	**80-8,500 cycles (±3 db) at 7½"/sec.** **80-5,000 cycles (±3 db) at 3¾"/sec.**	Portable, dual-track, dual-speed recorders, arranged for instant change from 7½ to 3¾" per sec. Up to 2 hours recording time available on 7" reel. Signal-to-noise ratio, 45 db at 7½". Automatic equalization. Neon recording level indicator, volume and tone control, monitor switch, 6" PM speaker, and microphone. AC erase and bias. Microphone and radio-phono inputs. External speaker and amplifier outputs. Available with or without built-in AM tuner. Weight of mechanism (less case), 28 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	 **"MASCO" Model DC-37** **$243.00** **Model DC-37R (with radio)** **$286.00**		Models LD-37 and 37R, without carrying case.	
	 **"MASCO" Model D-37** **$243.00** **Model D-37R (with radio)** **$286.00**		Models D-37 and 37R, with two-tone tweed carrying case. Models DC-37 and 37R have metal cover with carrying handle. Cover operates interlock switch and can be locked with key.	
OPERADIO MFG. CO. St. Charles, Ill.	 **"Du-Kane" Portable** **$229.50**	**50-8,000 cycles, at 7½"/sec.**	Portable, dual-track recorder with 7½" tape speed. Power output, 7 watts. Input channels for microphone and radio-phono. Output jacks for headphones and external speaker. Fast forward speed, 150"/sec. Rewind time, 80 seconds for 7" reel. Microphone and built-in 6"x9" speaker included. Weight—26 lb.	**Wound with OXIDE OUT** **Red Oxide, Plastic or Paper Base**

Manufacturer	Model and Price	Frequency Response	Data	Tape
MAGNECORD INC. 360 North Michigan Ave., Chicago 1, Ill.	**Model PT6-J Amplifier $300.00** **Model PT6-A Recorder $248.00** 	**50-15,000 cycles (±2 db) at 15"/sec.**	Portable, single-track recorder, with interchangeable capstans for 15 and 7½" tape speeds. Two separate heads. Combination record/playback amplifier. Low impedance mike input, bridging input, monitor speaker, O-level output terminal, VU meter, terminal for external speaker.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	 **Model PT63-A Recorder $334.00** **Model PT63-J Amplifier $387.00**	**50-15,000 cycles (±2 db) at 15"/sec.**	Same as above, except with three separate heads for erase, record, and playback for monitoring from tape while recording. PT63-J amplifier has separate record and playback amplifiers, and switch for equalization at 7½ and 15" tape speed.	
	Model PT7-P Amplifier — $440.00 **Model PT7-A Recorder $468.00** 	**50-15,000 cycles (±2 db) at 15"/sec.**	Portable, single-track recorder, with 15 and 7½" tape speeds. Three separate heads. Safety-interlocked push button controls. Signal-to-noise ratio, over 55 db. Separate record and playback amplifiers—equalization at both speeds. Three microphone inputs and bridging input. Includes VU meter, monitor speaker, and output for external speaker.	
	 **Console Model PT7-CC $950.00** **Consolette Model $889.00** 	**50-15,000 cycles (±2 db) at 15"/sec.**	Complete console combination including PT7 recorder (as above) and PT7-C line-level amplifier. Separate record and playback amplifiers. Headphone jack. Switch for 7½ and 15" equalization. Switch for record, playback or bias reading on 4" VU meter. Black enamel finish with burn-proof Formica top and chrome trim.	
THE PENTRON CORP. Chicago 16, Ill.	**Portable Model 9T3-C $179.50** 	**50-8,000 cycles, at 7½"/sec.** **50-5,000 cycles, at 3¾"/sec.**	Portable, dual-track, dual-speed unit (7½" and 3¾")—providing 2 hours recording on 7" reel. Signal-to-noise ratio, 50 db. Flutter less than 0.5%. Fast forward and rewind ratio, 20 to 1. Inputs for microphone and radio-phono. Outputs for headphones, external speaker, and PA system. Includes 6" PM speaker and crystal microphone. Weight —27 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
PERMOFLUX CORPORATION 4900 West Grand Ave., Chicago 39, Ill.	 **Permoflux Scribe Dictating Unit $354.50**	**Ample for all voice recording**	Compact magnetic tape recorder designed for office dictation service. Same recorder, with different accessories, serves as either a dictating or transcribing unit. Dictating unit includes microphone with control switch. Transcribing unit includes single earphone and dual foot control. Simple "cartridge" loading eliminates threading. Tape speed, 3¾" per sec. Recording time, ½ hour per magazine. Includes provision for card indexing of corrections, extra carbons, length, rush, etc. Available accessories include: carrying case, telephone pick-up, magazine packet, tape mailing envelopes, dual foot control, single or double earphones, paddle-type or conference "mike," microphone adapter, external speaker and extra tape magazines.	**Wound with OXIDE IN** **Red Oxide, Paper or Plastic Base**
	 **Permoflux Scribe Transcribing Unit $361.30**			

Manufacturer	Model and Price	Frequency Response	Data	Tape
PRESTO RECORDING CORP. P. O. Box 500, Hackensack, N. J.	 RC-7 Transport Mechanism $425.00 A-920 Amplifier 324.00	To 15,000 cycles, at 15"/sec.	Professional type equipment for portable or stationary use. Tape transport mechanism has true three-motor drive and separate recording and reproducing heads. Instantaneous monitoring from tape is provided. Input for single microphone or high impedance bridging. Output, 10 watts. Also zero level line. Two speakers are mounted in amplifier for playback. Monitoring output for 'phones.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
	 Model RC-10-14 $684.00 Model RC-10-24 $761.00	To 15,000 cycles, at 15"/sec.	Professional, single-channel, dual-speed recorders (15" and 7½"/sec.) for rack mounting. Three separate heads, permitting monitoring from tape while recording. Three-motor drive mechanism. Fast forward and reverse. RC-10-14 controlled by rotary type selector switch. RC-10-24 completely push-button controlled. Can be arranged for remote operation.	
	 Console Model SR-950 $2,785.00	50-15,000 cycles (±1 db) at 15"/sec.	Professional, single-channel recorder, with 15 and 7½" tape speeds (15" and 30" optional). Signal-to-noise ratio, over 58 db below max. signal. Fast forward and reverse, 240 ft./sec. Three separate heads. VU meter. Amplifier and power supply units on hinged panel.	
RANGERTONE INC. 73 Winthrop St., Newark 4, N. J.	Portable Model R-5P (Less pre-amp) $2,618.00 	45-15,000 cycles (±2 db) at 15"/sec. 50-8,000 cycles (±2 db) at 7½"/sec.	Professional-type, single-track, dual-speed recorders, with choice of 3¾", 7½", 15" or 30" per second tape speeds. Up to 2 hours recording at 7½" per sec. on 14" reel. Distortion, less than 2% total harmonic. Maximum signal-to-tape noise, 55 db. Double-puck, tight-loop tape drive. Peak-to-peak flutter, less than 0.1% at 15"/sec. Rewind speed controllable continuously from 0 to 250"/sec. in both forward and rewind. Meets all N.A.B. adopted standards. Complete monitoring and mixing facilities. VU meter, signal indicator and footage counter calibrated in minutes and seconds. Complete tape editing facilities. Also available with positive "sprocketless" synchronization for motion picture and TV applications. Weight of portable model—drive unit 85 lb. playback amplifier 52 lb., record amplifier 37 lb.	Wound with OXIDE IN Red or Black Oxide, Plastic Base
	 Console Model R-5C (Less MP synchronizer) $3,117.00	45-15,000 cycles (±2 db) at 15"/sec. 50-8,000 cycles (±2 db) at 7½"/sec.		
RCA BROADCAST EQUIPMENT SECTION Camden, N. J.	 Cabinet Rack Model RT-11A $1,975	50-15,000 cycles (±2 db) at 15"/sec.	Single-track, dual-speed professional type recorder, available in cabinet rack or console mounting. Separate erase, record and playback heads permit simultaneous recording and monitoring. Distortion, less than 1% at 10 db below maximum level. Signal-to-noise, 60 db below maximum level. Wow and flutter, 0.1% at 15" per sec. Fast forward and rewind time, 60 sec. for 2400 ft. reel. Timing accuracy, ±2½ sec. for 30 minute run. Instant stop and start (within 1/10 sec.). All control functions push-button controlled. Remote push-button control also available.	Wound with OXIDE IN Red Oxide, Plastic Base
	 Console Model RT-12A $2,270	50-5,000 cycles (±2 db) at 7½"/sec.		

Manufacturer	Model and Price	Frequency Response	Data	Tape
REVERE CAMERA CO. 320 East 21st St., Chicago 16, Ill.	 **Model T-100** **1 Hour Play** **$169.50** **Model T-200** **1 Hour Play** **(with radio)** **$209.50**	**To 7,500 cycles (±3 db) at 3¾"/sec.**	Portable dual-track recorder available with either 3¾" or 1⅞" tape speed, providing 1 or 2 hours recording time on a 5" reel. Signal-to-noise ratio, over 50 db on 2-hour machine. Rewind speed, 102½"/sec. Fast forward, 371½"/sec. Flutter, less than 0.35%. Two-level neon recording indicator. Instant start and stop lever for editing, etc. Outputs for external speaker or headphones. Microphone and 5"x7" PM speaker included. Weight—25 lb.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic or Paper Base**
	Model T-500 **2 Hour Play** **$179.50** **Model T-600** **2 Hour Play** **(with radio)** **$219.50**	**To 5,000 cyles (±3 db) at 1⅞"/sec.**		
SONAR RADIO CORP. 59 Myrtle Ave., Brooklyn 1, N. Y.	 **Model PTM** **Transport Mechanism** **$229.90** **Model RPA-1** **Amplifier** **$190.00**	**30-10,000 cycles (±2¾ db) at 7½"/sec.**	Portable, single-channel recorder with 7½" tape speed. Signal-to-noise ratio, 50 db or more. Total harmonic distortion, less than 2%. Wow and flutter, 0.25%. Fast forward and reverse, 58 sec. for 2,500 foot reel. Three separate heads. Playback timing, ±0.3% for 33 min. program. Includes RF filter, 40-step attenuator, VU meter and RC equalizers. Equipment can also be console or rack mounted.	**Wound with OXIDE IN** **Red Oxide Plastic Base**
THE STANCIL-HOFFMAN CORP. 1016 North Highland Ave., Hollywood 38, Cal.	 **"Minitape"** **Model M5A** **$249.00**	**100-5,500 cycles (±2 db) at 7½" or 15"** **100-4,000 cycles (±2 db) at 3¾"/sec.**	Portable, single-track recorder with tape speeds of 3¾, 7½ and 15" per sec. Signal-to-noise ratio, at least 35 db. Completely self-contained battery operated unit (recording only). Weight—13 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	Model R4 **$1,670.00** 	**50-15,000 cycles (±1 db) at 15"/sec.**	Portable, professional-type, single-track recorder with tape speeds of 7½ and 15" (or 15 and 30") per sec. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers with independent monitor amplifier and speaker.	
	 **Model 55** **Synchronous Magnetic Film Recorder and Reproducer** **$2,142.00**	**45-7,500 cycles (±2 db) 16mm** **45-15,000 cycles (±2 db) 17½mm**	Synchronous magnetic film equipment for motion picture and TV sound recording. Includes proper speed and equalization for both 16mm and 17.5mm film width. Full synchronous sprocket drive arranged for forward or reverse recording or playback. Also fast forward and reverse for editing. Gearless drive. Signal-to-noise, at least 50 db. Max. harmonic distortion, 1.5% from full level. Playing time; up to 1 hr. for 16mm, up to 24 min. for 17.5mm. 2,000-ft. reel capacity.	**Uses Magnetically Coated 16mm and 17.5mm Film**
	 **Model CRM-15** **Multi-Channel Communications Recorder** **(Prices on Request)**	**200-7,500 cycles (±3 db) at 7½"/sec.** **200-3,500 cycles (±3 db) at 3¾"/sec.**	Provides up to 15 simultaneous recording channels on 0.7" wide tape. Recording time, up to 4½ hours for 1,000 foot reel. Two units, with automatic sequence control permit continuous, 24-hour recording. Signal-to-noise, at least 40 db. Distortion, not more than 5% total harmonic at "0" input level. Negligible crosstalk between channels. Push-button control. Fast forward and rewind. Automatic stop.	**Uses Special 0.7" Plastic or Paper Base Tape**

Manufacturer	Model and Price	Frequency Response	Data	Tape
UNIVERSAL ELECTRONICS SALES CORP. 1500 Walnut St., Philadelphia 2, Pa.	 "Reelest" Model C-1-A $219.00	70-8,000 cycles (±3 db) at 7½"/sec.	Portable, dual-track recorder with 7½" tape speed and automatic reversal, giving 1 hour continuous play on 7" reel. Signal-to-hiss, 60 db. Signal-to-hum, 50 db. Fast forward and rewind. Electronic recording level indicator. Inputs for microphone, phono and radio. Output for external speaker or PA system. Weight—34 lb.	Wound with OXIDE OUT Red Oxide, Plastic Base
WEBSTER CHICAGO CORPORATION 5610 Bloomingdale Ave., Chicago 39, Ill.	 Web-Car Portable Model 210 $187.50	70-7,500 cycles at 7½"/sec. 70-4,000 cycles at 3¾"/sec.	Portable, dual-track recorder with tape speeds of 3¾" and 7½" per sec. Gives up 2 hours recording on 7" reel. Records or plays in both directions without reel turnover. Fast forward and rewind. Two recording heads and two motors. Signal-to-noise, 35 db. Amplifier automatically equalized for both speeds. Includes electronic eye volume level indicator, 6" PM speaker and microphone. Weight—38 lb.	Wound with OXIDE IN Red or Black Oxide, Plastic Base
WEBSTER ELECTRIC CO. Racine, Wisc.	 "Ekotape" Model 109 $169.50 Model 111 $169.50	60-4,000 cycles, at 3¾" sec. 60-7,000 cycles at 7½" sec.	Portable, dual-track recorders with 3¾" or 7½" tape speed—giving 2 or 1 hour recording time respectively on 7" reel. Fast forward and rewind, 75" per sec. Neon recording level indicator. Input jacks for microphone and radio-phono. Output jack for external speaker. Includes 5"x7" PM speaker and crystal microphone. Weight—34 lb.	Wound with OXIDE IN Red or Black Oxide, Plastic or Paper Base
	 "Ekotape" Portable Model 101-8 $369.50 Model 101-9 $395.00	40-8,000 cycles, at 7½" sec.	Portable, single-track recorder with 7½" tape speed. Fast forward and rewind, 75" per sec. Electronic eye recording level indicator. Inputs for microphone and radio-phono. Output for external speaker. Includes 8" PM speaker. Weight—50 lb. Model 101-8 includes crystal microphone. Model 101-9 includes receptacle for connecting a remote control foot switch.	
WILCOX-GAY CORP. Charlotte, Mich.	 "Recordio" Model 1B10 $149.95	85-6,000 cycles, at 1.875" sec.	Portable, dual-track unit giving 2 hours recording on 5" reel. Includes phonograph turntable and pick-up for recording from disc to tape. Rewind time 1½ min. for 5" reel. Jack for external speaker. Recording level indicator. Includes 6" oval speaker and crystal microphone. Weight —21 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
	 "Recordio" Model 1C10 $187.50	65-8,500 cycles, at 3¾"/sec.	Portable, single-track unit giving 1 hour recording on 5" reel. Includes disc recorder and reproducer. Records from tape to disc and vice versa, and from microphone or radio-phono to disc or tape. Fast forward and reverse. Automatic stop. Recording level indicator. Jack for external speaker. Includes 5"x7" oval speaker and microphone. Weight —27 lb.	
	 "Recordio" Model 2A-10 $149.95	85-10,000 cycles at 7½"/sec.	Portable, single-track, dual-speed recorder with choice of 3¾" and 7½" or 1⅞" and 3¾" tape speeds. Finger-tip push-button control. No separate amplifier switch; record button shifts amplifier and erase head. No clutches. Records from mike, external radio or other source. Fast forward and reverse. Neon recording volume indicator. Includes 5"x7" speaker and jack for external speaker. Weight, under 20 lb.	

NOTE: All prices listed are subject to change without notice. Consult manufacturer or local dealer for exact price, as some prices are list and others net.

Manufacturer	Model and Price	Frequency Response	Data	Tape
MACON ELECTRONICS **Division of York Radio and Television Corp., 801 N. Broadway, Decatur, Ill.**	**"Musictape" Portable**  **$199.50**	**50-7,000 cycles, at 3¾"/sec.**	Portable combination tape and disc recorder, with 3¾" tape speed (dual track) and 78 rpm disc speed. Records from tape to disc or vice versa. Also records from microphone, external radio or phono to either disc or tape. Simple push-button control of all functions. Includes automatic erase, neon recording level indicator, fast forward and rewind, 5" x 7" speaker, crystal microphone. Weight —32 lb.	**Wound with OXIDE IN Red Oxide, Plastic Base**

RECORDING TIME
For Various Tape Speeds and Reel Sizes

REEL SIZE		3"	4"	5"	7"	10½"	14"
LENGTH IN FEET Audiotape Other Types		150 150	300 300	600 600	1250 1200	2500 2400	5000 4800
RECORDING SPEED		TOTAL RECORDING TIME (Based on Audiotape footage)					
1⅞" per sec.	Single Track Dual Track	16 min. 32 min.	32 min. 1 hr. 4 min.	1 hr. 4 min. 2 hr. 8 min.	2 hr. 13 min. 4 hr. 26 min.	4 hr. 26 min. 8 hr. 52 min.	8 hr. 52 min. 17 hr. 44 min.
3¾" per sec.	Single Track Dual Track	8 min. 16 min.	16 min. 32 min.	32 min. 1 hr. 4 min.	1 hr. 6½ min. 2 hr. 13 min.	2 hr. 13 min. 4 hr. 26 min.	4 hr. 26 min. 8 hr. 52 min.
7½" per sec.	Single Track Dual Track	4 min. 8 min.	8 min. 16 min.	16 min. 32 min.	33⅓ min. 1 hr. 6½ min.	1 hr. 6½ min. 2 hr. 13 min.	2 hr. 13 min. 4 hr. 26 min.
15" per sec.	Single Track Dual Track	2 min. 4 min.	4 min. 8 min.	8 min. 16 min.	16½ min. 33⅓ min.	33⅓ min. 1 hr. 6½ min.	1 hr. 6½ min. 2 hr. 13 min.
30" per sec.	Single Track Dual Track	1 min. 2 min.	2 min. 4 min.	4 min. 8 min.	8¼ min. 16½ min.	16½ min. 33⅓ min.	33⅓ min. 1 hr. 6½ min.

AUDIOTAPE DATA

Length	Reel	Coating	PLASTIC BASE			PAPER BASE		
			Type No.		List Price	Type No.		List Price
			Oxide Out	Oxide In		Oxide Out	Oxide In	
150 ft.	3" Plastic	Red Oxide	150	151	$0.85	120	121	$0.70
300 ft.	4" Plastic	Red Oxide	350	351	1.60	320	321	1.25
600 ft.	5" Plastic	Black Oxide Red Oxide	640 650	641 651	3.50 3.50	600 620	601 621	2.25 2.25
1250 ft.	7" Plastic (or aluminum)	Black Oxide Red Oxide	1240 1250	1241 1251	5.50 5.50	1200 1220	1201 1221	3.50 3.50
2500 ft.	Std. N.A.B. Aluminum Hub Complete 10½" Alum. Reel	Red Oxide Red Oxide	2550H 2550R	2551H 2551R	10.00 12.85	2520H 2520R	2521H 2521R	6.50 9.35
5000 ft.	Std. N.A.B. Aluminum Hub Complete 14" Alum. Reel	Red Oxide Red Oxide	5050H 5050R	5051H 5051R	20.00 26.00	5020H 5020R	5021H 5021R	13.00 19.00

AUDIOFILM, is also available in 16 mm, 17½ mm and 35 mm sizes, for spracket-type synchronizatian af separately recorded sound in motion picture and TV applications. The magnetic oxide coating is applied on the same base material as standard matian picture film, with conventional sprocket holes. Prices and data an request.

by C. J. LeBel, Vice President, Audio Devices, Inc.

TAPE RECORDER TRENDS

C. J. LeBel

Another year has rolled around, and with it another Quick Facts issue appears. Reading about so many machines all at once is an excellent way to see the trend of the industry, so we will take a few columns to discuss what we found.

Wider Frequency Range

Some years ago it was considered that the best designs would produce a frequency range of 1000 cps per inch per second of tape speed. The present relationship seems to be at least 2000 cps per inch of tape speed, and a few designs approach 4000 cps per inch of tape speed. The economy of tape use which this permits is obvious, though in the more extreme cases it is purchased at the expense of signal-to-noise ratio. Where the latter is important, as in professional equipment, 2000 cps per inch per second seems the limit.

Simple Operation

There seems to be a definite trend toward more simple operation, particularly on home machines. We have one knob control where we often used to have two knobs, or a gearshift. This is all to the good if it encourages wider home use as it surely will.

Three Heads

There are rather more professional machines, even in the low cost class, with provision for monitoring off the tape while recording. This is the three head design, with separate recording and reproducing heads. We like this trend for two reasons: First, because monitoring off the tape is good insurance against lost takes; and second, for better quality. The design considerations for recording and reproducing heads are by no means alike and combining both functions in one unit leads to a compromise which is good but still a compromise. With the trend to lower tape speed, such compromise will become less and less desirable.

Lower Cost Professional Machines

It is good to see considerable attention given to professional machines in the $400 to $750 class. Not only does this help the broadcaster, but the school will find it useful. Much school recording can be done only with machines of full professional quality, and this price class fits well within the average school budget.

Many broadcasters with studio equipment in the $1500 to $3000 class like to use lower cost truly portable machines for their remote work. Home machines are seldom really adequate for broadcast quality, and we are glad to see more equipment in the most popular price class.

Sprocket Hole Magnetic Film

Judging by sales figures on Audiofilm, the motion picture industry has found magnetic film very useful, and so we welcome the advent of more light portable machines. For location work, particularly, they will reduce costs amazingly.

There has been considerable discussion of the comparative virtues of sprocket hole magnetic film and of standard quarter inch Audiotape with synchronizing track for motion picture recording. Since our sales to proponents of both methods have been large, we cannot say that either method has defeated the other. Each seems to have its place.

Business Machines

Judging by improvements in present machines, and advent of new manufacturers, tape has come to stay in the dictating machine field. We are glad to see this, for we have always felt that tape offered many advantages over wire in business work.

Not Overlooked

While they are not listed, we have not overlooked the airport recorder and the digital computer. Both use wide tape for multi-channel work, and both seem to have a good future. Perhaps the next addition of Quick Facts may show several of each type. Telemetering is another multi-channel field which is moving rapidly ahead. We see that the upper frequency limit in telemetering recording has been pushed up to 100 kc — surely a far cry from the 15 kc limit of the first professional recorders.

HAVE YOU SEEN THE NEW AUDIOTAPE SOUND MOVIE YET?

This educational film, in full color, is now quickly available for free showings to all interested groups

When the new 16mm sound moving picture on the manufacture of Audiotape was first announced (Audio Record, February 1951) the requests for copies far exceeded our expectations — and our supply of prints. As a result, many showing had to be booked pretty far in advance. Since then we have obtained an additional supply of these films and copies can now be obtained without delay for free showings to all interested groups and organizations.

Several hundred showings of the new Audiotape film have already been made — to a wide variety of audiences, ranging from professional recording engineers to school students and amateur recordists. Judging from the reports which are continually pouring in, the film is a huge success. Audiences and sponsoring organizations have commented very favorably on the educational value of the film — its excellence of color and photography — and the fidelity of the sound reproduction (original sound recorded on Audiotape, of course).

For the benefit of those who might have missed the original announcement, here's what it's all about. The full-color, 16mm sound film, entitled "Audiotape Speaks for Itself", takes you on a personally guided tour through the modern plant where Audiotape is made. You see actual laboratory demonstrations of how the magnetic oxide is formed — dried — ground — mixed — and applied to test samples on miniature, pilot plant equipment. After the test samples are carefully checked for physical and magnetic properties, the ingredients tested are released for production use. Then you are taken out into the plant itself, to see Audiotape actually being made — batch mixing, ball milling, coating, monitoring, slitting, production testing, and packaging for shipment.

We believe that this new film will give a much better understanding of *how* and *why* Audiotape has achieved the recognized superiority that has made it the first choice of so many professional recordists. It shows how the extra care and precision in formulating and applying the coating produces a magnetic recording tape that is unequalled in fidelity of reproduction and uniformity of output.

Prints of the 16mm sound film will be loaned without charge to interested recordists and educational institutions. Requests should be mailed to Audio Devices, Inc., 444 Madison Avenue, New York 22, N. Y.

Audio Devices offers $25 plus 10 reels of Audiotape for *each* of the ten best articles on the use of sound recordings in educational work

Within the past few years, the use of sound recording in schools and colleges has grown by leaps and bounds. In fact its growth has been so rapid that we're frank to admit that our knowledge of the subject is far from complete. Naturally, we want to know more about it — for our own information and to help other educators to utilize the full potential of this new teaching tool.

Audio Devices is therefore offering cash awards of $25 — plus ten 1250-ft. reels of plastic-base Audiotape — for *each* of the ten best articles on the use of tape or disc recordings in educational work. In addition, 10 reels of Audiotape will be given for *all other* articles which are used, in whole or in part, for publication in Audio Record or in special literature prepared by Audio Devices for the educational field.

Since we want to gather this information as quickly as possible, the above offer will be limited to material post marked not later than December 15, 1951.

Here are a few suggestions that will help you prepare your entries in this contest.

1. Make the information as complete and detailed as possible, telling exactly *how* you are using recordings in any or all fields — such as music, drama, languages, speech correction, elocution, science, or what have you.
2. Explain how or why the use of recordings simplifies or improves the teaching technique over previously used methods.
3. Include specific data on the type of equipment used — recording speeds, quality requirements, etc.
4. Include, if possible, good photographs of the recording equipment *in use*.

The articles will be judged on the basis of the factual information which they contain, rather than on the literary merit of the text. Stories covering some of the more unusual applications in educational work will be particularly welcome.

Even if you have already contributed educational recording stories for Audio Record, don't hesitate to send in a new entry amplifying the same subject. The fact that we may already have part of your story will in no way detract from its consideration in judging the articles entered in this contest.

Articles submitted by teachers or other education personnel in Elementary Schools, High Schools, Colleges and Universities throughout the United States will be eligible for this educational recording contest. If you are engaged in any type of educational recording work (disc or tape), send in your story before Dec. 15, 1951. It may bring you $25 in cash — plus $55 worth of free Audiotape. And even if your article doesn't happen to get one of the ten first awards, you can still get the $55 worth of free Audiotape if your story is printed in Audio Record or any other material published by Audio Devices, Inc. Wouldn't this be worth a few minutes of your spare time?

All articles submitted become the property of Audio Devices, Inc., and no entries will be returned.

Entries should be addressed to Contest Editor, Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

12 Complete, Non-Royalty Radio Scripts Selected from Prize-Winning Entries in the Scholastic Magazines and AER National Script Writing Contests for 1951

Here's a timely answer to the need for good, non-royalty radio scripts suitable for educational or amateur recording or broadcasting. In Audioscripts 1951 you get a collection of twelve complete prize-winning radio scripts for *less than ten cents each*. These student-written scripts, selected from prize-winning entries in the Scholastic Magazines and AER Contests, cover a wide variety of subjects — original radio dramas, radio drama adaptation, and general radio scripts. Here's the list of contents for Audioscripts 1951:

ORIGINAL RADIO DRAMA
(Scholastic Magazines' Contest)

First Prize — THE END OF THE JOURNEY by William Galarno. Interesting highlights on the early life of Doctor Samuel Forrester.

Second Prize — EMERGENCY ASSIGNMENT, by Richard S. Reamer, Jr. Tense drama urging safety in teen-age driving.

Third Prize — THE EMERALD FLAME, by Thomas J. Walsh. An action-packed biblical drama.

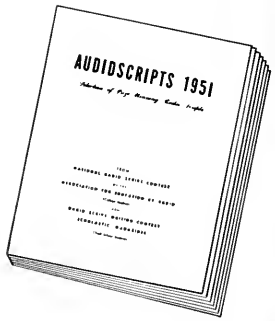
Fourth Prize — LEFTY, by Carmia Amato. A humorous story about a potential thief and his "conscience".

RADIO DRAMA ADAPTATION
(Scholastic Magazines' Contest)

Fourth Prize — GREAT EXPECTATIONS. A skilful condensation of the famous Dickens novel, adapted for radio by Edward J. Golden.

GENERAL RADIO SCRIPTS
(Scholastic Magazines' Contest)

First Prize — THE STARS POINT THE WAY, by Geraldine G. Heuermann. In which four famous radio personalities join the fight for better English in the schools.



Second Prize — THE FIRST PERFORMANCE OF HAMLET, by James D. Stasheff. An on-the-scene report of this famous stage premiere.

Third Prize — THE VISION, by Edward Q. Field, JR. A startlingly realistic alcoholic phantasmagoria.

Fourth Prize — JUNIOR'S FIRST TRAIN RIDE, by Nancy Rae Riley. A humorous episode about the antics of a very unruly youngster.

SCRIPTS FOR HOME AND SCHOOL RECORDING
(AER Contest)

First Prize — HISTORY IS MY BEAT, by Meric L. Legnini. A newspaper reporter covers the Boston Tea Party.

Second Prize — WHEN THEY COUNT THE AMERICAN DEAD, by William H. Robinson, Jr. Dramatization of the Boston Massacre and the death of Crispus Attux.

Third Prize — THE SCAR, by William A. Coffield. The story of how Andrew Jackson got the scar on his forehead.

As a service to educational radio, and as part of Audio's sponsorship of the Scholastic Magazines' and AER Contests, this valuable collection of radio scripts is offered at cost — $1.00 net each. Copies can be obtained by sending check or money order (no stamps please) to Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

Oct.-Nov. 1951, Vol. 4, No. 6

Published by
AUDIO DEVICES, INC.
444 MADISON AVENUE, N.Y.C.

audiodiscs
audiotape
audiofilm
audiopoints

Miss Joan T. Peterson of Ficker Recording Service, pulls out another request number from their 500-tape library. Note Audiodisc Chip Chaser at each of the four disc recorders below the tape shelves. Story on Pages 4 and 5.

In this issue

How UNIVERSAL Cuts Cost of TV Sound

Universal Recorders Adapts Radio Production Technique to Film — Saves Cost on Top Quality.

Universal Recorders, one of the most progressive studios in the world, using only the most modern equipment, has recently added new facilities to its headquarters at 6757 Hollywood Blvd. in Hollywood to help service its clientele in the field of television.

Universal is now geared to the new medium, using radio production techniques in adding sound to films made for teevee. It has pioneered the new approach in Hollywood. Because of excessive costs involved, television production has to adopt a middle road between motion picture and radio technique. As the head of the sound department of a major motion picture studio said recently at a luncheon during which he addressed TV packagers: "Sound recording for a feature film on 35mm film costs about $5600 for raw stock and processing, for each full length picture. The same thing can be achieved on ¼ inch tape, with all editing done on tape for *under* $800. Moreover, the additional savings on labor is terrific."

Using Rangertone ¼ inch lip synchronization tape recorder, Universal is well in front of others in the use of tape. Will Voeller, president of Universal Recorders, and Arthur Hogan, chairman of the board, estimate they can save motion picture producers up to 70% of the cost of sound on film. The new method not only saves money but is an infinite time-saver.

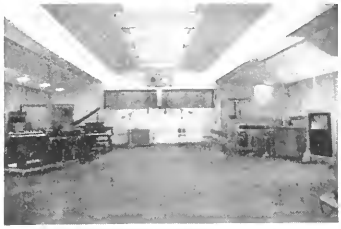
"Television cannot afford to cut the costs of good properties for dramatization. It cannot carp on the price of good actors and good technical and creative talent. It must save on the technique of production," says Voeller. "Television producers have to give top quality on an economic price level, and we can now give it to them."

Most motion picture producers are trying to continue with the same methods they have used in the past twenty years. They have refused to recognize the great advances made by radio. It is possible to save an inestimable amount of raw stock with the use of tape. For instance, suppose a producer of motion pictures has a director who needs ten, twenty, or thirty "takes" for the scene he means to use. All the sound recorded on film is ruined on the "out takes", and the raw stock cannot be used again. On tape, he can pick his best scene (or several scenes) of the thirty and wipe out the rest using that tape over and over again. Moreover, if he is on location, instead of waiting days to have the raw stock processed, on tape he can hear the results immediately.

For puppet shows made for television, producers can record, say, ten programs in one day and film to the sound at their convenience. It obviates the cost of having sound men and their equipment on the stages for days during filming. It is the cheapest and only method.

For short films, such as those used in commercials, it is possible to film days of sequences "silent" and then project the image on a screen at Universal, with the actors reading the lines to the screen.

Engineers DeWitt Morris and Andrew Richardson, of Universal Recorders, checking a program on a Rangertone ¼" tape recorder and Stancil-Hoffman 17½ mm synchronous magnetic film recorder and reproducer.



Universal Recorders studios are as complete and up to the minute as any in the world. Studio above measures 36' by 46', can accommodate up to a 35 piece orchestra.

This leaves capable sound men free to creative activities rather than to mechanical duties.

Universal Recorders now has perfect sync, adopting the radio technique of cueing in on ¼ inch tape all dialogue, sound effects, special effects, and background music.

They also use 17½mm magnetic film, inscribing a visual track next to the magnetic track in a technique called "modulation writing".

Among the producers using Universal

(*Continued on Page 3, Col. 1*)

Signing contracts for series of air shows produced by Universal Recorders for the U. S. Marine Corps, are director Frank Danzig, Chairman of the Board Athur Hogan (seated), Lt. Jack Sorensen, Patti Clayton, and orchestra leader Jerry Gray.

audio record
VOL. 7, NO. 8 OCT.-NOV., 1951

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Universal Cuts Cost —

(*Continued from Page 2, Col. 3*)

Recorders facilities are: George Carillon, Eddie Bracken Productions, Consolidated TV, Tom Kelley, Rene Williams, Bob Baker, Churchill-Wexler.

Voeller believes that ultimately pictures will be recorded electronically on tape. When the process becomes practical, it will mean all sound as well as pictures will be recorded on tape. It will mean a simpler process, cheaper, and a more faithful reproduction of image and sound.

Recording sound for television is by no

which he received a Legion of Merit Award.

The entire staff of Universal Recorders is orientated and alerted to assist in each phase of recording. Working with hundreds of clients, they still devote personal attention to each order. The operation is complete from studio to shipment.

The company is unique in its field in that it has an employee profit sharing plan. This supplies additional incentive to the employees to see that customers are satisfied and works for the benefit of the client.

The entire operation is geared to precision and speed, and no assignment is too

AUDIO DEVICES, INC.
444 Madison Avenue
New York 22, N. Y.

To Our Readers:

We are pleased to place your name on the mailing list to receive the Audio Record, as you requested.

If you have some story on recording work, suitable for publication, we shall be glad to hear about it. Any questions on recording technique will also receive our prompt attention.

The Editor
Audio Record
444 Madison Avenue
New York 22, N. Y.

An engineer at Universal Recorders checks the depth of cut, the condition of the stylus and the distance between each groove through a microscope.

For the customer's protection, Universal recommends two original recordings for every important processing job; one to be filed in the library (shown above) which is controlled for proper temperature and humidity.

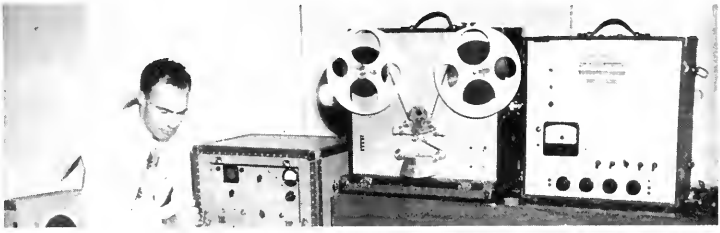
selections spliced together, as any desired portion can be more quickly spotted by noting the position of the splices on the reel before unwinding. The use of a grease pencil to mark the position of splices directly on the reel flange, also facilitates easy spotting of selections on a machine.

When a reel of plastic base tape is held up to the light, any splices will show up clearly as white "pips" of light, something like the dots on a radar screen. Incidentally, all plastic base Audiotape, in both 1250 and 2500 ft. sizes, is guaranteed to be *splice free*. See illustration on back cover.

How UNIVERSAL Cuts Cost of TV Sound

Universal Recorders Adapts Radio Production Technique to Film — Saves Cost on Top Quality.

Universal Recorders, one of the most progressive studios in the world, using only the most modern equipment, has recently added new facilities to its headquarters at 6757 Hollywood Blvd. in Hollywood to help service its clientele in the field of



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For short films, such as those used in commercials, it is possible to film days of sequences "silent" and then project the image on a screen at Universal, with the actors reading the lines to the screen.

ing in on 1/4 inch tape all dialogue, sound effects, special effects, and background music.

They also use 17.5mm magnetic film, inscribing a visual track next to the magnetic track in a technique called "modulation writing".

Among the producers using Universal

(*Continued on Page 3, Col. 1*)

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Voeller believes that ultimately pictures will be recorded electronically on tape. When the process becomes practical, it will mean all sound as well as pictures will be recorded on tape. It will mean a simpler process, cheaper, and a more faithful reproduction of image and sound.

Recording sound for television is by no means the only service accorded by Universal Recorders. Since its inception six years ago, Universal has grown to be one of the largest studios in the world. Streamlined to maximum efficiency and fastest service, it is devoted to making highest quality records. It services the government, motion pictures, radio, phonograph record, and transcription industries (as well as the religious field) with five, modern, air-conditioned Studios, a complete Recording Room, a large disc and tape library, and the finest audio, disc and magnetic tape equipment as well as all the lip-sync equipment and projection rooms mentioned before.

Chairman of the Board of Universal Recorders is Arthur B. Hogan, whose wide experience in the fields of finance and investment banking, equips him admirably for the position. Hogan became part owner of Universal in 1946 and bought out Wesley Dumm in 1950.

Will Voeller, president of Universal, has degrees as Doctor of Laws, Political Economy and Philosophy, was once executive assistant at Paramount Publix, was one of the leaders in developing foreign radio broadcasting for American manufacturers, was one of the pioneers in custom-built package shows and syndication of radio programs, was in the army from 1942 to 1945 working with Armed Forces Radio Service where he was responsible for developing a special system of distribution of radio programs among overseas radio stations and was instrumental in gearing the recording, processing, and pressing industry to the war-time demands of AFRS, for which he received a Legion of Merit Award.

The entire staff of Universal Recorders is orientated and alerted to assist in each phase of recording. Working with hundreds of clients, they still devote personal attention to each order. The operation is complete from studio to shipment.

The company is unique in its field in that it has an employee profit-sharing plan. This supplies additional incentive to the employees to see that customers are satisfied and works for the benefit of the client.

The entire operation is geared to precision and speed, and no assignment is too small or too large. As a result, Universal Recorders has become in a comparatively short time one of the recognized leaders in its field.

Another Vinylite pressing of a 16" transcription rolls off the fast-moving production line at Universal Recorders' huge, modern processing plant.

An engineer at Universal Recorders checks the depth of cut, the condition of the stylus and the distance between each groove through a microscope.

For the customer's protection, Universal recommends two original recordings for every important processing job; one to be filed in the library (shown above) which is controlled for proper temperature and humidity.

Something New in Plastic Reels

Audiotape, in 1250 foot sizes, plastic and paper base, is now being supplied on a new, 7-inch, clear plastic reel. The reel has been especially designed for attractive, streamlined appearance and added strength and durability. The side flanges, which have less cut-away area than conventional plastic reels, give more uniform support for the tape and greater resistance to breakage, warping or distortion. What's more, this distinctively Audio design is easier to thread, smoother winding and provides greater protection against damage to the edges of the tape when wound on the reel.

The new plastic reel has been very well received by users in many divergent fields of recording work. And when a busy recordist takes time out to make favorable comments on a new reel design, you can be sure it's really good. It combines the extra strength and rigidity of Audio's all-aluminum reel with the desirable transparency of clear plastic material. You can see right through it. This is particularly helpful on reels containing two or more selections spliced together, as any desired portion can be more quickly spotted by noting the position of the splices on the reel before unwinding. The use of a grease pencil to mark the position of splices directly on the reel flange, also facilitates easy spotting of selections on a machine.

When a reel of plastic-base tape is held up to the light, any splices will show up clearly as white "pips" of light, something like the dots on a radar screen. Incidentally, all plastic base Audiotape, in both 1250 and 2500 ft. sizes, is guaranteed to be *splice-free*. See illustration on back cover.

FICKER RECORDING SERVICE

Ficker Brothers of Old Greenwich, Connecticut, find that there's big business in "small-lot" duplicating of discs and tapes.

Just an hour out of New York City, in Old Greenwich, Conn., is one of the busiest little recording plants we've seen yet. Notice we didn't call it a recording studio — there are no sound-proof rooms, no grand pianos, no fancy trimmings. Yet, out of this little plant go hundreds of acetates each week plus a fair share of pressings. Inside, you'll find a beehive of activity — duplicates being made from tape to disc by means of a Magnecorder and a bank of cutters, stacks of packages containing anywhere from one to fifty records being readied for shipment, sales promotion plans and new ideas being formulated in the front office, newly recorded tape being edited, and last minute packing and checking for a music festival almost anywhere in the East.

Dave Ficker keeps an eagle eye on the bank of four cutters, making acetate duplicates of a tape recording. Magnecord tape recorder is shown on the cover illustration.

This is a first impression of Ficker Recording Service, established in 1947 and fast becoming one of the leading organizations of its kind in the country.

While there are many recording studios and pressing plants thoughout the country, there seems to be a need for someone to specialize in a fast, high quality, acetate duplicating service. Not only is this needed to satisfy the requirements of small quantity purchasers and people who cannot wait the time required for the pressing process, but also because it opens greater channels in the field of on-the-spot recordings of community, school, and industrial events in which the participants have a strong interest and can be sold acetate cuts.

Starting its fifth year as a recording organization, the Ficker service has made a positive move to overcome the confusion, for itself and all other small recordists, of attempting to travel throughout an extended area to tape on-the-spot events and concerts AND THEN being faced with the problem of rushing its limited personnel back to home base to complete the operation by editing and dubbing the order. A separate department assigned exclusively to full time duplicating has been established as the most economical method for themselves as well as for all other recordists wishing to use their facilities.

Through sheer concentration upon, and specialization in, the project of efficient acetate duplication, the Ficker Recording Service has developed a quantity production technique for a process that does not naturally lend itself to mass production methods. Their lathes have, at present, the capacity to turn out large quantities of ten and twelve inch 78's a day and a smaller number of 16 inch discs for its own customers, and the concern contemplates the installation of another bank of cutters as the need arises. In addition, the shop's tape duplication service is assuming larger proportions as magnetic recordings are becoming increasingly popular. Duplicate copies of recorded tapes — in any quantity — can be produced at attractively low prices.

Dave and Thiel Ficker discuss the pros and cons of a new college glee club record album with Miss Joan Peterson.

Audio Devices, Inc. hastens to mention that the entire recording program of this firm is carried on with the use of Audiotape and Audiodiscs, exclusively.

Five years ago the brothers, Nicholas T. and David B. Ficker, not then in the recording business, looked about for a method by which they could earn money in their spare time. Having had a musical background, which they had used to help themselves through college, they naturally explored the field of music merchandising and suddenly hit upon the idea of recording local events and selling acetates to the

Long-playing Vinylite pressing and record jacket of a recent Ficker Recording Service release featuring the Wesleyan University Glee Club.

participants. Starting out with a home tape recorder, no technical knowledge, and considerable nerve, they gradually began to build a recording service that now satisfies the needs of over 300 colleges, high schools, private schools, community musical groups, and state music festivals throughout the East for both acetates and commercial type pressings. Although the quality of their work is considered top grade, they delight in pointing out with a grin that being non-technical, they, as owners, really have not the foggiest concept of the electronic activity that goes on inside of a recording machine. That problem is left up to their chief engineer who is allowed complete freedom, but whose sole responsibility is to give them good musical reproduction.

One important phase of F.R.S. operation is the recording of state and sectional music festivals. These present no problem to the Fickers. Using a well-proven plan of action, they make tests during rehearsals, recordings of the concerts, play back to the participants, and merchandise the sale of records—all without fuss or bother to the director or chairman. Another service that is becoming increasingly popular with their customers is the production of high school and college glee club pressings. Working in conjunction with one of the major record manufacturers, they are putting out some mighty fine standard speed albums and L.P. records.

The Audio Manufacturing Co. has produced a tape developed by Ficker Recording Service for the purpose of vocabularly exereises in language study to be used in conjunction with tape recorders having a switch-over button that automatically throws the machine from playback to record position for as long as the button is depressed. This tape is made with alternating five-second sections of clear and colored tape. It enables the teacher to place a ninety word vocabulary pronunciation exercise at $7\frac{1}{2}$ inch speed, or a ninety sentence exercise at $3\frac{3}{4}$ inch speed on a 600 ft. reel of Audiocator tape using the uncolored segments while any number of students can then use the colored section, erasing each other while the instructor's words are left untouched. This system has been designed to allow out of class study and practice by the student without the presence of the teacher being necessary.

Thirty dollars a week for spare time taping is a modest ,un-exaggerated estimate of what anyone with just a tape recorder can make with a minimum of ease and a maximum of fun in and about his home town. The Fickers have had long experience with just such an operation, and we are sure they would be willing to send specific facts and figures to anyone interested. Such facts as: where to get local recording jobs with a minimum of effort, how many duplicates you probably would sell, suggested prices, profits, copyright clearances, etc. Also, how they could serve you by handling the many details which, for a part time recordist, would make the operation too complicated and time consuming to be worthwhile. This information is available at no cost by writing Ficker Recording Service, Old Greenwich, Conn.

SCHOLASTIC MAGAZINES' RADIO SCRIPT CONTEST FOR 1952 SPONSORED BY AUDIO DEVICES

For the Fifth Consecutive Year, Audio Devices is offering valuable cash prizes for the best entries in Scholastic Magazines' National Script Writing Contest for High School Students

If past performance is any index, the Scholastic Magazines Radio Script Contest for 1952 will be bigger than ever before. For the steady increase in quantity and quality of scripts submitted over the past four years indicates an ever growing interest in radio work among the Nation's high school students.

To students with a flair for writing and an interest in radio and TV work as a possible career, this contest offers a two-fold inducement—in the form of valuable cash awards, plus national recognition for outstanding ability in this very promising field.

This contest is open to any high school student in America. One or more scripts can be entered in any or all of the following three classifications:

1. Original Radio Drama
2. Radio Drama Adaptation
3. General Radio Scripts

A total of 24 cash prizes will be awarded for the best scripts submitted — eight awards for *each* of the above classifications, as follows:

First Prize—$25.00
Second Prize—$15.00
Third Prize—$10.00
Five Fourth Prizes—$5.00 each

In addition, students whose scripts are selected for publication in "Audioscripts 1952" will receive special supplementary awards.

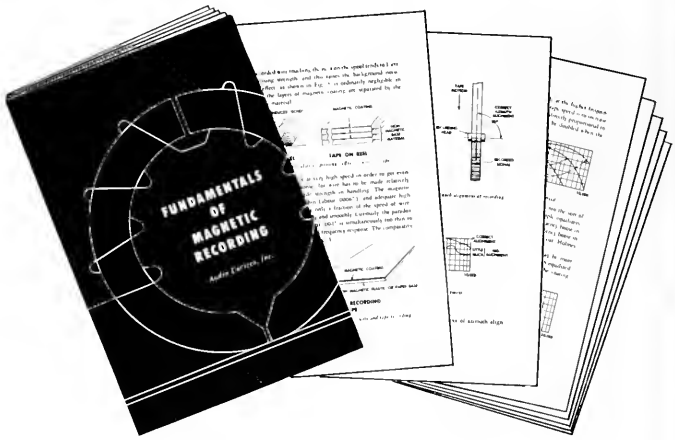
Teachers, too, receive both recognition and reward for their efforts in developing the ability of prize-winning students. The teacher of each student receiving a First Award will receive 25 Audiodiscs, 3 Sapphire Recording Audiopoints and 3 Sapphire Playback Audiopoints—or equivalent value in reels of Audiotape.

If any of our high school readers have not yet received the contest rules and entry blanks, they can be obtained by writing to Mr. William D. Boutwell, Scholastic Magazines, 351 Fourth Ave., New York 10, N. Y.

Students and teachers who are planning to enter the 1952 contest will be particularly interested to know that the prize winning scripts from the 1951 contest are now available in convenient booklet form. "Audioscripts 1951", published by Audio Devices for the benefit of future participants, contains twelve complete student-written scripts selected from prize-winning entries in both the Scholastic Magazines' Contest (for high school students) and the AER Contest (for college students). These scripts, by the way, are all royalty-free, and make excellent material for school dramatization and local radio programs. "Audioscripts 1951" is available at cost—$1.00 net each. Send check or money order to Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

FUNDAMENTALS OF MAGNETIC RECORDING

By C. J. LeBel,
Vice President,
Audio Devices, Inc.



New, 50-page, Technical Handbook Now Available Without Charge to All Tape Recordists

The recording industry has long been faced with the need for a complete, up-to-date and authoritative reference manual on the subject of magnetic recording. This new recording medium has grown so rapidly in recent years that even many professional recordists who use it every day are not thoroughly familiar with all of the basic principles involved — the physical and magnetic characteristics of the tape — and the machine design requirements for optimum performance.

Audio Devices' new manual on "FUNDAMENTALS OF MAGNETIC RECORDING" has been especially prepared to meet this need — to combine, in one convenient, pocket-size volume, all of the basic information which has heretofore been available only from widely separated sources in the technical press. The author, Mr. C. J. LeBel, Vice President of Audio Devices, Inc., is well known to all Audio Record readers through his informative and very readable discussions in our monthly Audio Pointers column. He is one of the country's foremost authorities on the subject of audio engineering and practical acoustics, with an extensive background of experience in every field of sound recording.

The "FUNDAMENTALS OF SOUND RECORDING" is not a highly technical treatise, intelligible only to the relatively small circle of audio engineering specialists. It is an intentionally simplified text which contains all of the important factual information on the subject, presented in such a manner as to be readily understood by anyone familiar with the basic principles of electronics and sound reproduction. It is not recommended, however, for the strictly amateur recordist who doesn't know a decibel from a kilocycle. But anyone who is seriously interested in obtaining a better understanding and practical working knowledge of magnetic recording will find this new handbook extremely helpful. It will answer many of the important questions which are still unresolved in the minds of many recordists and will enable them to use this relatively new recording medium with maximum efficiency.

The following synopsis, by chapter headings, indicates the scope of the information contained in this 50-page, pocket-size booklet.

A Brief History—where and when magnetic recording was first developed and how it was improved upon both here and abroad.

Tape Vs Wire—a comparison of physical characteristics, frequency response, printing effects and timing errors.

Magnetic Recording Method—explanation of transverse and longitudinal magnetization.

Magnetic Relations—B-H curves, hysteresis, remanence and coercive force clearly explained.

Bias—DC and supersonic bias and relative effects on noise level and distortion.

Erasing—DC, AC and modified DC erase, bulk erasure and head demagnetization.

Output — effects of bias current, coating thickness and surface irregularities on output volume and uniformity.

Frequency Response—effects of slit width, azimuth alignment, tape speed, coating thickness and bias current.

Distortion and Noise—relative effects of bias current for different oxides and base materials, bias wave form, harmonic distortion and optimum recording level.

Modulation Noise — causes, effects and measurement.

Tape Construction—base materials, oxides, binders; physical and magnetic properties.

Head and Capstan Cleanliness — suggestions for improving machine performance.

Head Wear — effects on frequency response.

Printing—its cause, effect and cure.

Storage — recommended conditions for maximum shelf life.

Splicing—simple rules for quieter splices.

Selecting a Tape Recorder—dimensions of performance and minimum requirements for various classes of service — radio broadcasting, disc recording studios, educational recording, home recording and office recording.

Machine Features — two vs three heads, bias adjustment, rewind and shuttle speeds, tape speeds vs frequency response ratios.

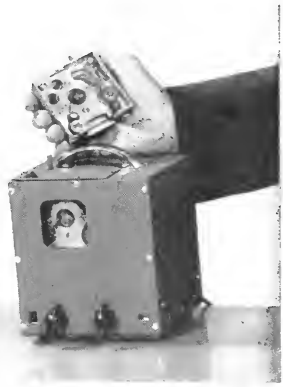
Maintenance — what to check and how often, for best machine performance.

It can be seen from the above that this handbook covers every significant aspect of magnetic recording as simply and concisely as possible. It is 7¾" by 5¼" in size — profusely illustrated with charts, curves and diagrams.

To obtain your free copy, simply send a request on your company letterhead, to Audio Devices, Inc., Dept. R3, 444 Madison Ave., New York 22, N. Y.

NEW MIDGET TAPE RECORDER

Repeats Messages Endlessly for Sales and Safety



Now in production by the Mohawk Business Machines Corporation, 47 West Street, New York City, this midget-size automatic tape recording and playback unit weighs only 6 pounds, and measures only 6" square. It is intended primarily as a selling tool—for the continuous or intermittent repetition of a sales or advertising message. It also has a wide field of application as a safety or warning device, as well as for repetitive announcements of the type required at transportation terminals.

Despite its small size, the equipment is completely self-contained, including a 5" Alnico V speaker, 3-tube amplifier with 1½ watts output, driving mechanism for 3¾" tape speed, and a unique, automatic loading tape cartridge. This removable plastic cartridge, containing the endless reel of magnetic tape (2 minutes playing time) is not much larger than a package of cigarettes. To load, the cartridge is simply slipped into a slot in the top of the case. This automatically brings the tape in proper contact with the magnetic heads and engages the drive mechanism. For easy removal, the cartridge pops up when a release button is pressed. Tape can be erased and recorded on the spot, obviating the need for sending cartridges back to the factory for recording.

A full two minute tape will repeat its message continually, or the message can be divided into as many intervals as required—the tape mechanism stopping, if desired, after each interval. The device can be actuated by its self-contained stop-start switch, or by any external control device, such as a photo electric cell, treadle switch, or micro switch. Jacks are provided for external speaker, booster amplifier and microphone. The Message Repeater has a frequency response of 120-6000 cycles per second. It retails for $159.50.

The manufacturer also expects to produce cartridges, at some later date, containing up to 30 minutes of recording time, which will not only extend commercial usage, but will offer interesting possibilities in the field of recorded music for home use.

Suggested applications for the Message Repeater include the following: At super markets—to call attention to special sale items or displays. In industrial plants—to repeat safety warnings. At bus, airline and railroad terminals to repeat announcements of arrivals and departures. In department stores—for talking counter displays. In auto show rooms—to give sales talks automatically when car door is opened. In hotels—to repeat special announcements. In hospitals—to page doctors. For civil defense—to repeat air raid instructions.

Complete information on the new, midget-size Message Repeater can be obtained by writing to the Manufacturer.

EDUCATIONAL RECORDING CONTEST UNDER WAY

$ $ $

Although Audio Devices' offer of cash prizes for the ten best articles on educational recording was only announced in the last issue of Audio Record, many entries have already been received.

If you are engaged in any phase of educational recording work don't overlook this opportunity to cash in on your experience. For *each* of the *ten best* articles submitted, Audio will pay $25 cash, plus *ten* 1250-ft. reels of plastic-base Audiotape. In addition, ten reels of Audiotape will be given for every *other* contest entry which is used for publication in Audio Record or any other literature prepared by Audio Devices.

Please make your stories as *specific* as possible—telling exactly *how* you use tape or disc recordings in your work. Cover as many applications as you wish. Length is no object. And don't forget to include photographs if they are available.

Entries must be post marked not later than Dec. 15, 1951—addressed to Contest Editor, Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

TURN YOUR OLD DISCS INTO DOLLARS

—and help insure your supply of new aluminum-base discs, too!

Your old used aluminum base discs may be worth more than you think. For, despite today's restrictions on the purchase and use of scrap aluminum, Audio Devices can still pay you top cash prices for your used discs.

By taking advantage of this long-standing offer, you benefit two ways—in direct cash payments that can mount up to a really substantial sum, and in contributing to the supply of aluminum available for disc production. This means more new discs for *you* when you want them.

Audio Devices will purchase any make of aluminum base disc—of any size—and in any quantity—at the following rates:

10" — 4 cents each
12" — 8 cents each
13¼" — 10 cents each
16" — 15 cents each
17¼" — 15 cents each

You don't have to pay the shipping charges, either. Audio Devices will pay cheapest way freight on all shipments of 100 pounds or more. All used discs should be returned to:

The Audio Manufacturing Corporation
25 Palmer Avenue,
Glenbrook, Connecticut

Every year, recordists receive checks amounting to many thousands of dollars from Audio Devices for the return of their old discs—dollars that mean lower over all recording costs.

If you have a supply of used aluminum-base discs on hand—discs that are just collecting dust, why not let them collect *cash* for you instead. You'll be surprised how much it can add up to.

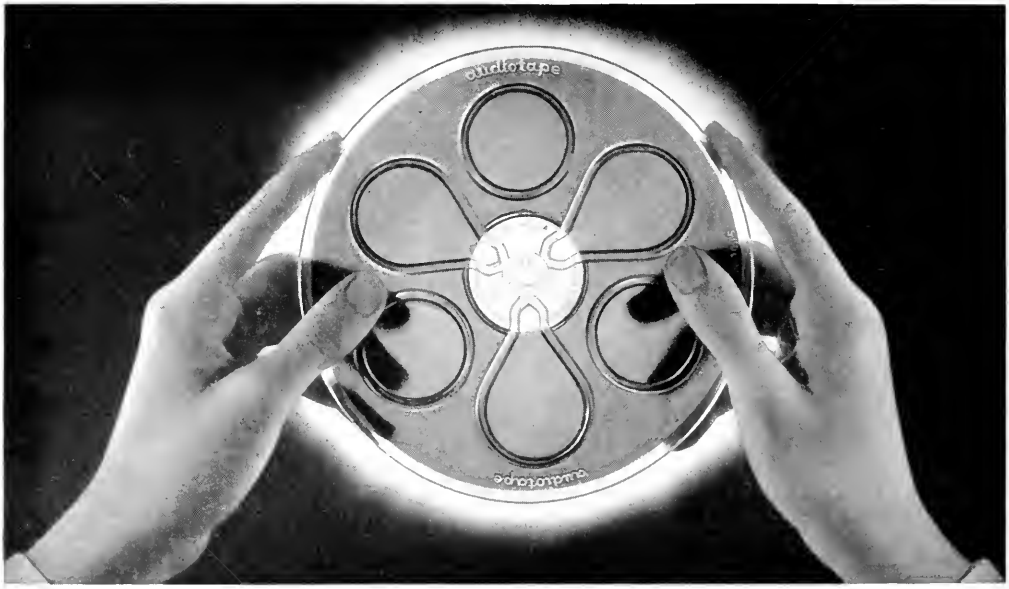
HOW DO YOU LIKE OUR NEW FORMAT?

As you've probably noticed by now, Audio Record has had its face lifted. We hope you like it—and would appreciate your frank comments on the subject.

If you have any suggestions for improvement of the subject matter or style, please send them in. Audio Record is *your* publication, and we want to make it as interesting and helpful to you as possible.

You don't have to look, because

in



. . . but this "transparency test" shows some other important things about Audiotape quality

When you hold a reel of plastic base Audiotape up to the light, notice its extremely uniform translucency—free from dark rings or fuzzy areas. You can see your fingers right through it, sharply outlined against the light. This is proof of the clean, straight line slitting that makes Audiotape track and wind absolutely flat. There are no rough or turned-over edges which would lift the tape away from the heads, causing loss of high-frequency response. Of course this test also proves that the tape is entirely free from splices. But with Audiotape you can be sure of that without looking. For all 1250 foot and 2500 foot reels of plastic base Audiotape are *guaranteed splice-free!*

You can *see* the output uniformity of Audiotape, too. For every 5-reel package includes an Esterline-Angus output chart, showing the measured output of the entire length of one of the reels in the package. And since all 5 reels are slit from the same roll after coating, the chart actually measures the uniformity of all the tape in the package. This gives positive visual proof of Audiotape's unequalled output uniformity.

NO OTHER TAPE OFFERS YOU ALL OF THESE EXTRA-VALUE FEATURES:

Splice-Free Reels. All 1250 and 2500 foot reels of plastic base Audiotape are *guaranteed* to be free from splices.

Unequalled Uniformity. Plastic base Audiotape is guaranteed not to exceed ±¼db within the reel and ±½db from reel to reel.

Output Curves in every 5-reel package of plastic base Audiotape show actual measured output of the tape contained in the package.

Maximum Output with Minimum Distortion. Oxide formulated to give high output at bias which results in low harmonic distortion.

Safe-Handling Package for 2500 and 5000 foot reels permits loading onto turntable without danger of spilling tape from hub, simplifies attachment of reel flanges, and provides safe storage without flattening bottom of roll.

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DECEMBER 1, 1947 • VOL. 1, NO. 9

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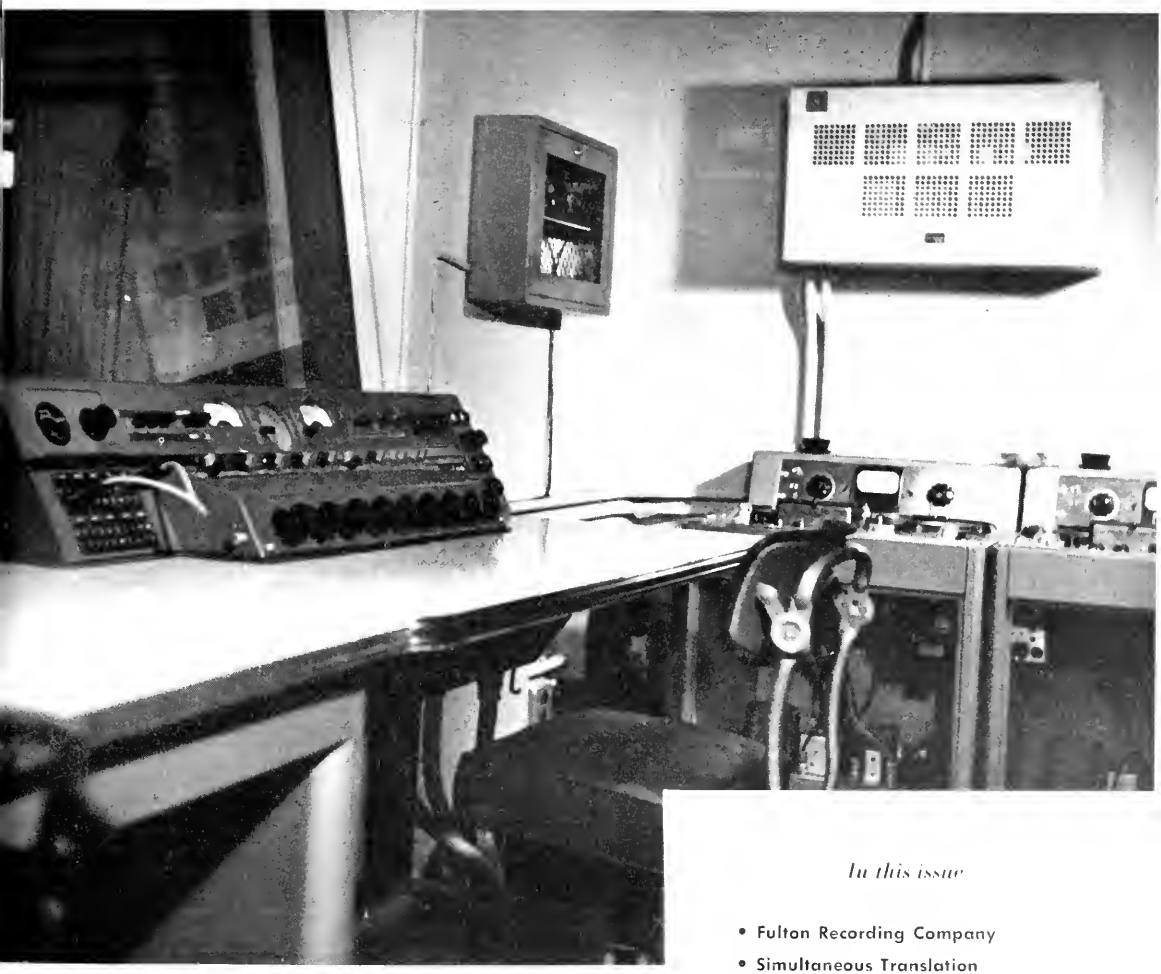


Control room for main sound studio at the new Fulton Recording Company, 80 West 40th Street, New York, N. Y., showing Western Electric, six-mike mixing console and two of the seven Ampex console-type magnetic tape recorders. Story on pages 2 and 3.

In this issue

"CLEAN SOUND" KEYNOTES NEW YORK'S NEWEST RECORDING STUDIOS

Fulton Recording Company Opens Ultra-Modern Sound Studios In Mid-Manhattan

Unlike many present-day recording studios, which started from small beginnings and "just grew" like Topsy, the Fulton Recording Company started life as an already full grown organization, with completely modern facilities and equipment conceived and engineered as a unit, to provide the finest in sound recording service. Occupying the third and tenth floors at 80 West 40th Street, New York City, this new organization offers an interesting example of carefully planned studio layout, modern acoustical treatment, and the last word in precision sound recording methods and equipment.

The Fulton Recording Company is completely equipped for disc, tape and film recording — with two separate recording studios and control rooms, instantaneous and master disc cutting rooms, large tape and disc storage facilities, and private tape editing rooms on a separate floor.

The entire suite of offices, studios, control rooms and work rooms is air conditioned to precise specifications of temperature, humidity, and freedom from airborne dust particles. The constant temperature and humidity keep all studio musical instruments in perfect tune regardless of ambient temperature changes and assure exact duplication of acoustical effects for a given recording setup, regardless of the time interval between recording sessions. Freedom from dust particles is, of course, a tremendous asset in cutting microgroove discs and preparing masters for processing.

The main recording studio is of particular interest, as its unusually great height permits a very large floor area yet maintains an overall length-width-height ratio which is remarkably close to the theoretically ideal acoustical proportions of 5 3 2. This studio is 50 feet long, 35 feet wide and 24 feet high — enclosed on all sides by double walls with air space between. In acoustical treatment, this large studio has been designed to offer a practically limitless combination of sound reflection and absorption effects. The walls themselves are absolutely plain, with no fixed acoustical panelling. And both walls and ceiling are so constructed that the studio is completely free from parallel surfaces. A series of full length curtains 24 feet high are suspended from ceiling tracks all around the room, in such a manner that any or all portions of the wall area can be covered or uncovered as desired simply by opening or closing the proper curtains. In addition, the studio is provided with a number of movable acoustical panels, one side designed for reflection and the other for absorption of sound. This gives still further flexibility in obtaining special acoustical effects for small orchestral groups and solo numbers.

A portion of the main sound studio at Fulton Recording Company, showing the 24-foot high curtains on ceiling tracks which permit variation of acoustical treatment. Studio measures 50 by 35 by 24 feet, closely approaching the theoretically ideal acoustical proportions of 5—3—2.

The main studio's musical equipment includes a Steinway grand piano, Hammond organ, Celeste, Vibraphone, Chimes—plus an extensive collection of live sound effect gadgets. The latter, of course, are supplemented by a sound effects library of several hundred discs, covering just about every

audio record
VOL. 7, NO 9 DECEMBER, 1951

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Western Electric, 6-mike mixing console in control room for main sound studio at Fulton Recording Company. Auxiliary panel at right-hand end of console contains special push-button controls for operation of the Ampex tape recorders.

conceivable natural and man-made sound —from the chirping of a cricket to the roar of a bomber in flight. In order to take full advantage of the perfect sound control which this studio provides, only the finest and most costly microphone equipment is used, including the recently developed Telefunken condenser microphone. (This device is described in the October 1951 issue of Audio Engineering.)

The control room for this studio is located high in the east wall, with a large inclined glass window giving an unobstructed view of the entire studio floor. It contains a Western Electric six-microphone input mixing console, three Ampex console-type magnetic tape recorders (there are a total of *seven* of these machines throughout the various recording rooms), a large RCA monitor speaker and complete timing and intercommunication facilities. The operation of the tape recorders is completely controlled by push buttons located at the right side of the control console. The engineer in charge therefore has the entire recording operation right at his own fingertips, without the need for flashing a signal to another operator handling the tape machines.

The second recording studio is smaller in size, designed primarily for voice recording of small groups. Here, too, a wide variety of acoustical treatment is permitted by the use of plain walls and movable acoustical panels of the type previously described for the large studio. This small studio has its own separate control room, equipped with a four-microphone RCA mixing console and Ampex tape recorders push-button controlled from the console. For outside tape recording work, portable Magnecord machines are used.

Equipment for the cutting of instantaneous and master discs includes two Fairchild variable-pitch, hot-stylus disc recorders and three Presto machines. Master discs are cut in a separate room, provided with independent amplifiers and equalizers. Engineers familiar with the intricacies and precision requirements of cutting microgroove discs will appreciate the importance of being able to do this exacting work in private and without interruption or distraction.

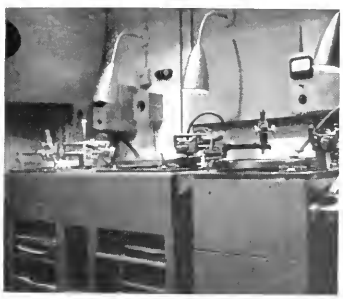
The provision of separate tape editing rooms is another feature planned for the convenience of Fulton clients. For example, after making a dozen or so "takes," the client and an engineer can immediately retire to one of the editing rooms and play back all of the recordings in undisturbed privacy—giving their undivided attention to the job at hand.

Sound recording for motion picture and TV films is done on standard 1/4-inch magnetic tape, with a separate synchronizing signal added directly on the tape while recording. This is accomplished by means of a Rangertone synchronous signal machine which forms a part of the specially designed film recording equipment. Here's how this system works. Assume, for example, that a client comes in with a 16mm print of a film to which he wishes to add a sound track. While the film is being projected, the sound is simultaneously recorded on 1/4-inch tape together with the synchronizing signal. After recording, film and sound can be played back immediately—the synchronizing signal keeping the picture and sound in exactly the same relationship to each other as during the recording. This playback gives a fool-proof check on the correctness of both the sound and the synchronization, after which the film and reel of tape are sent to the photographic processing plant where the sound is transferred to the film track.

Mr. R. J. Oulmann, General Manager of the Fulton Recording Company, states that although this new organization is geared to do large volume recording work, the major emphasis is on quality rather than quantity. With this objective in mind, all recording equipment is completely checked *every day* . . . to make sure that there is not the slightest deviation in recording characteristics and fidelity of sound reproduction. Every tape and every disc produced is checked from beginning to end, and must measure up to quality standards even higher than those actually required by Fulton clients. Hence the slogan "Clean Sound" which is used in this Company's promotion to characterize the quality of their service.

One particularly exacting assignment which is currently in production for the Haydn Society is the recording of 81 sides of an 83 side collection of the complete quartets of Haydn performed by the Alexander Schneider String Quartet. The other two sides were recorded in Europe. This is typical of the character of work which the Company is equipped to handle.

Mr. Oulmann brings to the Fulton Recording Company an extensive background of experience in the sound recording and motion picture field both here and abroad. He was director of motion picture production at MGM International and has been in the recording end of this business for the past 24 years. Mr. Newton Avrutis, Supervising Engineer, was formerly with MGM International in charge of recording foreign sound tracks on feature films and shorts. Mr. Richard E. Mack, Chief Sound Engineer, was previously with Audio and Video Recording Corporation and the Carnegie Hall Recording Company.



Three of the five disc lathes in Fulton Recording Company's disc recording room. Equipment includes two Fairchild variable-pitch recorders with hot-stylus cutting heads.

LANGUAGE BARRIERS BROKEN

by IBM Simultaneous Interpretation System

EDITOR'S NOTE: The new United Nations Building in New York is probably as close to being a modern "Tower of Babel" as it is possible to get. For here delegates from all over the world speak freely—each in his native tongue. Yet each can be heard—and *understood*—by all others present. Because of the importance and technical ingenuity of the multi-lingual communication equipment used here and at other international gatherings, we are sure that the following description will be of timely interest to our readers. This same IBM system is also used in the teaching of foreign languages and other applications involving the simultaneous transmission of recorded material to a diversified audience on a selective basis.

With the advent of large international meetings in connection with world trade and international commerce following the first World War, the frustration of the language barrier brought into being the use of simultaneous interpretation.

About 20 years ago, Mr. E. A. Filene conceived the idea of expanding the whispering interpreter technique, then being used by some delegations, to a system whereby a complete service could be rendered to the conference as a whole. In the whispering technique a delegate who does not understand the language being spoken could have an interpreter sitting at his elbow give him a running whispered translation of the proceedings. While this was an improvement over the consecutive interpretation system whereby each speech was repeated into each of the different languages causing much delay and confusion in the meetings, it was still rather crude and annoying to the surrounding delegates.

The basic idea of the simultaneous interpretation was to provide booths semi-soundproofed from the main convention hall in which interpreters could listen to the speaker's words conveyed to them from the speaker's microphone through a wired system to sets of headphones. While listening to the speaker's words on the headphones, they would give a simultaneous running translation into their own microphones. The microphone of each different language interpreter would have its associated amplifiers and wired distribution cables to every seat in the room. Each seat would be equipped with a pair of headphones and a selector switch allowing every delegate to listen to the language of his choice.

From the crude beginning of this telephone type of system, another international figure, Mr. Thomas J. Watson of the International Business Machines Corporation and associated with Mr. Filene in the International Chamber of Commerce, picked up the idea and with the facilities of the international organization of the IBM, proceeded to improve the system and build a workable set of equipment which could be used at the meetings of the International Chamber of Commerce, the International Labor Organization, Rotary International, and the League of Nations.

Simultaneous interpretation equipment has been used for the last 20 years at these large international meetings and finally came into its own with the needs brought up at the War Crimes Trials at Nuernberg. Here a vital need for continuous and immediate understanding of everything going on at the trials caused the United States Government to promote the idea of installation of the IBM equipment in all of the court rooms at Nuernberg and likewise at Tokyo. IBM agreed to lend the necessary equipment to the Allied High Command and proceeded to overcome the difficulties of procurement in order to build the additional equipment required and to bring in all existing equipment for use in Germany.

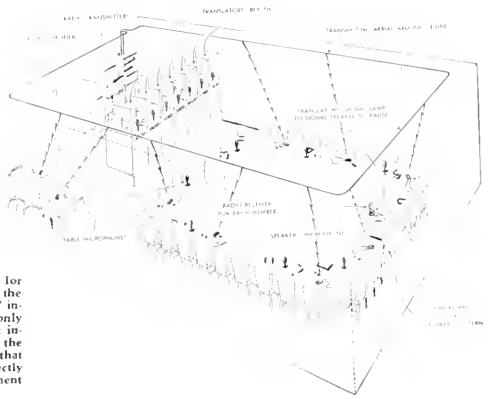
Headset and miniature radio receiver for the IBM Wireless Translating System embodying Filene Finlay Patents. The shoulder strap contains an embedded antenna and the receiver is battery operated, permitting the listener to move about freely without any fixed connection to power or other outlets.

The success of this system at Nuernberg, which was capably organized and operated under the direction of Col. L. E. Dostert, made the use of simultaneous interpretation a "must" at the United Nations. At the conclusion of the trials in Nuernberg, Col. Dostert became associated with the UN at Lake Success and again became the guiding hand in the formative days directing the work connected with the installation of IBM Simultaneous Interpretation Equipment in the conference rooms and council halls.

One of the most difficult tasks in connection with the use of simultaneous interpretation such as that experienced by the UN, was the building up of a corps of interpreters capable of simultaneous interpretation and of top caliber necessary for the deliberations of the world's top tribunal.

A serious drawback to the use of the simultaneous interpretation up until this time was the time and labor involved in wiring the language channels to each seat. This not only required many hours of labor and a rather high expense in the installation, but it definitely "fixed" the seating arrangement of the room because of the attachment of the cables to the chairs.

Mr. Watson had, for a long time, proposed the building of a complete wireless system but due to restrictions caused by the war and the press of other more im-



Schematic diagram of typical setup for IBM wireless translating system, of the type used for so-called "temporary" installations which are to be used for only a few weeks or months. Permanent installations such as that used at the United Nations are similar except that the listeners headsets are wired directly to the speech amplifier equipment without the radio link.

portant development projects the wireless system had not been completed at the time of the Nuernberg trials. The development project was given top priority in 1946 and the system completed for the first use on a large scale at the International Radio Conference in Atlantic City in 1947.

The IBM Wireless Translating System consists of miniature battery-operated receivers for each delegate. This receiver has a neck strap for support which also acts as an antenna. The three small hearing-aid type of tubes furnish the necessary pick up and amplification to operate a pair of headphones attached to the receiver. Each receiver is provided with seven separate channels which can be selected by the delegate simply by turning a selector dial on the top of the receiver. The simultaneous interpretations are "broadcast" to the conference area by small radio transmitters connected to the interpreters' microphones. Each interpreter's booth or language has its own broadcast frequency.

In a conference where several delegations are meeting in a round table discussion, microphones are provided for each delegation and are controlled from a central point by the control operator handling the equipment for the entire conference room.

With the availability of the IBM Wireless Translating System at moderate cost to international conventions, the use has increased tremendously in the last two or three years. International conferences both large and small can now reap the benefits of universal understanding and break down the language barrier which has existed in the past by the use of this system. Equipment can be installed at a conference site in a very short time because there is no longer the requirement of cabling or wiring all of the seats.

IBM built 5000 of these miniature wireless receivers and keeps the supply about evenly distributed between Europe and the United States. Complete equipment is available for 16 international conferences running simultaneously in various parts of the world. Conferences in Europe and the Near East are serviced with equipment from the IBM organization in Zurich, Switzerland, while conferences in North and South America are serviced from the IBM main factory at Endicott, New York.

In order that the record may be straight and the necessary documents available at international meetings, the practice of recording the proceedings is becoming more and more prevalent. The entire conference proceedings from the speakers or floor microphone are normally recorded on tape or on discs. In many cases recorders are also connected to the individual channels of the simultaneous interpretation system in order to afford verbatim reports of the actual proceedings as translated and as heard by the delegates. This system of recording the translated channels provides a quick check if a question is raised as to the accuracy of any particular simultaneous interpretation of a knotty question. Recording of the various language channels provides a means of producing the necessary conference documents immediately so that mimeographed resumes of the proceedings into working languages may be furnished to the delegates at once.

The United Nations General Assembly in session at Lake Success, New York, showing the IBM simultaneous interpretation system in use. This same permanently wired system is in use in the new U.N. building in Manhattan, permitting each delegate to listen to a running interpretation of every speech while it is being given.

Patent Awarded for "Safe-Handling" Audiotape Package

This Audiotape package is now covered by U. S. Patent No. 2571133.

With the many thousands of different package designs in use today, you've got to have something that's really *original* and *distinctive* in order to obtain a clear patent on it. That's why it was very gratifying to receive word that the "Safe-Handling" Audiotape package had been found patentable and is now fully protected by U. S. Patent No. 2571133.

For the past year, this distinctive package has been used for all 2500 foot and 5000 foot reels of Audiotape, on Standard N.A.B. hub or complete aluminum reel.

The separate folding inner container, with wooden hub core and turntable loading slot, offers three important advantages:

1. It permits tape on hub to be transferred from package to turntable without danger of becoming unwound or slipping from the hub. The inner container, held as in insert above, is placed on the turntable so that the tape hub engages the hub core of the machine. The container is then simply pulled out from under the tape. In returning tape to container, this operation is just reversed.

2. It simplifies the attachment of reel flanges to the standard N.A.B. hub. After one flange has been set in place and the half-screws dropped into the holes, the inner container is folded down onto the reel, permitting it to be turned over without dropping the screws.

3. It protects tape in storage and prevents flattening of the bottom of the roll. That's because the tape is suspended from the wooden hub core fixed to the inner container and does not rest on the outside edge of the roll.

audio pointers for the Recordist

by C. J. LeBel, Vice President
Audio Devices, Inc.

HINTS ON SELECTING A TAPE RECORDER

C. J. LeBel

The past several years have seen many new tape recorders offered to broadcaster, studio, school, and home. Prices vary from under a hundred to over four thousand dollars and it is only natural for the purchaser to want to pay as little as possible. If he is wise, he will also wish to spend enough to secure the facilities and results he needs for his work. A full discussion of machine design would take a book in itself, so that we will have to content ourselves, in this section, by pointing out the factors to be considered, and by touching lightly on certain necessary characteristics.

Dimensions of Performance

In any application the recording performance is the first thing to be considered, the most important point being, the frequency range. If this is too small for your work, there will be complaints of poor intelligibility or of lack of naturalness, or refusal to broadcast your tapes. If the range is too great, you have paid too much for your equipment. The next factor is that of signal to noise ratio, for if this is too small background noise will be offensively loud, and the adjustment of recording level will be too critical. Again, if the ratio is *much* greater than necessary then the equipment cost has been higher than it might be. Finally, the distortion should be low, since high distortion leads to a loss of clarity and naturalness, and listener fatigue is rapid.

Next we must consider economy of tape use. Low tape speed means that we need less tape for a given program, but it also means either reduced frequency range or increased noise level, for a given perfection of design. We can cut our tape requirements in half, theoretically, by using dual track recording. Practically, this is often undesirable, for it makes editing impossible, and introduces slightly higher noise level.

Convenience of operation is particularly important to the non-professional, as are size and weight. No amateur wishes to carry his machine around on a hand truck. Many semi-professionals overvalue the extreme in portability, and so sacrifice some of the quality of performance that they need. In many cases a heavy machine can be rolled around on a tea cart.

Finally, we must not overlook stability of characteristics, and durability. The broadcaster and the studio must have it, the school needs it, and the home user is irked by the lack. Some machines have been made with every component driven too hard, suitable for operation over only a short period of time, while others have been built to stand up when used sixteen hours a day.

In each field of application a different set of requirements predominates, for what is best for one is not necessarily best for the other. So each application must be studied separately.

Radio Broadcasting

The National Association of Radio and Television Broadcasters has adopted standards for frequency response, shown below. Studio recorders should conform to the primary standard curve, but portable machines used for field interviews — speech only — will find the secondary standard satisfactory.

The signal to noise ratio should be at least 50 db, using a reference point of 2% harmonic distortion. Since this reference is a peak level, distortion should be less than 1%, harmonic, at 10 db or more below the reference level. The volume indicator setting, that is, the nominal recording level, should be at least 6 and preferably 10 db below the 2% reference point, to allow for the fact that the peak level is about 10 db above the meter-indicated level.

Remembering that a station must often run many hours a day with no time out for equipment maintenance, the recorder should be able to run for at least 16 hours continuously without significant change in gain or distortion.

The average studio recorder is too heavy to be portable, but there are several makes of semi-portable design, using two 35 to 45 pound units. These offer nearly full studio quality, and many stations use them interchangeably in studio and field.

Disc Recording Studios

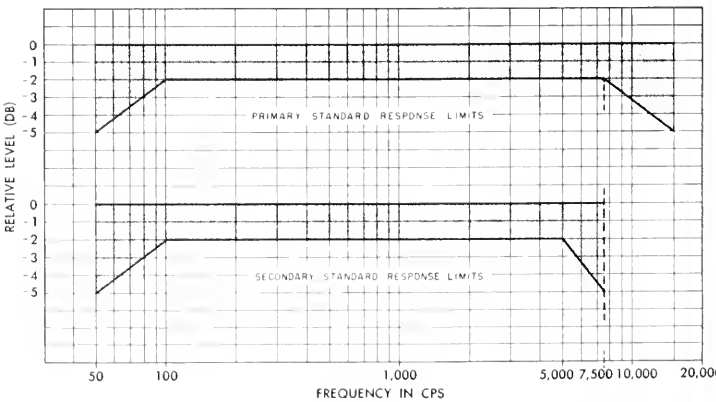
While these remarks are directed mainly to the phonograph record and transcription studio using tape for original recordings, they also are significant to the radio station which produces commercial records. The main objective is to make sure that the tape will produce minimum impairment of the quality of the disc recorded from it.

The frequency range should be at least as good as the NARTB primary standard (see chart), and might well be somewhat better — say not over 2 db change in response up to 15 kc. The signal to noise ratio must be at least 60 db to match a modern vinyl pressing, and preferably 62 or 63 db. The distortion should be as low as possible in the normal range of recording levels. Stability should certainly be adequate for 16 continuous hours of operation without significant change of gain or distortion.

There are no portable machines conforming to this specification; there are a few transportable models consisting of two sections of about 75 pounds each. For the lower grades of work a broadcast portable machine may be used, but there is a significant sacrifice in performance.

Educational Recording

There is no single educational applica-



NARTB Recording and Reproducing Standard, showing frequency response limits for magnetic tape systems.

tion—instead there are at least three, each with its own special aspects.*

First comes material which is to be broadcast; this should certainly be prepared on equipment at least equal to broadcast standard. See the broadcast section. Next comes material where *accuracy* of reproduction is essential. In order of decreasing need for wide frequency range we have experimental phonetics, and speech correction. For the former a full 15 kc range is essential, while for the latter 7.5 to 10 kc may be satisfactory. The frequency range needed to clearly show a student a speech fault is surprisingly great.

Finally we have applications where reproduction must be pleasing and intelligible, but need not be particularly accurate. Here 6 kc is quite adequate. It should be pointed out that the school with only 6 kc equipment will be unable to do a workmanlike job of speech correction, whereas a wider range machine can be used for less stringent projects when the full range is not essential. Therefore, any school should have at least one wide range machine, even if the full range is only needed part of the time.

Listener fatigue is particularly to be avoided in educational applications, and we believe that a signal to noise ratio of at least 50 db is essential for material which is to be listened to with attention for more than five minutes at a time; for other cases 45 db may well suffice. For minimum fatigue the distortion should be under 1% in the normal level range, though it may rise to 2% on peaks.

The school has rather special stability requirements, for a machine should operate for five months (one term) a few hours a day, without need for maintenance, and major maintenance should be required no more often than once a year.

A school machine must have fast forward and fast rewind (at least 5 and preferably 10 times normal speed) so that a given section of tape may easily be picked out for use.

One educational group has voted to standardize on single track equipment to make editing possible, but this is not yet exclusive practice throughout the country.

The need for portability in educational equipment is badly overestimated. If the individual sections are not over 35 to 40 pounds in weight, the heavy combination can well be carried about on a tea cart or cafeteria cart.

Two input circuits are virtually essential, a radio tuner or line, and one (or more) microphones. As to the output, it should be possible to use a high quality external loudspeaker instead of the wretched unit so often built in. It should also be possible to feed a line usually the school public address system.

Machines which live up to all these specifications may cost three to four times as much as the lowest cost equipment.

Home Recording

Home use takes either of two forms: speech or music. In the former case, 6 kc frequency range is likely to be adequate; in the latter, at least 9 kc and preferably 15 kc should be available. Modern home phonograph records have good response up to at least 12 kc, and 15 kc in some cases, so that comparable response should be available.

For short time listening a signal to noise ratio of 40 db may be adequate, but for extensive use at least 50 db should be available. Remember that a modern vinyl phonograph record has at least 60 db when measured by the same method as a magnetic recorder.

The same dual standard applies to distortion. For a few minutes a sustained 5% is bearable, but for long continued listening with close attention, minimizing listener fatigue demands an upper harmonic limit of 1 or 2%.

The choice between single and dual track recording is again a question of editing versus economy.

Portability demands a weight of not over 30 to 35 pounds, though some enthusiasts have managed to handle a 65 pound professional machine. If left in a single place, weight is certainly not a serious matter. Home machines generally have all the input and output circuits required.

Office Recording

If we are to judge by European example, the office dictation field will be a very successful application for magnetic recording, and indeed several manufacturers are already in the field. Economy possibilities are very attractive.

For clear reproduction of the sibilants and fricatives of speech, at least 4 to 5 kc range is necessary, and 6 kc may be desirable. For minimizing listener fatigue the signal to noise ratio should be at least 35 and preferably 40 db. The distortion should also be low, not over 2% during normal operation, and not over 5% on peaks.

Portability is not essential, but minimum use of desk and floor space is quite necessary.

Machine Features

A number of features are available in the better grade of machine, and the purchaser should decide in advance which are necessary for his particular application.

First we have the question of two head versus three head machines. All machines have an erase head; a two head machine uses the second head alternately for recording and reproducing, whereas a three head design has separate record and reproduce heads. Since the requirements for optimum performance in recording and reproducing are not alike, a double duty head is at best a compromise, and slightly better performance can be achieved with separate heads. They also permit monitoring off the tape during recording a wise safety precaution during important jobs.

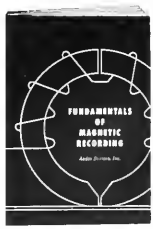
Adjustable bias is desirable if the absolute utmost in quality is to be obtained. Lower cost machines have a fixed value of bias, which is somewhat non-uniform from one machine to the next off the production line. Fortunately, Audiotape has considerable bias latitude, and so long as the bias is more than a minimum safe value, good results will be obtained.

In professional machines recording at 15 inches per second, excessively fast rewind and forward shuttle speeds should be avoided. At very high speed momentary heavy stresses are induced in the tape, deforming it and leading to trouble during subsequent handling.

To minimize head wear it is desirable to have means for lifting the tape off the heads during rewind and fast forward operation.

Since demagnetizing the recording head is a regular operation, convenient provision for it should be made.

A year or two ago, the relation between frequency range and tape speed seemed to be one kc range per inch per second speed. Today, professional machines may offer 1.4 kc per inch per second, and some home machines (where signal to noise ratio is not so much of a problem) offer 2 kc per inch per second.



The foregoing is an excerpt from one of the chapters in Mr. Le Bel's new handbook on the Fundamentals of Magnetic Recording.

This 50-page pocket-size volume includes a wealth of valuable information on all phases of magnetic recording including background, recording methods, magnetic relationships, tape characteristics, AC and DC bias, erasure, frequency response, noise level, distortion, machine features and helpful hints on operation and maintenance.

Copies may be obtained by writing to Audio Devices, Inc., Dept. R3, 444 Madison Avenue, New York 22, N. Y.

*See Standards for Educational Recording Machines, by C. J. LeBel, Quarterly Journal of Speech, Vol. 36, No. 4, pp. 520-523, Dec. 1950. Reprints available from Audio Devices, Inc.

For more than 12 years, Audiodiscs have consistently set the standards for the finest professional performance in instantaneous and master disc recording. Their flawless perfection, wide-range frequency response, extremely low surface noise at all diameters and complete freedom from humidity effects are just a few of the reasons why Audiodiscs are first choice with professional recordists from coast to coast. They know from long experience that they can depend on Audio for the *consistent, uniform quality* that is so essential in modern sound recording work.

Wherever professional-quality magnetic recordings are made, the trend is to Audiotape. That's because Audiotape is made *by* audio engineers *for* audio engineers — with the right combination of properties for finest performance in any tape recorder. Produced on Audio's highly specialized precision coating machines, Audiotape has achieved unequalled *uniformity* of output — plus maximum output with minimum distortion at practical bias range. What's more, it's less sensitive to bias changes, has no audible low-frequency modulation noise, and is guaranteed *splice-free* in both 1250 and 2500 ft. sizes, plastic base. In every respect, Audiotape meets the exacting standards of quality and performance which have characterized Audiodiscs for more than a decade.

extends the advantages of finest quality magnetic recording to motion picture and TV applications. Available in 16mm, 17½mm and 35mm sizes.

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Handbook on
The Fundamentals
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This completely new and up-to-the-minute technical manual contains 50 pages of valuable information on basic magnetic principles and tape performance. Professional recordists will find it extremely interesting and helpful — an important addition to their reference files. A request on your business letterhead will bring you a free copy by return mail.

Write to Audio Devices, Dept. R3.

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January 1952, Vol. 8, No. 1

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The new "Multitape" magnetic tape duplicating machine in process of loading by Dr. F. Rawdon Smith, president of Rawdon Smith Associates, Inc. Story on page 2.

In this issue

"Multitape" System for Tape Copying Announced by Rawdon Smith Associates, Inc.

New Tape Duplicating System Permits Quantity Reproduction of Recorded Tapes at Low Cost and Without Loss of Quality

Most tape users who have had access to two tape recording mechanisms simultaneously have tried the experiment of recording a tape on one from a "master" played back on the other. Oftentimes, the results of such an experiment are remarkably satisfying and, particularly where equipment of limited frequency response is used for the final listening, it may even be difficult to tell the copy from the original tape.

Where home recorders are used, such satisfactory results are most often obtained where both sets of equipment are in good condition and where the recorded material is such as to be relatively undisturbed by small transient changes in pitch, i.e., wow and flutter. Where a piano or organ recording is involved, however, the results are usually less satisfactory, since both these instruments are capable of giving out sustained notes of remarkably constant pitch and will hence sound unnatural where a pitch variation is introduced in the process of reproduction.

Magnetic tape, however, is used for the original recording for virtually all present day commercial discs—which are produced by re-recording from the master tape—so there would seem no impossibility in producing tape copies by the use of a similar re recording process, provided both the play back and the re-record tape mechanism are in proper adjustment. The cost of producing copies in this fashion, however, is high and when an attempt is made to lower this by the simultaneous use of several recorders coupled to one play back mechanism, a number of difficulties become apparent.

In the first place, it is difficult and expensive to maintain many recorders in first-rate order. Secondly, even when recorders of identical manufacture are used, the bias frequencies will vary by an amount which is often sufficient to cause "birdies" in the final tapes. If this is overcome, either by the use of a common bias oscillator or by synchronizing several oscillators, there remain such problems as increased wow from master to copy and—particularly important for broadcast use—slight differences in timing between the master and copy and between one copy and another, as a result of very slightly differing tape velocities on different machines.

All the foregoing difficulties, and others with which those who have tried "multiple dubbing" are well familiar, were in the minds of the co-developers of the Multitape machine pictured above. The mechanical arrangements of this machine are the brainchild of L. S. Toogood of the Toogood Recording Company, 221 North La Salle Street, Chicago 1, Illinois. A common, large diameter mandrel is used to drive all the tapes involved, both master and "slaves", powered by a large synchronous motor. This mandrel holds the speed of master and copies so closely that the latter are to all intents identical in length with the former, and hence pose no timing problems in broadcast use.

But the problems of tape duplication by this process do not end with the evolution of a satisfactory mechanical design. On the electronic side, the problem of providing bias for as many as ten channels means the design of an unusually high-powered bias source. Equalization problems also differ from those in a plain recorder, since the higher tape velocity which most duplication systems employ means that both low and high equalization must be designed on a wave-length basis and will therefore depart materially from that used at standard tape speeds.

Yet another very difficult problem in the tape duplication field is that which results from the fact that not all play back heads on all play back machines are always in perfect alignment! In the machine pictured, a novel arrangement has been introduced to make the duplicate tapes relatively insensitive to minor play back head misalignment.

The equipment shown is installed in the laboratory of Rawdon Smith Associates, Inc. of Washington, D. C., who developed the electronic equipment which is utilized. It has been exhaustively tested for fidelity of the duplicate to the original, for freedom from introduced harmonic distortion and, in particular, for any increase in wow produced by the duplicating process. In this latter respect, the machine is particularly successful, a matter of importance since, however insensitive the average listener may be to degraded frequency response, or even to moderate harmonic distortion, he readily perceives (even on a $10.00 radio) that his music is "canned" if sustained piano notes, for examples, have a pitch waver.

Many tapes made on this machine have now been used by broadcasters, by educational institutions and by the U. S. Army, which broadcast a Christmas message to all troops overseas by "Multitape." The most influential local radio station paid the process the most welcome compliment of all by broadcasting a 15-minute program devoted to praise of the process and its co-developers—all from the 150th "Multitape" copy of the original tape recording!

The economy of this method of tape duplication is reflected in the following price schedule, which includes the highest quality plastic-base tape (Audiotape, of course:

Number of Reels	*7" Reel*	*5" Reel*
2 - 4	$5.50	$3.30
5 - 10	4.70	2.80
11 - 50	4.40	2.65
51 - 100	4.00	2.40

Further information on this Multitape process can be obtained by writing to Rawdon Smith Associates, Inc., 2217 M Street, N.W., Washington, D. C.

audio record
VOL. 8, NO. 1 JANUARY, 1952

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Purdue University Opens New Electronic Language Laboratory

Large, Fully-equipped Laboratory is Designed to take Full Advantage of both Audio and Visual Aids in Language Study

A portion of Purdue University's new electronic language laboratory, showing 23 of the 28 semi-soundproof recorder booths with front panels lowered.

The Department of Modern Languages of Purdue University, Lafayette, Indiana has announced the opening of its new language laboratory for elementary classes, beginning this semester. This large and fully equipped laboratory marks still another addition to the roster of key educational institutions to attack the problem of improving language skills of college students.

The facilities of the laboratory will first be concentrated on students undergoing training in basic familiarization with a new language. At a later date, the facilities can be directed to training for higher academic achievement and for experimentation. The installation, entailing an expenditure of more than $15,000., was designed and equipped by Educational Laboratories, Inc., of Washington, D. C.

The main laboratory has twenty-eight semi-soundproof booths with sliding front panels which can be raised to isolate the student during intensive audio work. The booths are aligned by rows in "chevron" formation which, with the front panel lowered, facilitates viewing of the screen. Each booth is equipped with a flush-mounted custom Brush Soundmirror tape recorder, button controlled microphone and high quality earphones. Additional audio equipment includes a master tape recorder, disc recorder, radio and associated equipment and connections for piping recorded material or the instructor's living voice directly into each booth. Visual equipment includes the new Bessler opaque projector and a Speed Reader.

The switching system of the Laboratory is custom designed and permits complete flexibility in the use of the equipment. One important asset of the system is apparent in that each student is in contact with the instructor by way of his earphones for every minute of the class period. Moreover, in supplementing this electronic communication, with the individual recorders in operation the students respond to the instructor's questions and directions while the recorder makes a tape record of the voices for later comparative study. The effect is thus to eliminate a division and a spreading of the instructor's efforts over the twenty-eight students and each student participates 100% of the class period. The switching system also provides for a recorder to conduct the class, as it were, by means of a pre-recorded tape, while the instructor at the same time is auditing by earphones the responses in any booth. The instructor can cause any booth to function independently or as a master control for a variable number of its neighbors. In this way, using each row of booths as a unit, it is possible to conduct five different activities simultaneously. Students are not disturbed by events taking place which do not concern them due to the acoustical treatment of the installation and to their earphones, which command attention and narrow their concentration.

Multi-sensory impression, a potent ingredient in language learning, is achieved through use of visual material combined with oral texts, both keyed to the class work. Excellent contemporary visual material for the opaque projector is available in the nearest magazine. Neither the opaque projector nor the Speed-Reader requires total darkness for projection: enough light can be maintained to conduct opaque projector nor the Speed-Reader operates without shutter and projects printed matter at a chosen speed from very slow to very fast. The image moves upward out of vision similarly to the "leader" in an entertainment film. Incorporating visual material by projection into the laboratory system permits the student in one case to identify an unknown sound with a known object, and in another case involving reading, to associate a newly learned sound with its written equivalent in the new language.

The past two years have seen the inception of the modern language laboratory such as has been installed at Purdue, the University of Puerto Rico, Georgetown University, American University, a special project in Manila and in the United States Government. The methodology being developed in these projects is well along towards setting the standard for language teaching in our country. These new techniques where sound is used as the bridge in learning are bringing language classes back to life again, making the learning process a stimulating, exciting adventure for the students.

Audio Devices Announces Winners of Educational Recording Contest

Twenty-six Educators Awarded Prizes Totaling $275.00 in Cash, Plus $1,430.00 Worth of Audiotape

The Educational Recording Contest announced in the August-September 1951 issue of Audio Record brought in a total of more than one hundred scripts, submitted by educators in 24 States, and even from Hawaii, South America and Europe. Entries varied in length from a single sheet written in longhand to 17 typewritten pages. The applications mentioned included just about every conceivable use in practically every field of education. But they all had one thing in common — a tremendous enthusiasm for sound recording as a teaching tool.

Selecting the prize-winning scripts was a much more difficult job than our judges expected it to be. As is the case in any contest of this type, many excellent and well-deserving scripts had to be eliminated in the "Finals". We know, too, that many of the contestants will be disappointed that their entries were not selected. Frankly, we feel the same way about it. But a contest would be no contest at all if every entry received an award, and the judges had to do the best they could in evaluating all of the scripts on an equal and impartial basis. It was originally planned to award ten first prizes and ten second prizes. In view of the nature of the material submitted, this was changed to *eleven* first prizes and *fifteen* second prizes. And still a great many very fine scripts had to be passed up entirely.

To the winners, we extend our sincere congratulations. To all others who devoted their time and effort in preparing material for this contest, we wish to express our thanks and wish them the best of success in the work which they are doing so well.

All scripts were judged on the basis of the completeness of the information—its probable value to other educators — the scope of applications covered—the unusual interest of certain unique and special applications—and also, but to a lesser extent, the availability of suitable illustrative material for use with the articles when they appear in published form. All of the first and second prize-winning articles will be published in future issues of Audio Record. In addition, many of them will also be made available in convenient booklet form, to provide teachers with a complete educational recording guide that will help them to realize the full potential of this powerful new teaching tool.

A glance at the titles of the following 26 prize-winning scripts will give some idea of the wide range of applications covered, as well as the educational levels from which they originated.

FIRST AWARD WINNERS
($25 Cash plus 10 Reels of Audiotape)

1. **"Our Busy Tape Recorder"**
   by Sister Mary Agnetta,
   Band Conductor,
   Immaculate Heart of Mary Home for Children,
   Buffalo, New York

2. **"Building a Library of Radio Programs on Tape"**
   by Harold Hainfeld,
   Roosevelt School,
   Union City, New Jersey

3. **"Tape Recording in Educational Theatre"**
   by James W. Thompson,
   Yale University Drama School,
   New Haven, Connecticut

4. **"On the Listening Road to Learning"**
   by Margaret Seberger,
   Director of Research and Guidance,
   Monrovia City Schools,
   Monrovia, California

5. **"The Use of Recordings at the Berkeley Opera Workshop"**
   by John E. Meeker,
   Director of Recordings,
   Berkeley Opera Workshop,
   Berkeley, California

6. **"The Use of Audiodiscs in College Speech Classes"**
   by Clara B. Weir,
   Ithaca, New York

7. **"Every Man Heard Them Speak in His Own Language"**
   by Joseph Hocking,
   Pucallpa, Peru, South America

8. **"Tape Recording in Cardiology"**
   by J. Scott Butterworth, M.D.
   Associate Professor of Medicine,
   University Hospital,
   New York, N. Y.

9. **"A New Technique Utilizing Tape and Disc Recording in Speech Training"**
   by Duncan Whiteside,
   Director of Radio,
   University of Mississippi,
   University, Mississippi

10. **"A Syllabus of the Tape Recorder"**
    by Claude D. Bickler,
    Assistant Principal,
    Lincoln School,
    Wausau, Wisconsin

11. **"Recording Activities at Yakima Radio Workshop"**
    by Miss Murle J. Birk,
    Director of Radio Education,
    Yakima Public Schools,
    Yakima, Washington

SECOND AWARD WINNERS
(10 Reels of Audiotape)

1. **"A Precision Tool"**
   by Miss Minnie R. Moore,
   709 West 15th Street,
   Tyrone, Pennsylvania

2. **"Teaching French with Tape"**
   by Fernand L. Marty,
   Instructor in French,
   Middlebury College,
   Middlebury, Vermont

3. **"Inter University Recording"**
   by Edgar G. Will, Jr.,
   University of Hawaii,
   Honolulu, T. H.

4. **"Unusual Uses of a Recording Machine"**
   by Charles R. Morris,
   Milton Academy,
   Milton, Massachusetts

5. **"Tape Recording in Citizenship Classes"**
   by Louis Ratner,
   Teacher of English and Citizenship,
   P. S. 178,
   Brooklyn, New York

6. **"How Tape Recording Helps the Drama Instructor"**
   by Daniel Seidman,
   2 Peter Cooper Road,
   New York 10, N. Y.

7. **"How We Use Recording to Improve Our Public School Music"**
by Frank H. Groff,
Director of Music,
West Hartford Public Schools,
West Hartford, Connecticut

8. **"Making Assurance Doubly Sure"**
by Robert C. Schimmel,
Radio Coordinator,
Boston Public Schools,
Boston, Massachusetts

9. **"The Recorder in a Propaganda Unit"**
by Sidney B. Simon,
Bradford Senior High School,
Bradford, Pa.

10. **"Educational Recording"**
by Sister Mary Constance,
St. Agnes Academy,
Alliance, Nebraska

11. **"How Recorded Sound Helps Teach Anatomy and Physiology"**
by R. Dean Schick, Ph.D.,
Science Department,
State Teachers College,
Cortland, New York

12. **"Now We Tape It"**
by Worthington A. Gregory,
Director of Radio,
Sewanhaka High School,
Floral Park, New York

13. **"How Tape Recording Lightens the Teaching Load"**
by John Wall,
Del Norte Consolidated Schools,
Del Norte, Colorado

14. **"Radio Expression in Elementary Schools"**
by Armin H. Beck,
Grant School,
Decatur, Illinois

15. **"How Tape Recordings Stimulate Creative Imagination"**
by Bethel Jane Graves,
Junior High School English Teacher,
North Syracuse, New York

TAPE RECORDING IN CARDIOLOGY

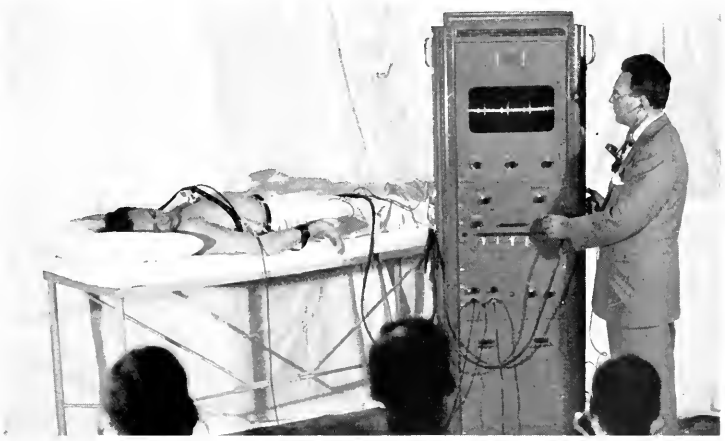
by J. Scott Butterworth, M.D.
Associate Professor of Medicine
University Hospital, New York, N.Y.

(One of the First Prize winners in the Educational Recording Contest)

The teaching of cardiology at New York Post-Graduate Medical School has posed many problems. Cardiology, or the study of heart disease, depends to a great extent upon training the sense of hearing and particularly the appreciation of low frequency sounds. For a number of years we have been engaged in developing and working with an electronic type of amplification that would exactly reproduce the sounds a physician hears through his own stethoscope. This seems rather a simple proposition but it is complicated by the fact that the frequency of the sounds produced by both normal and diseased hearts is in the low spectrum. Most of these sounds are below 200 cps and go as low as the threshold of audibilty at the intensity produced by the heart (there are many frequencies below the threshold which we do not hear).

It was formerly necessary for each student to examine a patient individually with his own stethoscope. This not only consumed a great deal of time and wasted the time of the group, but also left much to be desired as far as a teaching method was concerned since the instructor was never entirely sure of what the student was hearing.

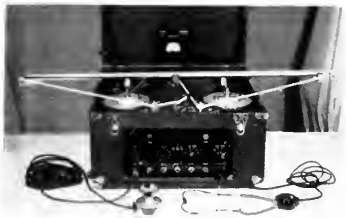
We now use a system composed of a special microphone for picking up the sounds from the patient's chest, a good amplifier flat in the low frequency range and multiple electronic stethoscopes so that an unlimited number of students may all listen at the same time (see illustration). We have found loud speakers rather unsatisfactory because of the very low frequencies which in a room that is not specially sound conditioned tend to feed back even at low intensity. With this equipment we are able to examine patients with ease, accuracy and speed and at the same time to visualize the sound at the same instant it is being heard, on a special 16 inch tube coated with a long persistent material. There are many times, however, when we do not have a patient easily available to illustrate the particular subject in which we are interested and that is where tape enters the picture.



In this typical set-up, the microphone on the patient's chest which feeds into the amplifier in the Educational Cardioscope. The output goes to the individual stethophones of the students and also to the tube of the Cardioscope. The instructor has a microphone and earphones and can talk to the group at will. The tape recorder can be used at the same time for recording the heart sounds.

We originally used discs for our records but were troubled by surface noise (which stands out much more where only lows are present) which tended to become more pronounced the longer the record was used. We turned to tape for the solution and we now have several recorders which have been adapted to the recording of heart sounds.* This requires extremely good fidelity in the range from 500 to 20 cps and the additional use of filters to accentuate certain frequencies in this range.

Over a period of time we have developed a large library of tape recordings of all types of heart sounds and murmurs so that we are no longer dependent upon the presence of an actual patient. The records may be played in continuous recordings of an hour or more with lectures and comments interspersed or endless tapes may be used to play a certain type of record endlessly until the student has had plenty of



Tape Recorder replaces the patient and the output goes to the stethophones (one illustrated) and also to the Educational Cardioscope where the sounds are visualized on the face of the special picture tube. In this illustration a continuous tape is shown in position which will play 30 seconds at $3\frac{3}{4}$" or one minute at $1\frac{7}{8}$".

time to become accustomed to the sounds. Most of the recording is done at $3\frac{3}{4}$" or $1\frac{7}{8}$", which enables us to put a lot of material on a 7 inch reel and which does not detract from the low frequency response.

This system of tape recording has many other advantages: It is easy to edit the tapes; It facilitates teaching since the record may be played as long as desired by either the instructor or the student; It produces a permanent record of a patient at a given time. The latter is most useful in following changes in the sounds of an individual patient over a period of months or years, or in illustrating the changes that occur as the result of our modern cardiac operations where certain types of cardiac murmurs may be entirely abolished by the proper surgical procedure. The field is still new and the possibilities are relatively unlimited.

* These recorders are not commercially available at present but any tape recorder having good low frequency characteristics may be adapted. Our recorders were originally developed with the fine cooperation of Mr. Jack Bieger of Tapetone Corporation.

"Every Man Heard Them Speak in His Own Language"

by Joseph Hocking
Pucallpa, Peru, S. Amer.

(Another First Prize Winner)

The arrival and development of magnetic recording has opened vast possibilities for the missionary to reach and teach illiterate Indians or Indians without a written language. Something has been done and more will be done so that the red skin seated in darkness may recieve the light as he listens rather than as he reads. The problem of illiteracy disappears when we seek to reach the uncultured through the ear-gate. Let us talk of what has been done.

We have been carrying on a campaign here in the jungle country to try and give every missionary and linguist working with primitive people an opportunity to produce a set of records presenting his messages to that group in their own language. Before tape recording became available Presto portable disc recording equipment was used here. Centers were set up as near the tribe as possible where electric current and other facilities were available or the entire equipment with a portable generator was carried or flown to the Indian center. This method was expensive and the equipment cumbersome. No matter how well coached by the missionary, the native reader would often make mistakes, spoiling blanks and adding to the expense. One native Quecha boy was very polite when he made a mistake always saying "pardon me" and then making the correction. He couldn't understand and was quite put out that we recorded his "pardon me's". Editing the tape now it is quite a simple matter to cut out the error and the "pardon me". I must someday go back and tell that boy that he can now say "pardon me" and we won't play it back.

Just as the sulfas and the biotics have simplified our medicine so the magnetic tape recording has simplified our recording problems. Now, even when traveling lightly, one can still take a tape recorder along to the tribe. For several years we have been using Brush portable equipment. Our Audiotape often comes out parcel post bringing a message from a friend or a favorite program. Sometimes the custom charges are high, sometimes the tape comes in as gummed tape or the like with little or no charge. These same tapes go back carrying Indian programs to be duplicated and returned. As the prices come down more and more workers arrive in the jungle country bringing a magnetic recorder. Recently we have seen Wilcox Gay portable equipment and Minitape brought in.

The field recordings are usually made up into three and a half minute programs. These are sent to a group in Los Angeles (Gospel Recordings Inc.) to be dubbed and a hundred or more pressings made of each. These records are sent or brought out to the Indian area to be used with suitable portable victrolas. The records are usually given to the Indians and the play back machine lent or sold below cost.

You can imagine the surprise of the Indians as they hear for the first time the box that talks their language. Some chatter like monkeys forgetting to listen. One Indian stood up and repeated word for word the message as the record was first played. Others want to add their comments to the record after it is played. Often they look around and in the box to find the voice. It is amusing to see them examine the needle and record to try and understand how it is done. One Indian jumped to his feet after the second playing calling attention to all listening that the record has said the same thing the second time it was played. He was so impressed by this that he said it must be the truth and he would believe it if it said the same thing the third time. Of course a convert was won. One Indian group traveled days to return their victrola which they said was broken. It was discovered that they had played their records till they were no longer understandable. With a new set of records their machine was fixed.

Our little wooden missionaries are untiring workers, willing to repeat their messages any number of times at any hour of the day or night. They don't mind the mosquitoes and other insects and they don't get sick from poor food and disease. They speak fluently many difficult languages. We take our hats off to them — they are doing a good job.

A linguist, James Lauriault, coaches his native informant before making a tape recording at Roaboya, Rio Ucayali, on the Upper Amazon, Peru.

Shipivo Indians listen to a phonograph record made from the tape recording in their own language. Taken at Roaboya, Peru.

audio pointers for the Recordist

By C. J. LeBel, Vice President
Audio Devices, Inc.

EDUCATIONAL RECORDING

C. J. LeBel

We have just had a most interesting several days reading the manuscripts entered in our Educational Recording Contest. Especially surprising are many of the uses to which tape recording is being put today, ranging from standard school applications to psychiatry and missionary work.

Although the total number of entries was not sufficiently great to permit drawing any hard and fast conclusions on educational level and territorial distribution, some interesting trends seem to be indicated.

Papers were submitted at all levels, with the following somewhat surprising distribution:

Elementary School	16%
Junior High School	12%
High School	37%
College	17%
Miscellaneous	18%

Based on the number of institutions in each field, one would expect a higher percentage of returns from the elementary and junior high school groups, and a lower percentage in the high school and college brackets. Since writing ability is possessed at all levels, it looks as though sound recording equipment is still too scarce in elementary and junior high schools. This, however, is a situation which is sure to correct itself as more and more educators in this group become familiar with the advantages and economy of tape recording.

When we come to the state of origin we have another surprise. Although scripts were submitted from a total of 24 states, 71 per cent came from the following group:

New York	26%
California	10%
Massachusetts	8%
New Jersey	7%
Pennsylvania	7%
Illinois	7%
Wisconsin	6%

Another way of putting it might be that only four states supplied over 50% of the replies. Are some states too slow to adopt improved techniques? Or is it that their teachers are just more reticent to talk about their accomplishments?

Finally, our analysis comes to a point which has been a pet interest of the writer: quality needs. Administrative personnel have often told him that most schools do not need high quality equipment—for very few engage in activities that require high quality results. It is therefore significant that 26% of the users have applications where quality is vital: speech correction and/or music. This does not mean that all are full time teachers of speech correction, but rather that child speech (for example) is often bad enough so that correction becomes an accompaniment to other work

Bearing in mind the number of schools which have only one recording machine, it is evident that most machines should be *capable* of good enough quality for speech correction. Yet many of the contestants are still limited in their activities by obsolete and inadequate equipment. It is indeed a tribute to their perseverance and ingenuity that they have been able to do so much with so little. We sincerely hope that these limitations will soon be removed—that their efforts will be rewarded by the purchase of recording equipment capable of performance that is commensurate with the basic minimum requirements for the job to be done. We will then see a tremendous increase in the effectiveness of sound recording in all phases of educational work.

A reprint of an article on quality requirements for educational recording, by Mr. LeBel, is available from Audio Devices, Inc. on request.

NEW SELF-TIMING LEADER TAPE ON PLASTIC BASE

Audio Devices, Inc., has now perfected an improved, self-timing leader tape made of a strong, durable white plastic material. It can easily be marked with pencil or ink to identify selections and will outlast paper tapes many times over. Used with standard ¼-inch magnetic recording tape, it offers the following advantages.

Saves Recording Tape — leaders at beginning and end of reel permit full length of magnetic tape to be used for recording.

Protects Recording Tape — outer wrap of leader tape protects outer turns of magnetic tape from accidental damage.

Easy Identification — marked leader tape between selections on a reel permits quick spotting of any desired material.

Accurate Timing — the words "Audiotape" are spaced exactly 7½ inches apart, providing a simple and accurate method of timing at all standard tape speeds.

Audio Self-Timing Leader Tape is available in 150-foot rolls, individually packaged in a self-dispensing container for easy use. List Price, 60 cents per roll.

What is a CHIP CHASER?

Several people have asked us this question, after seeing a reference to it in a recent Audio Record Article.

Briefly, the Audiodisc Chip Chaser is a simple and effective device for keeping the thread out of the way of the stylus when recording outside-in. It has a heavy base which is placed beside the turntable and requires no fastening down or adjusting. The wiper blade is set on the disc before starting the recording.

It automatically and infallibly brushes the thread toward the center of the disc where it winds up on the center post or drive pins, without any danger of fouling the stylus. Once in place, it operates without attention — fits any machine — is self-adjusting — and tips up out of the way when not in use. The blade cannot scratch or damage the disc surface.

Two sizes are available from your Audiodisc dealer:

For up to 12" Turntable	$5.00 List Each
For up to 16" Turntable	6.25 List Each

They bring true listening enjoyment to millions—through the finest in modern sound recording methods and equipment

RCA Victor's modern Vinylite phonograph records are infinitely superior to the old shellac pressings of a few years ago. Better in tone quality, distortion, surface noise and frequency range. This improvement in quality requires more precision than ever before in every step of record manufacture and processing. That's particularly true of the original sound recording and the master discs from which the stampers are made. And RCA Victor has found that Audiotape and Audiodiscs are an ideal combination to meet the exacting demands for today's high fidelity phonograph records — Audiotape for clearest recording of the original sound and Audiodiscs for fast, easy processing without loss of sound quality. In fact this record-making combination is now being used with outstanding success by America's *leading producers* of fine phonograph records and broadcast transcriptions.

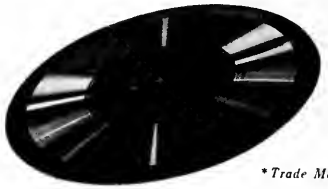
Whatever *your* recording work may be, Audiotape and Audiodiscs offer you this same sound perfection — the result of more than 12 years of specialized experience by the only company in America devoted solely to the manufacture of fine sound recording media, both discs and tape.

444 MADISON AVE., NEW YORK 22, N. Y.
Export Dept.: 13 East 40th St., New York 16, N. Y., Cables "ARLAB"

. . . including

for the original sound

. . . and
for the master recording



** Trade Mark*

February 1952. Vol. 8, No. 2

Published by
AUDIO DEVICES, INC.
444 MADISON AVENUE, N. Y. 22, N. Y.

audiodiscs
audiotape
audiofilm
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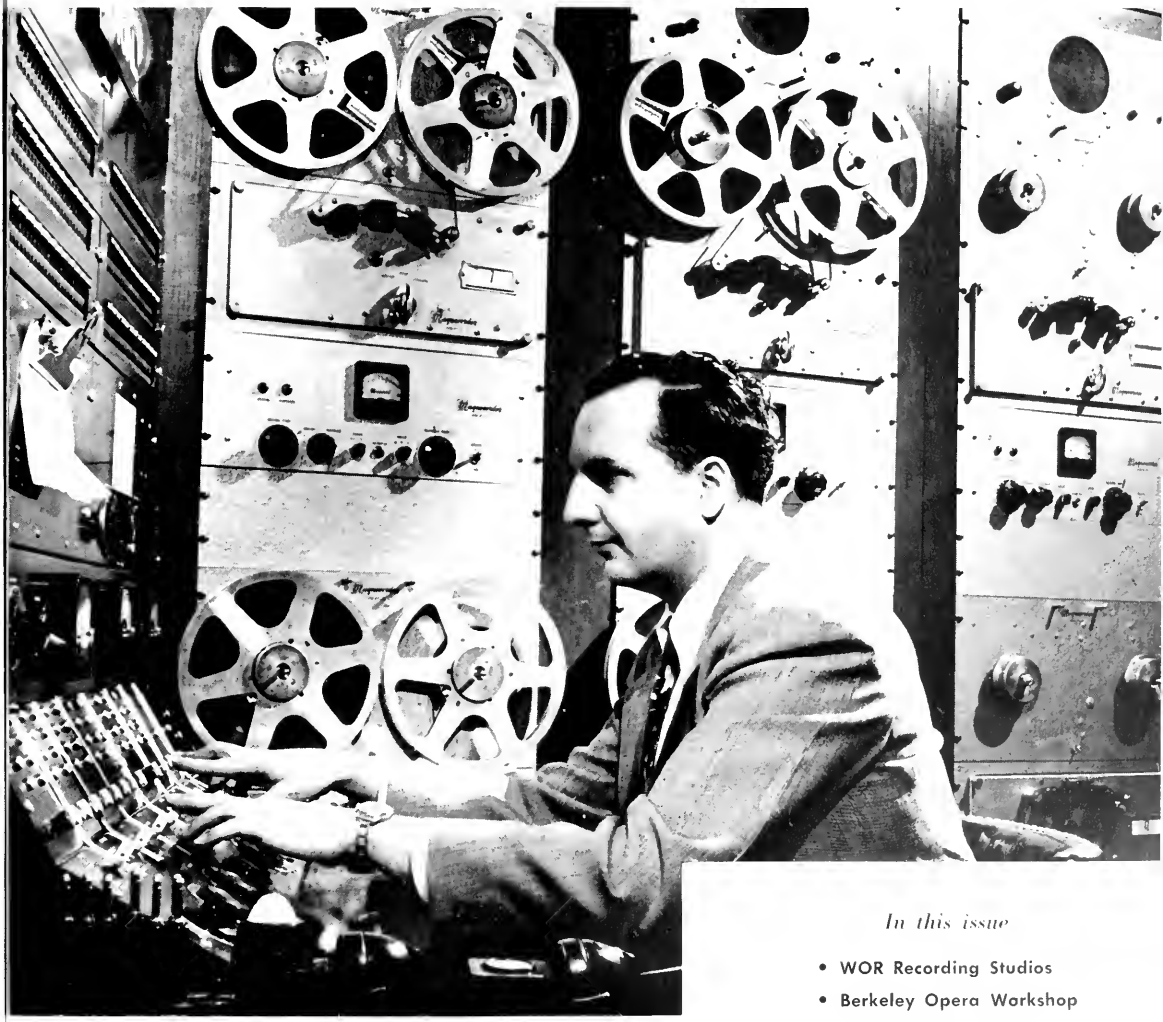


A portion of the "Mutual Room" at WOR Recording Studios, showing 6 of the 12 rack-mounted Magnecorders and the specially designed central control panel for all machines. Here every Mutual program is taped and re-transmitted one hour later during daylight saving time. Story on Page 2.

In this issue

A World Of Recording at WOR

Here, in one of the country's largest and most modern sound studios, discs and tape now share the recording load on a 50-50 basis.

When you enter the WOR Recording Studios at 1440 Broadway in New York City, you enter a realm apart from the mad hubbub of the metropolis—a quiet, busy little world where sound is king. Yet, far from being isolated from the outside world, these studios are a veritable nerve center of New York's vast communications system—and programs recorded here are heard throughout the nation and even in the far corners of the world.

If you're looking for the finest in modern sound recording methods and equipment, you'll find them at WOR. And if you're interested in knowing just how far magnetic tape has revolutionized the recording industry, you'll find the answer at WOR, too. For here, in one of America's largest sound recording organizations, you can see the result of *ten years* of audio evolution.

The WOR Recording Studios were opened in 1942—with a full complement of what was at that time the finest disc recording equipment obtainable. For the next six years the entire operation was on a disc basis. Then, in 1948, tape entered the picture. It was at first tried out on an experimental basis, but later on, as the quality of both the tape and the recording equipment was improved, this phase of the operation grew rapidly in importance. And today, the recording work done here is about equally divided between discs and tape. During this period of evolution, the disc recording end of the business did not remain static either. For as quickly as improvements in disc equipment were made available, they were put into use at WOR, to keep the quality of the recorded sound at the highest level obtainable.

The combined tape and disc equipment now being used at WOR includes 12 Ampex tape recorders, 3 Rangertone tape recorders, 14 Magnecorder tape recorders, 8 Scully disc lathes, 12 Presto reference disc recorders and RCA and Fairchild transcription turntables.

There are nineteen different studios, including a theatre, each wired to a central control switchboard which connects any desired recorder combination to any studio at any time. But "four walls do not a prison make"—and the WOR recording facilities are not limited to the studios at 1440 Broadway. By means of direct lines or connections through a central exchange, the WOR studios can make recordings of programs originating in practically any metropolitan radio station or remote point—including the Mutual Broadcasting System, The American Broadcasting Company, The Columbia Broadcasting System, Stations WNEW, WNYC, WINS and WMGM. Specially developed receiving equipment is also installed to permit off-the-air recording of the audio portion of any AM, FM or TV program material.

A quick look at some of the recording rooms will be of particular interest to our professional readers.

In the so-called "mutual room", there is an impressive array of twelve rack-mounted Magnecorder tape machines with a specially designed control console which puts the operation of the entire setup at the fingertips of the engineer in charge. This exceptionally large tape installation was designed to handle the Daylight Saving Time requirements of the Mutual Broadcasting System. From April to September, this equipment operates continuously 16 hours a day, 7 days a week, taping every Mutual program as it is aired and re-transmitting it one hour later. The taped programs are sent by wire line to local MBS stations in various part of the country where the later time coincides with local broadcasting schedules. Each program is recorded on duplicate tapes, and during playback, the two tapes are run simultaneously in synchronism, so that, in the event of a failure in any one machine, the other can be switched in instantly without any break in the program. This operation requires the use of about one million feet of tape.

The large Reference Recording Room contains a bank of 12 Presto disc lathes, designed primarily for air checks, line checks, and broadcast reference recordings. The equipment in this recording room also includes rack-mounted tape recording ma-

Ralph Schlegel, Recording Supervisor, at the control console in one of WOR's many sound-proof, air-conditioned recording rooms. A Rangertone tape recorder is shown in the foreground.

audio record
VOL. 8, NO. 2 FEBRUARY, 1952

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

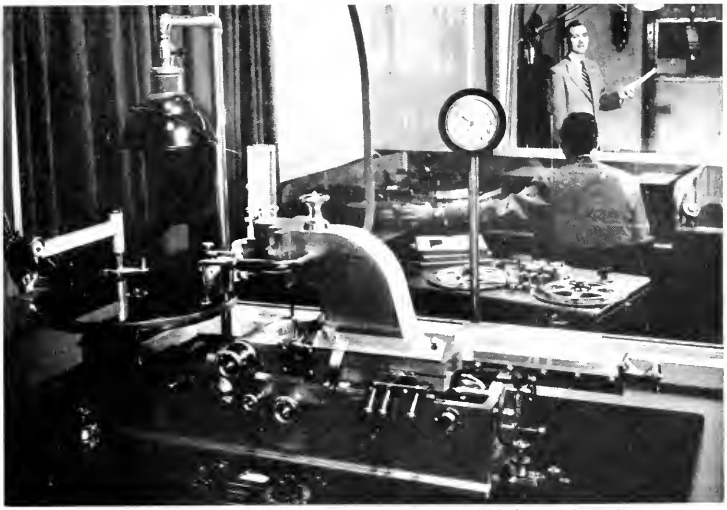
chines. Here, also, is the master control switchboard, with provision for connecting any recorder or combination of recorders to any of the 19 WOR recording studios as well as to practically any AM, FM or TV radio station in the metropolitan area.

The Central Cutting Room for tape includes four Ampex console type machines, with complete facilities for program feeds and tape editing. This extremely flexible setup makes it a simple matter to mix two tapes and record them on a third—combine any desired selections from two or more tapes on to a single, splice-free reel, etc.

In Studio C, a so-called workshop studio, is a unique, two-turntable re-recording console, designed by WOR recording engineers for the quality improvement of records or transcriptions submitted by clients. By means of complex equalizing networks and frequency-selective pre-emphasis and volume suppression, weird and wonderful things can be done to bring out the hidden quality of a disc recording—or, in other words, to make a "copy" the quality of which is actually far superior to the original record.

For cutting phonograph and transcription masters, only the finest Scully Lathes are used—including two fully automatic machines with continuously variable pitch and pre-selective push-button control of all disc recording functions. At the touch of a button, these machines will automatically perform every cycle of operation, from starting the turntable and lowering the cutter to tracing the center spiral control groove, thus eliminating the possibility of human error from this mechanical phase of master disc production.

Mr. Ralph Schlegel, WOR's Recording Supervisor, believes that the studio's operation as carried on today, with a fairly equal division of load between tape and disc recording, is pretty well stabilized, and will continue on that basis for a long time to come. In his opinion, the lacquer disc still represents the finest available medium for top quality recording and reproduction and for permanent storage of valuable recordings. Tape, on the other hand, with its easy editing and very high quality standards, is the preferable medium for many types of recording work carried on in any large studio operation. Many clients prefer to use tape, even though the cost for a given program time is considerably higher largely because changes and corrections can be made so easily after the recording is completed.

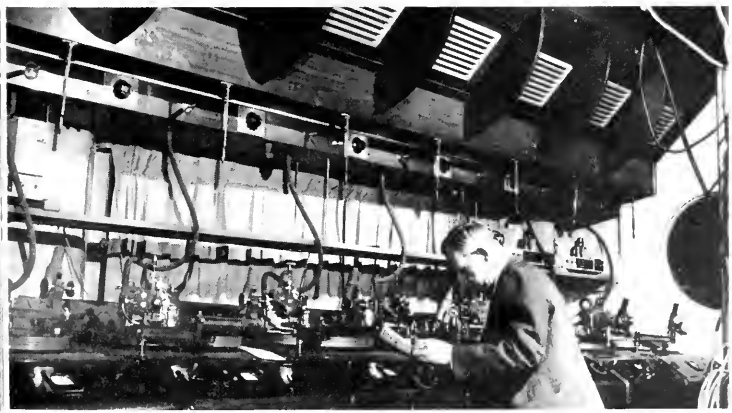


A typical WOR recording room setup, looking from disc cutting room (with Scully lathe in foreground) into glassed-in control room (with Rangertone tape machine) and into the studio beyond.

Where previously double discs were cut on every recording, it is now the usual practice to make one disc and one tape. Sometimes double tapes are made, with no disc recording at all. Tape recordings at WOR are made at $7\frac{1}{2}$, 15 or 30 inch speed, with about 90 per cent of the work done at 15 inches per second. Studios and equipment for making high fidelity sound on film, with complete services for advertising agencies and TV producers are now being planned.

Mr. N. B. Lockwood, Manager, and Mr. John Hayes, Assistant Manager, explain that WOR's clients include practically all of the major advertising agencies

(*Continued on Page 6*)



A group of seven of the twelve Presto disc recorders in WOR's large reference recording room, where air checks, line checks and broadcast reference recordings are made.

This is WOR's specially designed re-recording console, with which it is possible to make disc "copies" which are actually superior in quality to the original.

by John E. Meeker
Director of Recordings
Berkeley Opera Workshop
Berkeley, California

(One of the eleven first-prize winning entries in Audio Devices' educational recording contest.)

The Berkeley Opera Workshop is a function of the Berkeley Adult Evening School which aims to provide a class for those persons who are interested in singing in an opera production or playing in the orchestra for the production. It has as its chief purpose the provision of a place where practical experience may be had in singing opera music, either as a member of the chorus or as a principal. Members of the group are given a chance to try singing the leading roles during class sessions and any who feel up to it may have a chance to sing a leading role in one of the actual performances the group stages for the public. It is hoped that eventually the group will be able to organize a stagecraft and costume section to supplement the musical sections. In that way it will be possible to overcome some of the financial problems involved in staging an opera.

At the moment the group is rather small but those who come are very much interested in it and we are planning on putting on a production in the near future. Meetings are held twice a week in the new music building the Berkeley High School completed last year. For our productions we have available the complete facilities of either the large community theater with its great stage or the small Little Theater which is more compact.

The use of recordings in conjunction with the activities of the Opera Workshop consists in making spot checks of rehearsals and complete recordings of performances given on the stage. Both of these uses give the members of the group an opportunity to hear themselves in action. The original recordings are made on Audiotape and disc copies of excerpts are available to those who wish them. A nominal charge is made for the discs to cover cost of materials used. A master copy of each complete recording is copied onto discs to be filed as a permanent record of the group's accomplishments.

Typical recording setup as used for making rehearsal tests during class session of the Berkeley Opera Workshop. Equipment shown includes two portable Magnecorders and separate amplifier chassis.

The recording equipment is furnished by one of the members of the group who is operating a more or less non-profit recording service and is very much interested in the activities of the Opera Workshop and in educational recording for music students. The tape recorders are Magnecord PT6-AH units operated from a custom built recording amplifier. The amplifier has facilities for mixing three mikes and is also equipped to dub from tape to tape. The present disc recorder is a Presto 6-N machine which is used for making the disc copies of tape recordings. All original recordings are made on tape and then copied onto discs. The tape machines are equipped with carrying cases and a changeover switch for continuous recording on location. An accessory gadget that has been picked up is a small hand crank which fits over the spindle and into the slots on the tape reels. This simplifies hand rewinding during a performance when the recorders are in a position which would make use of the motor rewind out of the question due to the noise produced. We find it simpler to keep track of the sequence of reels if they are rewound immediately. A tape speed of fifteen inches per second is used when recording for the Workshop and that allows fifteen minutes in which to rewind the reel and place the new reel on the machine ready for operation. It has also been found that the noise of rewinding by motor gets picked up by the other tape when recording.

When the equipment is used at the class sessions for making spot recordings of the rehearsal, the recorders are set up at the rear of the classroom on portable folding tables and positioned so that the operator can watch the director of the class and

receive instructions from him as to what and when to record. The mike is placed on a boom and put in a front-center position where it will give reasonably adequate pickup of the singers and piano. With a small group it is simpler to figure out the mike placement than it is with a larger group due to the fact that the larger the group the more spread out it will be in a sideways direction. The speaker for playback is placed in a suitable spot at the front of the room where it will be heard by all the members of the group. In actual operation the director of the group requests that specified portions of the music be recorded and then played back immediately. During playback he will point out any special items that he wishes to bring to the attention of the class. In this the class hears itself as a group and the individuals can find out if they are blending in with the whole group or not.

During the past year, two complete opera productions have been staged by the class in the big community theater which will seat three thousand persons. Complete recordings were made of each production and the results were quite good, especially for a first attempt. The first production was Aida and it provided an excellent opportunity to find out by trial and error how to record a live opera complete with chorus, orchestra and principals. The mike placement was figured out by guesswork plus a bit of semi-experiment at the dress rehearsal. For this opera the mike was hung from the spotlight bridge approximately over the center front of the stage just back of the main curtain. There was no practical way of stringing the mike in front of the curtain and it was also desired to keep the orchestra from drowning out the chorus and soloists. Experimental recordings made during the dress rehearsal provided some idea of how well the orchestra would be picked up from a position near the footlights. The mike was about fifteen feet above the stage floor which was a prominent position. However, there were three other mikes hanging at the same level to provide p.a. reinforcement when needed so the "looks" factor was put aside for this production. The results achieved with this mike placement were sufficiently good to warrant its continuance with slight modifications at the next opera production. The second opera we staged was Die Fledermaus and it had a feature which Aida had not had. This time there was spoken dialogue to record as well as music. The mike was again hung from the spotlight bridge but this time it was placed so that it would be as inconspicuous as possible. The mike barely protruded beyond the edge of the horizontal border fringe that formed the top border of the main curtain. This put it about thirty feet above the stage floor and yet there was still plenty of reserve gain during the singing. The mike used was an Electro-Voice dynamic microphone (model 635) which was suspended vertically facing the floor of the stage. This position provided a 360 degree angle of pickup and resulted in surprisingly good balance between singers and orchestra. The only other mikes we had available were velocity type instruments which nullified their usefulness since they reinforced the orchestra as well as the singers. When we have the necessary equipment we will place two cardiod type mikes in the footlights to pick up the action at stage right and stage left. That will give better results when the principals are off at the edges of the stage and at a great distance from the central mike. However, the one mike did remarkably well most of the time with only two or three places where the sound quality was not as good as it should have been. In the Little Theater the distances will be much smaller which will simplify things greatly.

The recordings of the show were played back for the class soon after the weekend of the performance and they thus had a chance to hear how they had actually sounded. Of course, the balance between orchestra and singers was not the same on the recordings as it was to those sitting in the audience but we did not aim to duplicate that particular set of conditions. In fact, the balance on the recordings was better than that out in the audience. All members of the group who wanted disc copies of portions of the show were given an opportunity to order what they wished and before the tapes are re-used a master copy will be made for the class files.

It is hoped that in the near future we will be able to make spot checks of the orchestra rehearsals as well as continuing with the chorus rehearsal checks. We find that this procedure is of great help in smoothing out rough spots in the blend of the ensemble since the members of the group can hear for themselves what they sound like in combination with other voices. While singing they are primarily conscious of their own performance and perhaps the performance of the person next to them but find it difficult to achieve an adequate conception of the total sound produced by the group. The playback of the tape shows them how they are related to the other singers and whether or not they stand out too strongly as individual voices when it is desired to produce a smooth blend of composite voices. All musicians should have periodic practice recordings made so that they may study their performances and spot the little flaws that may not be very noticeable during the actual performance. A recording gives a permanent record of a fleeting sound and can be given close study under relaxed conditions with a resulting improvement in technique and interpretation. We of the Opera Workshop are thoroughly convinced of the importance and practical value of high quality recordings as an aid to the study of music and the performance of music.

AND HERE'S THE "PAYOFF"

Author John Meeker (right) finds that the preparation of this first-prize winning article was quite profitable. Here he receives his $25 check from Miss Florence Erikson of Photo and Sound Co., Audio Devices' distributor in San Francisco. Mr. Charles N. Meyer of the W. C. Hitt Co., one of Audio's Factory Representatives, stands ready to award the additional prize of 10 reels of plastic base Audiotape.

RADIO STATION SURVEY SHOWS IMPORTANT TRENDS IN USE OF TAPE AND DISC RECORDINGS

78% of stations use discs — Audiodiscs leading by a 3-to-1 margin

98% of stations use tape — Audiotape gaining rapidly in popularity

Audio Devices, Inc. has just completed a nation-wide survey among radio stations to determine:

1. The extent to which broadcasting stations use recording discs and magnetic tape.
2. How AUDIODISCS and AUDIOTAPE compare in popularity with other makes of discs and tape.

A brief questionnaire was sent to 2,319 radio stations and replies were received from 1,527 of them—a return of 66%. The following questions were asked:

Do you use recording discs? Yes.... No....
If yes, is the brand AUDIODISCS.... Or other make....?
Do you use magnetic recording tape? Yes.... No....
Is the brand AUDIOTAPE.... Or other make....?

The replies revealed that 78% of the stations use recording discs in their work and 98% use magnetic recording tape.

Of those using recording discs, 85% use AUDIODISCS either exclusively or with other brands — 63% use AUDIODISCS exclusively — and only 15% use other makes exclusively.

Of those using tape, 63% use AUDIOTAPE either exclusively or with other brands — 25% use AUDIOTAPE exclusively — and 37% use other tapes exclusively.

To give an impartial basis of comparison and eliminate overlapping percentages, a "point system" of scoring was applied to these figures, counting one point for every station where AUDIODISCS or other makes of discs are used *exclusively*, and ½ point for each station where *both* are used. This indicates a 74% use of AUDIODISCS as compared to 26% for all other makes of discs combined.

A similar calculation for tape shows a volume of 44% for AUDIOTAPE as compared with a total of 56% for all other makes of tape combined.

A detailed breakdown of results from this survey is given in the following tabulation:

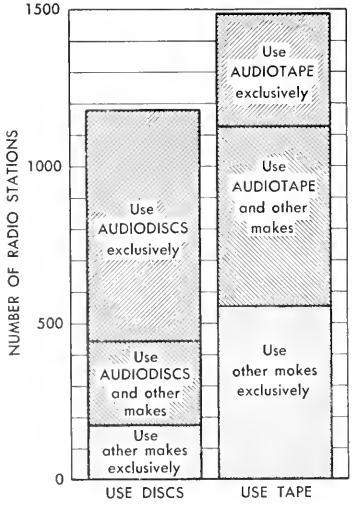
		%
No. of Stations	2,319	—
No. of Replies	1,527	66
Use Discs	1,193	78
Use AUDIODISCS	1,018	85
Use other discs	446	37
Use AUDIODISCS exclusively	747	63
Use other discs exclusively	175	15
Use magnetic tape	1,496	98
Use AUDIOTAPE	943	63
Use other tapes	1,122	75
Use AUDIOTAPE exclusively	374	25
Use other tapes exclusively	553	37

Reliability of Survey

It will be noted that questionnaires were sent to all radio stations, and replies received from 66%—a very high proportion in any survey. Further, the calculations on volume, as previously mentioned of 74% for AUDIODISCS and 26% for all other makes, check very closely with several previous surveys made in the past few years.

In the case of AUDIOTAPE, the volume of 44%, as compared to all other makes, is most encouraging since AUDIOTAPE has only been on the market half as long as some other brands.

The survey figures by sales territories also check very closely with previously known facts with reference to these territories.



WOR Recording Studios

(*Continued from Page 3*)

in New York, and that their radio and TV commercials and transcribed programs constitute a large part of the work carried on here. Fund raising organizations, slide film companies, and independent phonograph record companies also account for an important share of the recording work. He also states that the majority of pressings used throughout the country bear the familiar WOR label—which has come to be accepted as a mark of quality recording in radio stations throughout the country. WOR offers its clients a *complete* recording service—including studio rental, tape recording, disc recording, phonograph record and transcription masters and pressings. They take full responsibility for the entire job, even to the extent of maintaining inventories of pressings and taking care of all shipments and deliveries as requested.

One very large tape recording operation which is carried on here is of particular interest and world-wide significance right now. That is the recording of all program material for Radio Free Europe—an organization which operates a group of radio transmitters situated in Europe on the "free" side of the Iron Curtain. These stations beam their programs directly into "Behind the Iron Curtain" countries, giving them a true picture of what's going on in the outside world. This is an all-tape operation and WOR records all of the material in many different foreign languages. The recorded tapes are flown overseas for local broadcast by the Radio Free Europe stations.

It can therefore truly be said that the sound recordings made at WOR are heard around the world.

Another view of the WOR "Mutual Room" shown on this month's cover. This installation includes a bank of 12 rack-mounted Magnecorders, 6 on each side of the control console shown above.

audio pointers for the Recordist

by C. J. LeBel, Vice President
Audio Devices, Inc.

OVERLOOKED RESULT OF HEAD WEAR

C. J. LeBel

Users of magnetic recorders have paid insufficient attention to the heads of their machines. Conventionally, loss of high frequency response has been taken as the sole indication of head wear, and a more serious effect (grooving) has been ignored.

Wear and High Frequency Response

Whenever two surfaces rub (as in an automobile engine) wear results after a time. The tape chemist formulates a lubricant into the binder material, or puts a little on the tape surface, and thereby minimizes the wear, but he cannot prevent it completely any more than an engine can run forever without repair. The tape must touch the heads' surface, after all, or a disastrous loss of high frequency response will occur, so the lubricating layer can be of only molecular thickness. The loss of head high frequency response results from the effect shown in figure No. 1. Note the increase in gap length of the worn head.

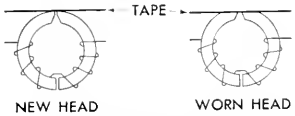


Fig. 1. Diagram showing how continued head wear increases effective slot width, with corresponding loss of high-frequency response.

Grooving

The effect we wish to consider here is much more rapid than gap length increase, and results principally from the high precision with which tape and machines must be built. Although the RTMA standard for tape width permits a range of .244" to .250", we try to hold it within a range of variating of .001" to .002". The conscientious machine manufacturer in turn tries to guide the tape path very accurately. As a result, a groove is worn in the head, as shown in exaggerated form in figure No. 2. Nevertheless, the accurate width and guiding cannot be sacrificed, for otherwise azimuth error could occur, leading to an erratic loss of high frequency response.

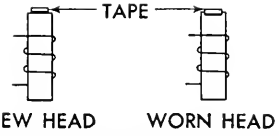


Fig. 2. Edge-wise view of the same two heads shown in Fig. 1, illustrating the groove which has been worn into the second head.

In figure No. 3, we have magnified the tape thickness enough so that wear effects are more apparent, and in figure No. 4 we show the effect of normal variation in tape width. If the tape is wider than the groove, loss of high frequency response and signs of poor motion occur, at their worst when the tape is only very slightly wider than the groove.

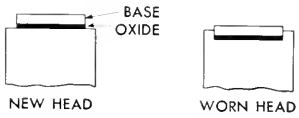


Fig. 3. Enlarged view of heads shown in Fig. 2, better illustrating the grooving effect of normal head wear. In this and the following sketches, relative base and oxide thickness are exaggerated for clarity, and are not in their true proportions.

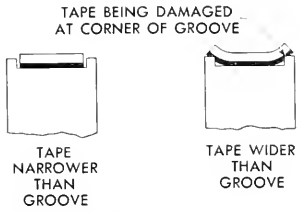


Fig. 4. Diagram of worn heads showing the effects of normal variation in tape width.

It is apparent that if we could use narrower tape after the groove were cut, a temporary improvement would occur (but only until a narrower groove were cut as in figure No. 5). In fact, a brief competitive advantage might accrue to the manufacturer who disregarded standards and reduced his tape width by .002" per month. If this kept up, every machine would need narrower guides every few months, and we would have ⅛ inch wide tape in about five years! One manufacturer actually tried this last year, until forcibly dissuaded, but an engineering remedy would be preferable.

Fig. 5. Diagram showing two consecutive stages of head wear resulting from the use of successively narrower tape widths.

Remedies

The easiest remedy would be to replace the heads whenever they show signs of grooving. Another remedy is available, but it must be used with the greatest of caution: This is to lap the head surfaces flat once more with a very fine abrasive stone. In our laboratory quality control section, heads are used day in and day out for tape uniformity tests, so our toolmaker uses a very lightly oiled Arkansas stone. Perhaps a Belgian water stone might be finer and less risky in unskilled hands.

A Precaution

If you do choose to use an abrasive, do check frequency response before and after stoning. If you have too heavy a hand, equalizer readjustment may be necessary, and in the extreme the head may be ruined.

If we may anticipate the obvious question, yes, machines differ greatly in rate of head wear. Different makes are most different, but successive heads from the same manufacturer will not wear equally. Tape tension, angle of wrap, guiding accuracy, and hardness of metal all have their effect.

Since smooth surfaces wear less, it is important that the tape surface be smooth. While all tapes become smooth after some use, many organizations do not use a given tape enough times to polish it, and the smoothness when brand new becomes significant. For this reason, AUDIOTAPE is given a special polishing before shipment. Thus the surface is smooth right from the beginning, which also stabilizes the frequency response of the tape.

If you stone your heads, be sure to use the lightest touch possible. You are trying to remove only a few thousandths of an inch and a modern stone cuts fast.

Any Questions?

If there's anything that's puzzling you about the technical aspects or operational procedure involved in your tape or disc recording work, just drop us a line.

Our staff of recording experts will be glad to give you the answer—without obligation, of course. Questions and answers published in Audio Record won't mention any names, so don't be bashful. Address your questions to: Editor, Audio Record, 444 Madison Ave., New York 22, N. Y.

mean maximum **L***istening* **P***leasure*

—thanks to the finest in modern sound recording methods and equipment

Music lovers everywhere know that Columbia LP records mean more listening pleasure—not in playing time alone, but in superb quality of reproduction. Yet few listeners outside the professional circle realize the degree of perfection which this record quality requires in every step of manufacture and processing. Take the original sound recordings and the processing masters, for example. Frequency response, signal-to-noise ratio, distortion and surface noise must measure up to standards which would have seemed entirely impractical a few years ago. But Columbia has found that Audiotape and Audiodiscs are an ideal combination for meeting all of these exacting requirements — Audiotape for recording the original sound and Audiodiscs for the masters from which stampers are made. In fact this same record-making combination is now being used with outstanding success by America's leading producers of fine phonograph records and broadcast transcriptions.

You can get this same sound perfection in *your* recording work, too — with Audiodiscs and Audiotape. Their superior quality is the result of more than 12 years of specialized experience by the only company in America devoted solely to the manufacture of fine sound recording media, both tape and discs.

℗ The exclusive trade-mark of Columbia Long Playing Records—symbol of highest quality. Trade-Marks "Columbia," "Masterworks," ℗L. ® Reg. U. S. Pat. Off. Marcas Registradas.

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for the original sound

. . . and

for the master recording

**Trade Mark*

March 1952, Vol. 8, No. 3

Published by
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audiodiscs
audiotape
audiofilm
audiopoints

Multiple recorder set-up for duplication of recorded tapes at Recorded Publications Laboratories, Camden, N. J. Story on Page 2.

In this issue

"IT'S TIME TO GO ON RECORD"

This appropriate slogan keynotes the fast growing operation of Recorded Publications Laboratories

Recorded Publications Laboratories at 61 South 6th Street, Camden, New Jersey symbolizes the gigantic growth of the recording field with the modern development of tape recording. Here, in the city where the phonograph record industry was virtually born and developed, is found this modern recording laboratory specially established to service the tape and acetate re-recording needs of recordists throughout the nation.

A stop at the Recorded Publications Laboratories receiving and shipping department vividly demonstrates the magnitude of professional — and non-professional — recordings that are now being made in the United States. Tape and disc recorded materials arrive daily from radio stations, program producers, advertising agencies, syndicates and networks, and recording studios for editing, programming and reproduction. Then too, one will observe the inflow of non-professional recorded materials from educational, church, fraternal and civic groups as well as from the individual recording enthusiasts.

Continuing through the actual recording laboratories, you immediately realize why discriminating, quality-minded recording services avail themselves of these modern complete facilities. Emphasis is placed throughout on quality in equipment and engineering with the consequent development of a superior end product.

One section is devoted completely to multiple tape duplication of one, a hundred, or any number of exact copies. This unique Ampex installation is specially engineered and designed for mass duplication work with amazing precision and economy. Flexibility, too, is most amazing in that both full and twin track recordings in any of the standard speeds can be reproduced and duplicated in any combination.

Of equal importance is the disc recording section equipped with the finest equipment obtainable for tape to disc and disc to disc cutting. Fairchild lathes and cutting heads equipped with marginal control, thermo-stylus and radius equalization assure the highest fidelity with fullest frequency range and minimum surface noise. This installation provides to the outside recordist quality equipment with skilled engineers and technicians capable of producing both microgroove and standard groove acetates for master or instantaneous use.

Behind this modern laboratory is an organization with years of experience in the industry. Dave Goodman, with an engineering degree from Rensselaer Poly and many years with RCA Victor, joined with Ed Goodman, holding a degree and wide experience in merchandising and sales management, to form Recorded Publications Company for the purposes of promoting successful application of the then new magnetic recording field. In charge of technical and operational activities is Jim Stewart, who adds to the organization his long experience in recording and major net-work broadcast engineering.

At the outset, Recorded Publications developed a completely self-contained remote tape-recording unit capable of economically traveling anywhere in the nation. These units were designed and equipped to overcome the varying conditions of almost any selected recording site. From the beginning these units were designed to include such full recording studio facilities as high-fidelity multiple input mixing, audition-monitor, play-back, cuing, operational signal system, etc. This equipment has been continuously modernized to keep pace with the latest improvements and to constantly reach for maximum quality in recording. Staffed by skilled and experienced producer-engineers each unit capably produces professional quality recordings for final custom publication of complete phonograph record album sets.

Typical of the college, church and civic groups recorded on one recent Recorded Publications itinerary — a combined band and glee club in Virginia—a forty voice church choir in Tennessee — a seventy voiced mixed a capella choir in Arkansas— an eighty piece concert band in Nebraska— a vocal group with full symphony in Iowa —and a college men's glee club in Michigan.

Thus for the first time, such distantly located groups today are successfully realizing profits and prestige from the merchandising of these professionally produced and published record albums.

In conjunction with on location recording, Recorded Publications includes a complete custom publishing service, handling every minute detail of design, manufacture, copyright, taxes and sales promotion assistance for both records and albums. Today, this organization is acknowledged to be America's leading publisher of custom

James S. Stewart, Chief Engineer of Recorded Publications Laboratories, cutting a phonograph record master on one of the Fairchild variable pitch lathes with Thermo-Stylus.

audio record
VOL. 8, NO. 3 MARCH, 1952

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

phonograph records and albums, and thousands of their shining-gleaming cellophane wrapped album sets are shipped to distant points throughout the nation.

The laboratory has applied its facilities to provide "Off-the-Air" recording and monitor service to the entire Metropolitan Philadelphia area. Programs picked-up through Meissner AM-FM Tuners are faithfully reproduced in perfect detail on tape or acetate, thus making available an additional service to broadcast stations and advertising agencies serving the Philadelphia-South Jersey area.

As Ed Goodman says, "The growth of Recorded Publications Company and Recorded Publications Laboratories is proof of the tremendous future in the tape recording field. For example, our laboratories today have entered such new fields as the duplication of college lectures and instructional materials, church services, rites and ceremonials for fraternal organizations, advertising messages for public address and broadcast. New uses of tape are being developed daily and these are sent to us for our exacting laboratory true reproduction on tape, acetate or pressing."

At Recorded Publications Laboratories, a reel of recording tape is likened to a photographer's negative. Just as a photographer imprints an interesting visual subject upon his plates, so the modern tape recordist captures "audio shots". Now, with the development of the many facilities of the Recorded Publications Laboratories, modern reproduction on a quality level can be obtained for the duplication of tapes on either acetate or tape with the same ease and practicality that a photographer obtains in the custom finishing of his prints.

A note to the Recorded Publications Laboratories, 61 South 6th Street, Camden 3, New Jersey, will place at your disposal the highest quality equipment and engineering facilities for the re-recording of your tapes and acetates. Their engineering staff will be happy to assist you in any recording and reproduction problems with which you may be faced and their experience can be converted to your profit in finer quality reproduction work.

David H. Goodman (left) and Edward J. Goodman—co-owners of Recorded Publications Laboratories—discuss some of their recent albums of college and university music.

Dave Goodman (left) and a Recorded Publications engineer keep a watchful eye on the VU meters while cutting a tape in the Remote Recording Control Room.

"THEY HAVE EARS, BUT THEY HEAR NOT"

by Bethel Jane Graves
109 Wells Avenue
North Syracuse, New York

(One of the second award winning entries in Audio Devices' Educational Recording Contest)

"They have ears, but they hear not" is a quotation which is unfortunately quite true of most pupils of junior high age.

I am a junior high English teacher in a large centralized school. I believe that children's learning to listen attentively, intelligently, and critically is a very important preparation for their future living. I also believe that another phase of good listening should encourage resourceful, imaginative young minds to do creative work—in writing, in my case.

And here is one way I use the Wilcox-Gay 7½"/sec. tape recorder:

I record various everyday sounds around the school or around the home. These may be the swish of the janitor's broom, the clanking of instruments going back into the cases after band practice, the zip of a window curtain, the buzz of the shop saw, the fizzing of an effervescent science experiment, and so on.

I play these sounds back, either one sound at a time or in groups, to the students in my English classes. I then ask the students to let their imaginations create a fantasy and then write for me the story or mood the sounds have suggested to them. We like to decide later who has written the best story.

Very seldom can these isolated sounds be identified by the listeners and the entire class is more than excited to see what the other persons have written. We hear many pupils read their own compositions to us and then we listen to the sounds again. It is such fun to hear their spontaneous laughter when they are told exactly what created each sound.

The problem of motivating a class to write on an imaginary theme is replaced by a sort of splendid game which controls the attention and curiosity of every child.

The learning skills are evident: (a) more efficient listening habits, (b) better compositions — because they know the other pupils will be listening to them read their stories, (c) speech and oral reading practice, (d) friendly competitive spirit in the game — PLUS — (e) the fun that can be had from bringing the sounds of the everyday world into Room 102!

by Randolph S. English
Program Director
WTRY and WTRI-FM
Troy, New York

Herb Johnson, audio production man (left, in A.M. control room) gets set for "recording in 10 seconds" cue, while announcer Henry Clark stands by, ready to put another program on tape at WTRY.

"RECORDING IN TEN SECONDS". That's the cue that's used around our station Monday through Friday of every week. We at WTRY have recognized the terrific usefulness of tape recording and have spent four of the best years of our operation proving its worth—to us, to the sponsor, and to the audience. What's more, we've saved thousands of dollars doing it. Yet it's my personal belief that the surface of tape usage has hardly been scratched—particularly by the *local* broadcaster.

Before the innovation of tape usage on a professional broadcasting scale, the reproduction of sound was, for the most part, confined to the four walls of a radio or recording studio. To go out on location with portable disc equipment, or even with a portable broadcast amplifier and feed to a central recording headquarters via disc, was generally too costly—particularly when remote efforts were to be aired on a sustaining basis.

Tape recording has changed all this! Here at WTRY, we try to use tape recordings on a location basis as often as possible—to take the listener outside of the studio for a change; to go to the source, not just "talk" about it. This, of course, opens new vistas for the creative broadcaster. Tape also permits the "In studio" operation to be expanded, improved and simplified beyond your normal expectations. I know—we've experimented, and it's worked! BUT, it requires careful planning, a little elbow grease, a responsive technical staff, some extensive program ideas and, in general, an "operation tape". Once you've got the system going it's just routine, like most everything else in this hectic business. That's what I'm going to discuss—our system, how it's set up and how it operates. Perhaps you can use some of these methods to *your* station's advantage.

Approximately 25% of our total weekly output (commercial and sustaining) is now via magnetic tape. This includes db shows and original presentations. Remember, we're taping shows which were previously aired quite nicely as per schedule; they were expected and planned for. Here are five reasons why we now prefer to do it with tape:

1. "PERFECTION IN PRODUCTION". With taped shows we can guarantee the client 100% *perfection* in his 13, 26 or 52 week contract. (Many are the cases where Mr. Sponsor has cancelled or failed to renew his contract simply because of an announcer's fluff or an engineer's wow.) With tape, fluffs, wows and all mistakes can be edited by splice or erasure with ease. When a faux pas occurs, the tape is reversed to the error, a re-do is recorded and in a few minutes you're on your way again. Many dollars may have been saved, not to mention the prevention of embarrassment for all concerned! I'd say *that alone* is reason enough for converting "basic" programs to tape.

2. "EXCELLENT TECHNICAL QUALITY". By using tape, you're assured the best in quality in both speech and music. It's imperative, however, that your tape recording equipment be of professional structure in order to attain this life-like quality.

3. "FACILITY OF PERSONNEL". By taping programs you can actually cut down man hours, even with increased program service, by having the staffs of the various broadcasts "cut" during their normal work hours. This also gives you a chance to get a change of voice on the air, especially when you have a slim staff operation such as over weekends and on holidays. If you have a one-man voice operation for five or six hours at a stretch, the alternate breaks and spots can be cut in advance and run consecutively on a single tape. In other words, you can have a "full staff sound" seven days a week.

4. "PRODUCTION BROADCASTS". You can do the tough production shows you've always wanted to do, by taping during "off air" hours, or during network time. Or, to use the most ideal system, by cutting from a special recording set up, as we do at WTRY. In this way you don't hamper local operation. As many of you know, if you attempt to record during normal broadcasting hours with your "on the air" console, you are often confronted with a hectic one-channel bottleneck on the console, depriving you of a means of cue.

5. "SLOW THAT RAT RACE". In the average station operation, the audio production control man has several different shows to run every day; many of which require turntable spinning. Note how many shows a couple of air men and audio control men have during a particularly heavy section of your broadcast day. Listen to the beginning of that day, then to the end of the same period. If they're giving their all, someone is sure to get "pooped". Result—no one sells, not even themselves. If the audio man gets an occasional rest while a taped show is on, you'll be surprised how much better he will perform in the following programs.

So much for the principal reasons. I'm sure you can conjure up many others to suit your own station's operation.

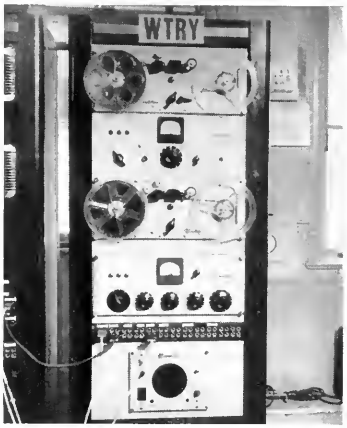
Now for the recording equipment. We have a special recording unit which includes a medium size up-to-date studio with 3 mike inputs. The studio is equipped with senior velocity mikes, announcers' tables and script stands, piano, synchronous Western Electric clock, sound effects material and the usual operating gismos basic to any broadcasting and recording studio. The control room is readied for mike work if needed. The G.E. board is adequate to originate any

and all *types* of programs. This console is flexible and interchangeable so as to receive all kinds of desired modulation including a half dozen remote lines with cues. The two recording control room turntables are Presto 16" rim driven console models with universal arms for lateral and vertical playback, four position disc filters, microgroove arms for LP playback, with facilities soon to be inserted for 45's. In a pinch the entire recording setup may be switched into immediate emergency "on the air" operation; however its importance to us is measured by it usefulness as a recording setup.

Shows done from this recording plant are piped down to the A.M. control room (the nerve center of our broadcasting) where our two Magnecord tape recorders stand ready to go to work at all times. Each of these recorders has gear ratios of 7½ and 15" per second. For the most part our shows are recorded at 7½", giving each of our full tape reels a 30 minute playing time. Adjacent to the tape recorders are two Presto 15" 78 and 33-1/3 rpm disc cutters. In addition, we keep a third Magnecord unit in the control room for test cuts, rehearsal playbacks and general emergency traffic.

In the A.M. control room we post a recording schedule which lists the time each program is slated for cutting. (Every program is recorded at the same time, daily or weekly.) This schedule also lists the origin of the recording (recording studio, A.M. studio or other), announcer scheduled to do show, and playback day and time. The full recording schedule is laid out on a Monday through Friday basis. Adjacent to this schedule is a tape assignment sheet on which is listed every broadcast that is taped. Each of these shows has a number assigned to it (we have numbers 1 through 30). Each show keeps that one particular tape until the tape is deleted from usage, at which time a new tape is inserted, retaining the same number in order to prevent confusion. Next to this list are the tapes themselves, kept in a vertical rack with metal partitions. Right beside the rack are tape cards (3 x 5) to be made out after each show and inserted in the box with the tape. On these tape cards is the information that the playback engineer needs to know before "threading the show"; name of broadcast, tape number, on what recorder show was cut (sometimes playback on a different machine results in time lag or time increase), day, date and air time of playback, program time, whether or not there is continuity to be read live, and whether a cue sheet will accompany playback—finally, the playback engineer's comments, if any. These tape cards actually make a second check over the information found on the recording schedule. But to prevent any possibility of error, a "tape cue" is given verbally on *all* taped broadcasts. This verbal cue is given ten seconds before the start of recording. For example: "Recording the 'Rex Stewart' show for playback Saturday, February 16 at 7 P.M. on Tape No. 17 using recorder No. 1. Recording in 10 seconds." Incidentally, where two scheduled playbacks come back to back, each show is assigned an *alternate* recorder on the tape assignment list.

What kind of shows do we tape regularly at WTRY? All kinds—one time shots, daily strips, across the board deals, once weekly shows and location broadcasts. Whenever we have permanent or semi-permanent cuts to make on disc, the material is taped *first*— then dubbed onto disc. The quality is particularly good. These are the different methods of recording at our station, with tape used as the backbone of our recording efforts: directly on tape— tape to tape — tape to disc — directly on disc. Then we can do the following five recording and broadcasting jobs simultaneously: tape the network– tape from recording studio— tape from remote pickup — record on disc from A.M. studios—and send out air program locally, using turntables if needed.



Two rack-mounted Magnecord tape machines in WTRY's A.M. Control Room. Plug-in strip at bottom is used for patching these units into board in recording control room and all other combinations, including recording studio on floor above.

So you see, when we here at WTRY say "Recording in 10 seconds", we're really wrapping it up—IN TAPE.

by Sidney B. Simon
Senior High School
Bradford, Pennsylvania

(Another second award winner in Audio Devices' Educational Recording Contest)

My tape recorder probably got its most convincing workout, recently, when we were studying a unit on propaganda. It was a pupil-interest project that was really very simple and yet that made a point that hit home with an impact that would have been hard to equal in any other way.

Here is how it worked. I told a story and cut it on the tape recorder. I found that an account of an automobile accident served to motivate itself and also brought to the class another blow for safety's sake. I made use of a room off of our library, although any large closet or storage room off of another room would serve as well, and called in the students one at a time. The first student listened to my account of the accident on the playback, and then he recorded his own version of the story. The second pupil listened to the first pupil's version and then recorded *his* account of the story. And so we worked our way through the class — each person listening to the playback of the story version of the student before him, and then recording his own telling of the same story.

The next day all the tapes were listened to in sequence. Immediately there was a roar of laughter as they saw how their own version had differed from my original, and then with paper and pencil, we kept notes of the changes that were made in each successive story, and we spotted the trends and patterns which revealed the most consistent inaccuracies.

It is amazing how convincing the experiment can be, because the tape never lies. As an outcome following this little experiment, it was almost humorous to observe the accuracy they demand of each other now, and fewer stories—gossip, propaganda, or rumor — ever get blown up out of proportion. What better weapon against propaganda and rumor mongering than recorded truth!

NEW LANGUAGE LAB at University of Florida

70 Station Tape Setup Teaches Five Languages at the Same Time

A pretty blue-eyed blonde adjusts her headset and starts listening to a Spanish short story while her neighbor answers questions being put to her in French. Somewhere in the back of the room a concentrating college youth jots down the answers for a test being dictated to him in German.

Scenes such as these are every-day events at the University of Florida, Gainsville, Fla., where "learning languages by listening" is the newest keynote for students of a foreign tongue.

The U. of F's Department of Foreign Languages has just been equipped with a brand-new laboratory in which five tape recorders spin away in various tongues for the benefit of listening students who may be tuned in at any of the 70 outlets located in individual booths throughout the room.

To the visitor it all may sound like tangled talk, but the students plugged in to one of the recorders have discovered that teaching by tapes in this manner is not only informative but lots of fun. Right now the lab is offering work in French, Spanish, German, Russian and Portuguese and is prepared to teach Italian, Greek and Latin.

The pretty blue-eyed blonde and her neighbors will spend 50 minutes three times a week on laboratory learning of a language and also will attend two hours of lectures weekly.

Although practical use of the language comes in lab-time, the student finds that time spent in the classroom is invaluable since the structure of the language is explained, literary texts are read and assimilated and the whole subject of language study is developed in a simple and understandable manner as the basic means of human communication.

As Dr. Joseph Brunet, head of the Foreign Language Department, explains, "The course remains, therefore, a liberal arts course of educational value above and beyond learning how to speak a foreign language."

The University "learning by listening" laboratory is among the first in the nation to use such machines, being similar to one which has been achieving exceptional success at Georgetown University. The equipment was installed here last year and used for experimental purposes on a small scale in 1950-51. With the start of the current fall semester, the lab was placed in operation as part of the general foreign language program.

Brunet points out that after his staff has trained a group of first-year students, the program will be organized on a project basis, the year's work consisting of groups of recordings, each developed around a central theme and aimed at giving students fluency in conversing on that theme.

The main purpose of the current program is to train students so that they are not only able to read a modern foreign language, but will be able, with fluency and considerable correctness, to carry on a conversation in the language at least by the end of the fourth semester.

In pointing to results, Brunet said, "The improvement in the method as compared with earlier ones lies in the fact that for the first time students have supervised and planned practice in use of the language to a degree that otherwise would be impossible."

He added that students in the lab are now pronouncing better, expressing themselves more freely in the language and showing far better comprehension of language structure than in the past. Also—an important factor — both students and faculty members are enthusiastic about the way the program is working out.

The lab with its rows of listening posts and recording devices is by no means complete at present and it is planned to put in operation a shortwave radio so that foreign language broadcasts of interest to students may be tape recorded for use in second-year work.

"The program is in a state of continuing development", the Foreign Language head explained. "What we are doing now is certainly not in all respects what we will be doing next year or after. Techniques and methods are under constant examination and review and the purpose is to develop recordings that will be ideally suited to the plan of a course."

The present laboratory setup includes 70 booths mounted on tables and connected by five separate channels to a bank of five BK-411 Soundmirror tape recorders located at the front of the room. Each listening booth is provided with a row of five telephone jacks, one for each recorder channel. The student simply plugs in his headset on the channel which is playing the recording of his particular class and lesson. The lessons to be played on each channel are an-

Above. These students busy in booths are studying tape recorded language lessons in the University of Florida's new Language Laboratory. Members of this group are working in Spanish, French, German, Portuguese and Russian.

Right. U of F coed Emily Chorpening of Miami concentrates on her Spanish lesson in the University's new foreign language listening lab, while her neighbor, Carole Linder, Miami, also learns Espanol via tape recordings.

Dr. Joseph Burnet, head of the Department of Foreign Languages at the University of Florida, checks one of the five tape recording machines in operation in the University's brand-new Foreign Language Listening Laboratory which launched full-scale operations this semester.

nounced on a blackboard near the machines. Five groups of about 14 students each are accommodated every hour. The laboratory is operating 41 hours per week on this basis.

The recording speed is 7½ inches per second and, with 7-inch reels of paper base tape, the average playback time is about 45 minutes. Power is 105-120 volts, 60 cycles, single-phase. Consumption is 85 watts. Output impedance, both internal and external, is 3.2 ohms. Power output is 1 watt undistorted.

In the meantime, however, University language-learners are taking to tapes in a big way. And whether they are using those headsets for tests, short stories, or just plain conversation in a foreign tongue, they're virtually all agreed that learning by listening is a great innovation.

"The Language Laboratory"

This new booklet — reprinted from the Report on Second Annual Round Table Meeting on Linguistic and Language Teaching held at Georgetown University — covers the current thinking of leading educators in this field.

Copies can be obtained without cost by writing to Educational Laboratories, Inc., 1625 Connecticut Ave. N.W., Washington 9, D. C.

TAPE BREAKS "PAPER BOTTLENECK" IN FILM PRODUCTION

Venti-Davis, Inc., producers of films and other visual training aids, use tape recordings to speed up approval of scripts

Preparing the "text" for a sound film or motion picture is a pretty big job in itself. But when the script has to be approved by a whole committee—as is often the case—the approval job can be a major stumbling block for all concerned.

Venti-Davis, Inc., of 152 East 40th Street, New York City, has solved this problem very simply and effectively, by means of the tape recorder.

Previously, in a situation like this, a typed copy of the script was given to each of the many individuals who had to O.K. it. Then each would take a firm grip on his "blue pencil" and go to work. And when all the suggested changes were combined, the result was often a far cry from the original carefully-prepared script. This method of approval took a lot of time — conflicting opinions had to be resolved — details of phraseology laboriously worked out to everyone's satisfaction.

Now, however, the completed script is tape recorded, with one or more professional narrators, and played back to a group meeting of the client's organization. They get the story in the manner in which it is intended to be presented—by ear, not by a lifeless typed script. Often the *way* in which something is said is just as important as *what* is said. This gets across perfectly with tape, but is entirely lost when read from a typed page.

Robert F. Davis, president of Venti-Davis, Inc., mans the controls of his Magnecorder while the "cast" gets ready to put another training-film script on Audiotape. Robert Bruce, advertising and promotion manager (standing), lends moral support.

Mr. Robert F. Davis, President of Venti-Davis, Inc., reports that since this method was put into practice, the group approval job has become very painless to all concerned. It has been used on about 20 scripts in the past four months, and has saved countless hours of re-write work. In most cases, playbacks have been given immediate approval with but a few minor changes.

A portable Magnecorder is generally used for this purpose. This machine, recording on plastic-base Audiotape, fulfills the sound quality requirements of the most critical listener — gives a reproduction in every way equal to the finished product. The approved recordings of every script are kept in the reference files for about a year.

Recorded sound plays an important role in many other ways at Venti-Davis, Inc., too. For sound motion pictures, sound slide films, and sales and personnel training records are the tools of their trade. One interesting Venti Davis job currently in production, is the preparation of a series of personnel training records for the J. C. Penny Company. Typical interviews, demonstrating the best way to cope with employee problems, are first recorded on tape then transferred to discs, for reproduction in the form of 78 rpm phonograph records. Pressings of each record are distributed to the 1600 branch managers of the Company. These recorded interviews are far more effective than a printed script of the same situation, because the proper "tone of voice" is extremely important in problems that deal with human emotions.

Mr. Robert Bruce, Advertising and Promotion Manager for Venti-Davis, Inc., states that the tape recorder offers unlimited possibilities for rendering more effective service to their clients.

They bring true listening enjoyment to millions—through the finest in modern sound recording methods and equipment

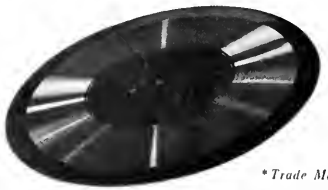
RCA Victor's modern Vinylite phonograph records are infinitely superior to the old shellac pressings of a few years ago. Better in tone quality, distortion, surface noise and frequency range. This improvement in quality requires more precision than ever before in every step of record manufacture and processing. That's particularly true of the original sound recording and the master discs from which the stampers are made. And RCA Victor has found that Audiotape and Audiodiscs are an ideal combination to meet the exacting demands for today's high fidelity phonograph records — Audiotape for clearest recording of the original sound and Audiodiscs for fast, easy processing without loss of sound quality. In fact this record-making combination is now being used with outstanding success by America's *leading producers* of fine phonograph records and broadcast transcriptions.

Whatever *your* recording work may be, Audiotape and Audiodiscs offer you this same sound perfection — the result of more than 12 years of specialized experience by the only company in America devoted solely to the manufacture of fine sound recording media, both discs and tape.

. . . including

for the original sound

. . . and
for the master recording



**Trade Mark*

444 MADISON AVE., NEW YORK 22, N. Y.
Export Dept.: 13 East 40th St., New York 16, N. Y., Cables "ARLAB"

April-May, 1952. Vol. 8, No. 4

Published by
AUDIO DEVICES, INC.
444 MADISON AVENUE, N. Y. 22, N. Y.

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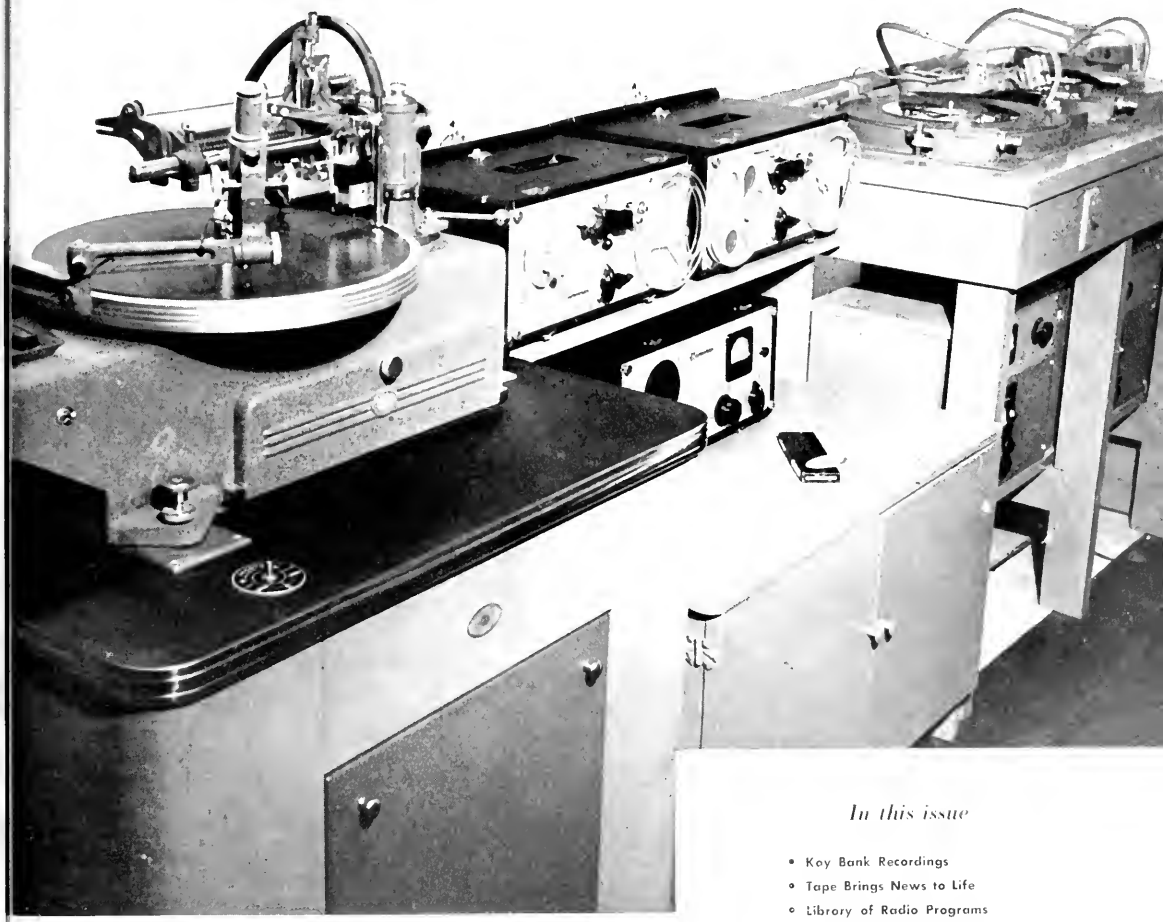
audiofilm
audiopoints



Part of the compact tape and disc recording room of Kay Bank Recordings, Minneapolis, Minn. In foreground is the Presto 8DG disc lathe with MacIntosh amplifier and Fairchild hot stylus cutting head used for cutting Audiodisc masters. Story on Page 2.

In this issue

The Story of KAY BANK RECORDINGS

How an ex-newspaper man made sound recording grow from a part-time job to a full scale studio operation

Part of the control room at Kay Bank Recordings, showing RCA 76B2 console with talk-back mike to studio, Ampex recorder for studio tape work, and transcription turntable.

Main recording studio at Kay Bank Recordings, showing drape arrangement for dividing the 32 by 35 foot space into two smaller studios. Modified sound truck at left, TV lamps in background.

Visitors to the well equipped and completely modern sound studios of Kay Bank Recordings in Minneapolis might be surprised to know that this flourishing business started but a few years ago — as a spare time job with a home wire recorder. At that time Vernon C. Bank was a newspaper man at the Minneapolis Star. In order to pick up a little extra income, he and his wife Kay decided to get a Webster wire recorder and do a few weddings. This worked out pretty well and as soon as the news got around, they received numerous requests for recordings from local choir and chorus directors.

Within six weeks Vern and Kay Bank were in business with Presto turntables and amplifiers, turning out acetate copies at a pretty fast clip. This was still a spare time job, carried on at home after hours. As the business grew, the Banks moved to a larger residence, where the living room was set up as a sound studio — opening the way for studio work in addition to on-location recordings in schools, churches, etc. By fall of last year the recording load had grown to the point where it could no longer be handled on a part-time basis, along with the regular job. So Minneapolis lost a good newspaper man -- and gained a skilled sound recordist. After leaving the Minneapolis Star, Mr Bank lined up some investors, incorporated, and opened the present spacious studios at 111 North 11th St. Since the recording idea was originally conceived by Mrs. Bank — who still takes an active role in the business — the new organization was appropriately named "Kay Bank Recordings". It is a name that is already widely known in recording circles throughout the North Central States.

In speaking of his present facilities, Vernon Bank modestly states that "we have enough basic good equipment to do a good job — and we are progressing to the point where we will give this area the kind of a studio it should have." The main Kay Bank studio is 32 by 35 feet, with 12½ foot ceiling — so designed that it can be divided in half simply by closing a set of drapes. The "half size" studios are used for recordings by individuals, soloists and small groups — and the full studio, for television productions, choirs and choruses, bands, and certain types of dramatic presentations. Additional space includes a combined recording and control room, audition room, reception room, lounge and mail room, tape and disc storage room, and spare room for maintenance work and storage of extra equipment.

Complete control facilities are provided by an RCA 76B2 console, through which studio programs are fed to Ampex or Magnecord tape recorders, or direct to a Presto 8DG disc lathe equipped with a Fairchild head and MacIntosh amplifier. For master discs, a Fairchild Thermo-Stylus cutter is used. The console type Ampex tape recorder is primarily for studio work, with portable Magnecord machines for remotes.

Choirs and choruses, which constituted practically all of the early recording work, are still an important part of the Kay Bank operation. Their recordists range all over

audio record
VOL. 8, NO. 4 APRIL-MAY, 1952

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

the area — from Iowa to North and South Dakota, Minnesota and Wisconsin — doing vocal and instrumental groups for churches, colleges, schools of all types, hospital choruses, industrial choruses and many others. Now, with the enlarged facilities, more and more time can be spent on commercial accounts. Many advertising agencies in Minneapolis and St. Paul are already bringing their work to Kay Bank Recordings, where they are offered a really complete service, including tape and disc recordings, transcriptions, phonograph records, jingle writers, producers, singing and acting talent, musical talent, arrangers — in short, everything needed to wrap up a program.

One Kay Bank project of particular interest is the current series of twenty-six 15-minute transcriptions for Sister Kenney — featuring such well-known talent as Duke Ellington, Rudy Vallee, Stan Kenton, Russell Nype, Les Brown and Xavier Cugat. Some of these artists recorded directly in the Kay Bank studios — others were dubbed in from tape recordings made elsewhere. This series, along with some short spots, will be offered to every radio station in the country.

Here's a business that started, not on a shoe string, but on a spool of wire. Vernon and Kay Bank have made a lot of progress since then — in a field that still offers plenty of room for future growth.

Vernon and Kay Bank review a Sister Kenney script with stage and TV star, Russell Nype (right).

Rudy Vallee limbers up his vocal cords, while Vernon Bank (left) and chief engineer Norman Nelson (right) check the program material to be recorded for one of the Sister Kenney Foundation transcriptions.

Tape Brings News to Life

by Jim F. Palmer

Professor of Journalism, University of Houston

A news editor briefs the student announcer on narration parts of the tape-recorded "Newsreel" program.

Songstress Sophie Tucker recalls her early life on tape for the University of Houston "Newsreel" show, produced and edited by students. The young reporter is awed, but not enough to interfer with asking questions.

A new student crew is briefed on the tape editing of news by two members of the Radio Department faculty of the University of Houston.

Living news, as it actually happens, is recreated through tape recording in a new series of "Newsreel" radio programs produced by radio-news students at the University of Houston, in Houston, Texas.

Every day three news students tour the campus and the city with portable tape recorders, picking up the news as it happens, interviewing for the "feature" angle.

The students assemble every evening, and edit out the unwanted material, leaving anywhere from 10 seconds to a minute for each news event. They take notes as they go. Then, comes Thursday, and the news bits are assembled into the right order and timed to about 11 minutes, about right for a 15 minute program.

Narration for announcer is prepared by the student editor, who also selects suitable "bridge" music from the recording library. Friday morning, and the script is being written, complete with announcer narration, bridge music cues, tape cues (with exact time of each tape bit, in order to help the control engineer in cueing), and any incidental instructions. Then, the whole program is rough-timed, by estimating time of each bit of voice and music. It should add up to 14:30 minutes for a 15-minute show.

The whole program, then, is presented from a studio and control room. The editor serves as director, in the control room, cueing the engineer and announcer. As the job is somewhat complex, most of the student editors prefer to run the show through in its entirety, tape recording it throughout on a second studio recorder, for playback at the set time.

Thus, each Friday, the University of Houston "Radio Newsreel" hits the air over its own radio station, KUHF FM. From its first dramatic musical fanfare, through its important voice of the mayor announcing an ordinance, the learned tones of a history professor, to the giggle of coeds talking about leap year — and to the closing music surge, the program is made possible due to the magic of high quality tape recording.

by Harold Hainfeld, Roosevelt School, Union City, New Jersey

(A first award winner in Audio Devices' educational recording contest)

What are the reasons your teachers give for not using radio more in the classroom? Some of them may be: (1) The radio program does not come on the air at the time of day when I can use it; (2) Programs are not at the proper time of the year to fit our curriculum; (3) I can not prehear a radio program and would like to know what my students will listen to; and (4) If I assign after school listening, it may not be heard by all students.

Once a radio program goes "off the air", it is usually difficult to borrow a transcription and almost impossible to keep it for use in the classroom. There are many radio programs worth saving for future school use.

One of the solutions to these problems is for the classroom teacher, radio chairman or audio-visual coordinator to save valuable radio programs on tape. In a short time the school or school system can have a library of important curriculum materials. If a radio program has enough merit for use in the classroom, serious consideration should be given to making a tape recording of it for future use when the program is unavailable on radio. It can easily be erased if the program is of limited value.

Being located in northeastern New Jersey, two FM educational stations are within our range; WBGO-FM, Newark and WNYE-FM, the New York City station. Both transmit a full schedule of programs during the school day. These programs, however, are designed to meet the curriculum needs of their schools. Many of the topics are also studied in other classes, but not at the same time. Making tape recordings of these programs makes them available at any time of the day or year.

In making school-made tape recordings of radio programs it is important to have good equipment. This is not necessarily expensive. The Freed-Eisman "Educator" radio used in many schools has ample frequency response. Don't impare the quality of the reproduction of the radio program by using a recorder with less. One with a higher frequency response is unnecessary for this purpose. There are many tape recorders that have this response, priced about $200.00. The radio has an outlet to permit direct recording from it into the tape recorder and any outside noise will not be reproduced on the tape.

This class at the Roosevelt School is "all ears" as the portable tap recorder plays back an educational radio program. Programs recorded on tape can be kept indefinitely — used whenever needed at any time of the day or term.

Principal of Roosevelt School, Charles E. Brown and Miss Anne Naddeo, teacher, listen to a radio program from WNYE-FM being recorded on tape by 8B student Rhoda Lampidis of the school Audio-Visual Squad.

Schools with a radio and tape recorder can build up a library of useful radio programs. Federal Communications Commission regulations permit the use of tape for this purpose, provided the recording is not sold as a commercial project.

The storage of tape reels is no problem. They are small and compact. The tape reel is approximately the same size as a reel of 8 mm. film. Many photographic dealers have cans and containers for the home movie maker. Schools can use this 8 mm. equipment for permanent storage of their tapes.

Don't overlook the possibilities of making tape recordings from commercial radio programs. Most of these stations, in addition to transmitting on AM wavelengths, are also broadcasting on static free FM. Record from the FM band; it has a higher frequency response and almost no interference. With the program on tape, it is easy to edit it and eliminate the advertisements and announcements. Thus, a 30 minute broadcast can be made into a 23 minute tape recording, leaving plenty of time in the usual 45 minute period for the teacher to introduce the program to his class and time for follow-up activities afterward. The recorders are light and portable and easy to bring home from school to make after-school recordings for in-school listening.

There is another possibility for the radio-tape recording combination. WNYE-FM presents a science quiz, where students from two junior or senior high school classes try to answer questions on their science studies. Having the program on tape enables the teacher to let his students hear the question and stop the recorder before the answer is given. Thus, the students in class can answer and discuss the question before the answer is given. This procedure would be impossible with the radio.

Schools, school systems and county educational departments are building film and visual aids libraries. Audio-Visual and Curriculum personnel should not overlook the possibilities of inexpensive audio libraries of valuable radio programs on tape.

Radio and recording equipment are usually less expensive in comparison to projectable equipment. The combination of radio and tape recorder will allow the teacher to pre-hear programs. Previewing films before use is an important part of proper utilization. With the program on tape, it is possible for the teacher to know in advance what his students will hear. Building an audio library of radio programs that meets curriculum needs is an important step in using these aids in teaching.

The Henry G. Dietz Company, 12-16 Astoria Blvd., Long Island City 2, New York, is now offering a new line of console type tape-disc recorders, designed for industrial, business, home and school applications. Three different applications are available — Model 130-A, as illustrated, with tape-disc recorder, FM receiver and console cabinet; Model 130-B, without FM receiver; and Model 130-C, with table-top cabinet.

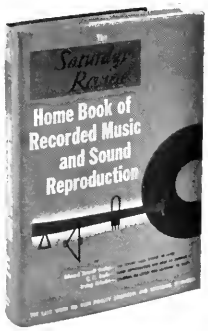
The Model 130-A unit is designed to perform the following recording and reproducing functions:

Record on magnetic tape or acetate discs
Reproduce from tape or discs
Record from tape to disc or vice versa
Record from microphone, internal FM radio, external radio or phono to tape or disc. Can mix microphone with recorded disc to record on tape.

Equipment includes automatic PM erase, neon recording level indicator, fast forward and rewind speeds and 6" PM speaker. Tape speed is 3¾" per second, dual track, giving one hour recording time on 5" reel. Disc recorder cuts and plays back up to 10" discs at 78 rpm. When pivot of arm is lifted, it snaps into recording position. Arm

is pushed down to disengage lead screw for playback. Cutting stylus and playback needle easily interchanged.

The console type cabinet allows the unit to be built to customer's specifications, including FM or AM receiver, amplifiers, or other equipment necessary for a particular application. Further information can be obtained by writing to the manufacturer



The *Saturday Review* Home Book of Recorded Music and Sound Reproduction

. . . by Edward T. Canby, Cornelius G. Burke and Irving Kolodin

This 312-page book for home recordists and music lovers is divided into three separate sections — each by a recognized authority in his field — giving an unusually complete three-dimensional picture of this fascinating subject.

In "The Record from Studio to Store," Edward Tatnall Canby offers a brief history of the recording industry, then describes how new high fidelity equipment records all of the nuances of the music as it is performed. Recent advances in recording techniques are explained in the simplest terms. A recording session is described, and the reader is taken into a factory to watch the manufacture of the various discs now available.

Cornelius G. Burke's "Home Reproduction and How to Improve It" answers all the music-lover's questions about what home equipment is best and how much it costs. Concentrating on essentials, he shows how to connect and set up speaker arrangements, amplifiers, pick-ups, needles, turntables, and other equipment. A series of "how-to" sketches emphasize the practical nature of this book.

In "Learning to Listen and Listening to Learn," Irving Kolodin, America's foremost music critic, tells how to sharpen your critical faculties and become your own critic. Using a remarkable and entirely original approach, Mr. Kolodin explains how any record collector can judge for himself the best of the half-dozen or more recordings of his favorite piece.

Published by Prentice Hall, New York. Price, $4.50.

by Vincent Lee

Recently I completed my term assignment for my Advertising course at New York University.

Since Advertising is, in my opinion, a subject of originality, I decided to do a project which was unique. As a basis for my report I chose the Marketing Research phase of Advertising and the result was an "A".

The project consisted of interviewing various people on questions pertaining to the brand of shaving cream they used. The uniqueness of the report was that I presented it via tape recording machine and color slides. I recorded the actual interviews among ten men and took color pictures of each. In the classroom I projected the slides and using the tape recording played back the dialogue as it had occurred. The results were nothing short of sensational. The class was impressed and even more important "interested" in my project. Professor Dale Houghton, my prof, liked it to the extent that I presented it in two of his other classes.

To achieve more sufficient data for the survey I interviewed one hundred students at N.Y.U. The same questions were asked.

Vincent Lee (left) puts another student interview on tape for his Market Research report.

After I computed the percentages I recorded this information and thus presented the whole report on tape without saying a word in class.

Some of the Statistics estimated are as follows:

27% use electric razors and 73% use safety razors

Of the 73% — 55% use brushless cream and 45% use lather.

By percentage the four most popular brands are 1) Palmolive 19%, 2) Colgate 13%, 3) Rise 12%, 4) Noxema 10%

THE AUDIO QUESTION BOX

Here are a few of the many questions which we have received from sound record-ists, in response to the "ANY QUES-TIONS?" item in the February issue of Audio Record. We believe that the ques-tions and answers listed below will be of interest to many of our readers.

QUESTION: Will you please advise how I can determine if the head on my Magne-cord tape recorder is magnetized.

Answer: If the noise level of the recorded tape has gone up significantly and if the reproducing preamplifier is not defective (particularly the input tube) then it is quite probable that the head is magnetized. For best results, a machine which is used 8 hours a day should have the heads demagnetized once or twice a day.

QUESTION: We make on-the-spot tape recordings of weddings and other events — then re-record on Audiodiscs. Will Yellow Label Audiodiscs give a satisfactory cut in comparison to the Red Label?

Answer: Yes. This type of service probably does not require the flawless perfection of surface which characterizes the Red Label Audiodisc. Any microscopic surface imper-fections in the Yellow Label Audiodisc would not be noticeable in recordings of this nature — and the saving in cost is prob-ably an important factor both to you and your clients.

QUESTION: For the application men-tioned above, is it better to buy a *used* pro-fessional tape recorder (which would cost about $600 to $800 new), or a *new* low priced home recorder in the $200 class?

Answer: If the recorder is to see a great deal of use and you want an ample margin of safety in frequency response, signal-to-noise ratio and distortion, a used profes-sional machine would probably be the best investment. If you don't know anyone who has such a machine for sale, it might pay you to run a want ad in one of the trade publications.

QUESTION: With my Bell tape recorder, how can I find the exact point at which to cut the tape in order to eliminate unwanted material? What methods do the profes-sionals use to do such a perfect job of editing?

Answer: The professional depends largely on a trained ear — plus lots of experience. Also, most professionals use a 15" second tape speed, which gives a wider tape spacing between words and makes it easier to do an accurate editing job. Obviously, the slower the tape speed, the more difficult it is to avoid cutting at the wrong place. Our ad-vice would be to keep trying. It's just a matter of skill which can be developed with practice.

QUESTION: I am interested in purchas-ing a tape recorder, but haven't been able to get much comparative information. Would you please list the output responses of four or five tape recorders that retail below $250. Also, how does the response of these recorders compare with that of the average home radio-phonograph combina-tion?

Answer: Probably the best compilation of comparative performance data and prices on tape recorders available today is the "QUICK FACTS ON MAGNETIC TAPE RECORDERS", published in the August-September 1951 issue of Audio Record. This lists 69 different models of 28 different manufacturers, and includes all of the basic information needed for selec-tion of the recorder best suited for any particular application and budget. Reprints of this section are still available and will be sent on request without cost or obliga-tion.

As to the second question, the frequency response range of tape machines selling for under $250 is well below that obtainable from a good commercial phonograph record.

QUESTION: Without laboratory equip-ment, how would a home recordist be able to check frequency response of his equip-ment? Is there any relatively simple way of at least getting some idea of the range of frequencies his recorder is capable of repro-ducing?

Answer: Without laboratory equipment, a trained ear is the only measure of frequency response — and this is often surprisingly accurate. For a rough approximation, we suggest recording and playing back some simple piano scales, and noting the point at which tone quality begins to suffer. In this connection, the following frequency figures may prove helpful. Middle C on the piano represents a frequency of 256 cycles, and the frequency is *doubled* for each octave higher — *halved* for each octave lower. C^1 (first octave above middle C) is there-fore 512 cycles; C^2 (second octave) is 1024 cycles; C^3, 2048 cycles; C^4, 4096 cycles. These, of course, are the *fundamental* fre-quencies which, with their harmonics or overtones produce the sound quality or *timbre* which characterizes a particular musical instrument. The fundamental alone is not at all pleasing to the ear. For suitable musical reproduction, therefore, a recorder must have an upper frequency limit at least three or four times the fundamental fre-quency of the highest musical note which it must reproduce. The upper sensitivity limit of the normal human ear is about 20,000 cycles.

QUESTION: On my tape recorder I find that in rewinding I can hear a faint signal (going backwards) of what is on the tape and yet with this model the tape is moving at least an inch *away* from the play-back part of the head. What would be causing this and could it be a sign that the recorder is breaking down or is faulty in some way and in need of expert attention?

Answer: This is a perfectly normal phe-nomenon, due to the extreme sensitivity of the head, which picks up the magnetic pat-tern on the tape even at a distance of about an inch away. If it is annoying, all you have to do is turn down the output volume dur-ing rewind.

PROFESSIONAL COACHING VIA TAPE

by Daniel Seidman
2 Peter Cooper Road, N. Y. C.

(Second award winner in Audio Devices' educational recording contest)

I am a Junior High School teacher and almost all teachers of grades three through nine must present plays. Since I am a health education teacher, my ability as a dramatic director is sorely limited. I discovered an easy way out of my predicament which proved to be most successful.

I recorded a play directly onto my tape. I took it off a long playing record but it isn't necessary to tell you that I could have taken it from almost any source . . . radio, television, etc. I then cut the tape after every two minutes of playing time, espe-cially where the natural break came in the dramatic presentation. I then spliced onto the tape blank, unrecorded tape . . . about 5 minutes of playing time. In other words, I had two minutes of the original play fol-lowed by five minutes of blank tape, two minutes of play continued from where it was cut, five minutes of blank tape and so on.

The final step was to record the children on the blank tape after they listened to the characters present their parts on the two minutes of the recorded tape.

The children heard and reheard their parts presented by the professional actors and then listened to their own voices in imitation of the experts. Of course, all their errors were easily noted.

Incidentally, I used leader tape after each splice upon which I wrote all pertinent in-formation . . . the names of the characters, children, etc.

audio pointers for the Recordist

by C. J. LeBel, Vice President
Audio Devices, Inc.

HOW TO HELP YOUR PROCESSOR

C. J. LeBel

We are afraid that the subject of this article is in the man-bites-dog class; studios have often complained about their processing laboratories, but here's a case where the laboratories have a few justifiable complaints of their own. After talks with several large processing organizations, it becomes evident that hurry, carelessness, and new studio personnel unused to the stringent requirements of master recording are injuring record quality and sometimes even making processing impossible.

Faults may be separated into these three classes:

A. Prevent a disc from being processed.
B. Produce noisy pressings.
C. Make unnecessary trouble for the processor.

Faults Which Make Processing Impossible

Incorrect diameter of the disc is inexcusable — it is necessary to use a master size larger than the disc to be pressed: 12-inch for a 10-inch pressing, 13¼-inch for a 12-inch pressing, and 17¼-inch for a 16-inch pressing. A 16-inch lacquer cannot be processed to produce 16-inch pressings, and that's that.

Incorrect dimensions of the recorded area may make it impossible to produce a saleable record, even tho pressings can be made—for example if the modulation starts at too large a diameter, the outer grooves cannot be played on an automatic changer. Omitting the coarse pitch lead-in groove will also make automatic playing impossible. Both RTMA and NARTB have dimensional standards, so use them as your guide.

Wrong groove dimensions can also create trouble. Processors may have trouble pressing a 16-inch disc if it was recorded with a small-radius microgroove stylus. If the groove/land width ratio is too small, a disc is unplayable even though pressings may be made. Use a 60/40 ratio for transcriptions, and a 70/30 ratio for microgroove discs.

Misguided economy can lead to trouble, too. Lacquer masters cost more than regular discs, for they are especially selected for perfection of surface. The difference in sound may be imperceptible, but occasionally a groove will go through a minute surface imperfection, producing a groove irregularity which makes it impossible to press. Masters are picked to avoid such faults.

Occasionally a stylus gets a notch in the edge as the result of wear. Such a stylus should not be used for masters, for the metal master will have a ridge which makes it impossible to produce good pressings. As shown in figure No. 1, the pressing stock catches on the ridge, and the pressing cannot be stripped from the metal part without ruining the groove wall.

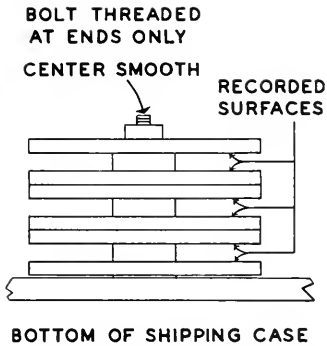


Figure 1. Enlarged cross sectional diagram showing why a disc cut by a notched stylus often cannot be pressed without ruining the groove wall of the pressing.

A serious problem results if lacquer masters are forced on an oversize metal spindle. The resulting buckle makes the disc useless. This seems to happen most often during packing.

Causes of Noisy Pressings

Strange as it may seem, the worst source of noise is very simple; use of a worn recording stylus. The pressing can be no quieter than the original lacquer.

Another source is equally simple; too low recording level. The signal to noise ratio of commercial pressings of the highest quality will seldom average far better than 50 db, so a recording level whic his 10 db too low will produce a signal to noise ratio of 40 db — commercially disastrous. Some have reduced their recording level because of high frequency overload when using the 16 db of preemphasis of the NARTB recording characteristic; this problem is overcome by changing to the AES characteristic and using only 10 to 12 db of preemphasis.

Carelessness can add swishes, clicks, and pops. Finger marks are the most common cause of swishes. Once a finger mark has been made, it is virtually impossible to remove. Handle a disc by the *edges* only. Clicks and pops result from dirt. Ask your processor to suggest a design for a shipping case. Most important, do not ship masters with the recorded surfaces in contact, for this will imbed any dirt on the surface. Ship masters back to back, with spacing washers between the pairs, and with the outer discs facing inward, as in figure No. 2. Do not ship in envelopes.

Helping the Processor

Unless you like to play games (at your own expense), be sure to put an identification number on each disc, for otherwise the processor has to guess which disc is which. The marks should be placed at the very center, or outside the recorded area. Make numbering an integral part of recording room routine — for a single slipup may be costly.

Information on the faults most frequently encountered in masters submitted for processing was contributed by Columbia Records, RCA Victor Recording Division, and K. R. Smith Division of Allied Record Manufacturing Company. Additional specific information on the proper preparation of masters for processing is available in the free publication, "Suggestions for Professional Master Recording", published by Allied. Copies can be obtained by writing to the K. R. Smith Division of Allied Record Manufacturing Company, 619 West 54th St., New York, N. Y. — or Allied Record Manufacturing Company, 1041 North Las Palmas Ave., Hollywood 38, California.

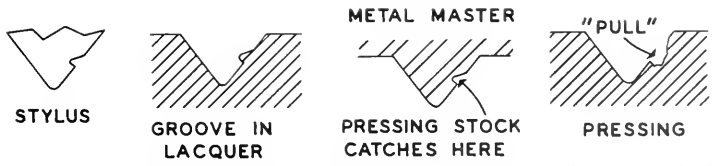


Figure 2. Proper method of packing lacquer masters for shipment to processor. Note that recorded surface is always protected from contact with other surfaces. Case should be dust-tight.

Behind the familiar blue label of WOR recording studios...

the finest in modern sound recording methods and equipment

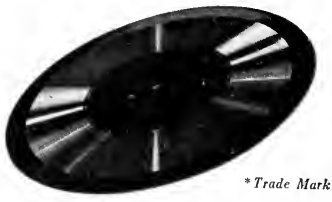
Radio stations from coast to coast recognize this label as the mark of a top quality transcription. One that can be depended on to meet or exceed the extremely high broadcast standards of sound quality.

To maintain this reputation, WOR Recording Studios, one of the largest in the world, use the finest and most costly tape and disc recording equipment obtainable. And—what's equally important—their engineers have found that Audiotape and Audiodiscs are an ideal combination for meeting the exacting requirements of broadcast transcription and commercial recording work. This same record-making combination is also being used with outstanding success by America's leading producers of fine phonograph records.

With Audiotape and Audiodiscs, you can achieve this same sound perfection in *your* recording work, too. Their consistent, uniform quality is the result of more than 12 years of specialized experience by the only company in America devoted solely to the manufacture of fine recording media, both tape and discs.

...including

and



* *Trade Mark*

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Export Dept.: 13 East 40th St., New York 16, N. Y. Cables "ARLAB"

Aug.-Sept., 1952, Vol. 8, No. 6

Published by
AUDIO DEVICES, INC.
444 MADISON AVENUE, N. Y. 22, N. Y.

audiodiscs
audiotape
audiofilm
audiopoints

Part of the Audio Devices-Magnecord tape recording center set up in Chicago's International Amphitheatre to give radio newscasters local-level coverage of the Republican and Democratic National Conventions. All recordings Magnecorded on Audiotape. Story on Page 2.

In this issue

DIRECTORY OF TAPE RECORDERS

. . . also

- Audiotape at Chicago Conventions
- New Language Lab at SHAPE
- Musical Engineering
- New 7" Reel Design
- New Adhesive Reel Labels

AUDIOTAPE STARS AT CHICAGO CONVENTIONS

New Tape Recording Service Gave Both National Political Conventions Wider Radio Coverage Than Ever Before

A lot of mighty important things went on at Chicago's big National Political Conventions this year. Of course, there were some pretty fundamental differences between the two. But both had one thing in common — plenty of Audiotape. And it played a mighty important part in keeping the public informed on what transpired behind the scenes at these history-making events.

At Convention Time, the big network newscasters are in an ideal position to give complete coverage on a national scale. But the hundreds of small and independent radio stations throughout the country have heretofore been left out in the cold — especially as far as on-the-spot coverage at the local level is concerned.

This year, for the first time, these small stations got a real break — thanks to a unique tape recording service made available through the joint sponsorship of Audio Devices, Inc. and Magnecord, Inc. This service enabled any representative or newscaster from any radio station in the country to supplement the network coverage with on-the-spot tape recordings custom-tailored to the local interests of his particular radio audience.

Under the auspices of the Chicago News Broadcasters Association of Radio News Directors, complete tape recording facilities were set up in the radio and TV area of The International Amphitheatre and in The Conrad Hilton Hotel. This included individual recording booths, professional Magnecord tape recording machines, Audiotape, convention accredited union engineers, and an efficient packaging and mailing service for air mailing the recorded Audiotape back to the home station for broadcast.

Visiting newscasters were able to record interviews with the delegates from their local areas — to record their own local interpretation of convention events as they happened. All without having to bring along any recording equipment or technical personnel, or renting expensive space, lines and loops.

All recordings were made with Magnecord machines on Audiotape — assuring the highest professional quality of all taped program material.

Another view of the busy convention newscasters tape recording center, — sponsored jointly by Audio Devices and Magnecord, Inc. Here, more than 550 programs for a total of 81 radio stations were recorded on Audiotape, and mailed back to the station for local re-broadcast.

In all, more than 550 programs, ranging in length from five to thirty minutes were recorded during the two Political Conventions. Most were 15 minutes in length. Programs were recorded for a total of 81 radio stations in 34 states, Hawaii, the District of Columbia, the British, Canadian, French and Swiss Broadcasting Companies and the Voice of America.

The people who made use of the facilities were just as widely representative. There were Mrs. W. W. Jarrell, a 70-year old grandmother from WKTG, Thomasville, Ga. and Joel Lynch, 17-year old student from WLAG, La Grange, Ga. Convention highlights were reported to WWDC, Washington, D. C. by Hazel Markel, Mutual network commentator, while those to WARL, Arlington, Va., were handled by State Senator Charles R. Fenwick, a delegate.

Practically all the important dignitaries and guests were interviewed in the Magnecord-Audiotape studios. During the Democratic convention, for example, Sen. Russell (Ga.), Sen. Benton (Conn.), Sen. Kefauver (Tenn.), Rep. Roosevelt (N. Y.), Secretary of the Interior Chapman, Sen. Lehman (N. Y.), Mrs. Barkley, Sen. Magnuson (Wash.), Sen. Bird (Va.), James A. Farley, Gov. Battle (Va.), and Gov. Long (Hawaii) were only a few. The same impressive array were Audiotaped during the Republican convention.

In addition to providing the smaller stations with convention coverage to supplement network or press service coverage, these recording facilities were used by network commentators for local shows. It was far easier to get guests at a convenient hour in the Magnecord-Audiotape studios, record them and then feed them back than wait for the jammed network facilities.

Ralph O'Connor, WISC, Madison, Wisc. was typical of another group. These had direct lines from the station. However, it was impossible to get interviews during the broadcast hour in a station distant from the convention centers in the Amphitheatre and Hilton Hotel, so the programs were Audiotaped and fed back on the line at broadcast time.

The entire floor proceedings in the Amphitheatre from start to finish of each convention were also Magnecorded on Audiotape. Pierre Crenesse of the French National Broadcasting System was a familiar figure in the Amphitheatre studio. Each morning he appeared to get the last sentence of each nominating speech or major address as well as 15 seconds of cheering for background to his newscast.

In short, the Audiotape-Magnecord team provided a heretofore unavailable news recording service which brought vital, first-hand information to millions of radio listeners the world over.

audio record
VOL. 8, NO. 6 AUG.-SEPT., 1952

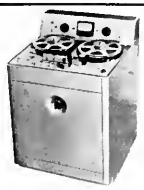
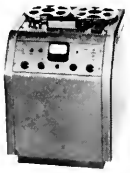
Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

If you're not already on the Audio Record mailing list, and would like to receive it regularly, just send us a post card or letter. There's no cost or obligation, of course.

audio record

QUICK FACTS ON MAGNETIC TAPE RECORDERS

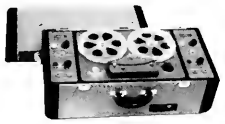
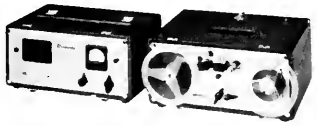
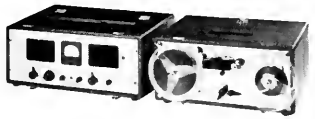
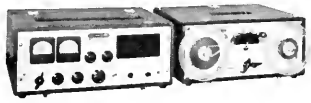
(Additional Information can be obtained by writing to the manufacturer)

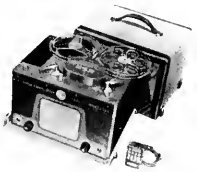
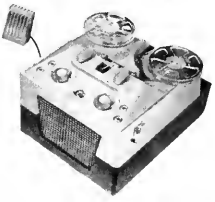
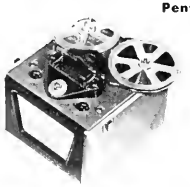
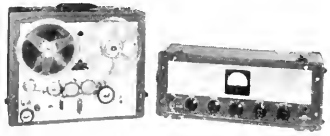
Manufacturer	Model and Price	Frequency Response	Data	Tape
AMPEX ELECTRIC CORPORATION 934 Charter St. Redwood City California	 **Portable** **Model 400-A** **(Dual Track)** **Model 401-A** **(Single Track)** **$985.00**	**50-15,000 cycles (±2 db) at 15"/sec.** **70-10,000 cycles (±2 db) at 7½"/sec.**	Portable, single or dual-track recorder, with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, over 55 db at either speed. Either half-track or full-track recordings can be played back without changes in adjustment. Separate record and playback heads. Instantaneous starting. Rewind time, 1½ min. Simultaneous monitoring. Weight — approx. 80 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base Recommended**
	 **Console** **Model 300-C** **$1,860.00**	**30-15,000 cycles (±2 db) at 15"/sec.** **40-10,000 cycles (±2 db) at 7½"/sec.**	Professional-type, single-track recorder, with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers. Rewind time, 1 min. for full NAB reel. Design flexibility permits modifications for special applications, including multi-channel recording and response beyond 80 KC. Custom built instrumentation machines available with response to 100 KC. Also available in portable and rack-type units.	
	 **Console** **Model 402** **(Dual Track)** **Model 403** **(Single Track)** **$995.00**	**30-15,000 cycles (±2 db) at 15"/sec.** **40-10,000 cycles (±2 db) at 7½"/sec.**	Professional type, single or dual-track recorder with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, over 55 db. Separate record and playback heads and amplifiers. Rewind time, 1½ min. for full 2400 ft. reel. Push-button controls. Timing accuracy, within 3.6 seconds per 30 minutes. Built-in preamplifier. Also available in rack or portable mounting.	
AMPLIFIER CORPORATION OF AMERICA 396-398 Broadway, New York 13, N. Y.	 **"Twin-Trax Magnemuse"** **Model 810B** **(7½"/sec.)** **$285.00**	**50-9,000 cycles (±3 db) at 7½"/sec.**	Portable, dual-track recorder, with automatic reversal—giving up to 1 hour continuous play on 7" reel. Dynamic range, 45 db. Input channels for microphone and radiophono. Total distortion, less than 3%. Shuttle speed in both directions. Weight—42 lb.	**Wound with OXIDE OUT**
	Model 810C **(15"/sec.)** **$345.00**	**30-13,000 cycles (±2 db) at 15"/sec.**		
	 **"Twin-Trax Magnerama"** **Model 910B** **$495.00**	**50-9,000 cycles (±3 db) at 7½" sec.**	Portable, dual-track recorder, with 7½" tape speed and automatic reversal — giving 4 hours continuous play on 13½" reel. Microphone included. Weight—55 lb. Other data same as for "Twin-Trax Magnemuse" above.	**Red or Black Oxide, Plastic or Paper Base**
	"Magnemite" **Model 610-B** **(Dual Track)** **$225.00**	**100-3,000 cycles, at 1⅞"/sec.**	Completely self-contained, battery-operated tape recorders with spring motor drive, especially designed for a wide range of remote recording work. Include provision for playback thru headphones or external amplifier. Dynamic range, 45 — 50 db. Winding interval, 15 min. for Model 610-B; 7½ min. for all others. Can be rewound while operating. Weight, 10 — 15 lb. Overall dimensions, 11 x 8 x 5 in. for Model 610-B; 11 x 10 x 7 in. for all others. Complete accessory equipment available.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
	 **Model 610-C** **(Dual Track)** **$255.00**	**50-5,000 cycles at 3¾"/sec.**		
	Model 610-TD **(Dual Track)** **$275.00**	**50-7,500 cycles, at 7½"/sec.**		
	Battery Operated, Spring Motor Drive **Model 610-SD** **(Single Track)** **$295.00**	**50-7,500 cycles, at 7½"/sec.**		

Manufacturer	Model and Price	Frequency Response	Data	Tape
AMPRO CORPORATION 2835 North Western Ave., Chicago 18, Ill.	 "Ampro-Tape Recorder" Model 731-R $119.75	100-7,000 cycles, at 3¾"/sec.	Portable, dual-track recorder with 3¾" tape speed—giving 2 hours of continuous playing on one 7" reel. Instant stop switch for accurate spotting. Microphone and direct radio, T.V. or phone connection. Rewind time, 4 min. for 7" reel. Includes microphone, 5" x 7" elliptical Alnico 5 PM speaker and jack for external speaker for 3 ohm voice coil or earphones. Weight—17 lbs.	Wound with OXIDE IN Red or Black Oxide, Plastic or Paper Base
BELL SOUND SYSTEMS, INC. 555 Marion Rd., Columbus 7, Ohio	 "RE-CORD-O-fone" Model RT-65-B $186.45	70-8,000 cycles (±3 db) at 7½"/sec.	Portable, dual-track recorder with tape speeds of 1⅞", 3¾" and 7½" per second. Rewind ratio 6 to1. Includes crystal microphone, 6" PM speaker, inputs for microphone and radio-phono, and headphone monitoring jack. Weight—33 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
BROADCAST EQUIPMENT SPECIALTIES CORP. 135-01 Liberty Ave. Richmond Hill 19 N. Y.	 Travis "Tapak" $289.50 plus mike and headphone	100-3,000 cycles at 7½"/sec.	Completely self-contained, battery-operated, spring motor driven unit for single-track recording at 7½" per sec. Records, erases, monitors and plays back through headset. Power rewind, 44" per sec. Winding interval, 5—6 min. Can be rewound while operating. Max. speed variation, 1%. Signal-to-noise, 40—45 db. Includes editing and splicing fixture. Operates with cover closed. Weight, 17 lb. Dimensions, 14 x 10 x 5½ in.	Wound with OXIDE IN Red Oxide, Plastic Base
BERLANT ASSOCIATES 4917 West Jefferson Blvd., Los Angeles 6, Cal.	 "Cancertone" Model 1401 Chassis $345.00	50-15,000 cycles (±2 db) at 15"/sec. 50-9,000 cycles (±2 db) at 7½"/sec.	Professional type single or dual track recorder mechanism and electrical chassis for console installation. Tape speeds, 15" and 7½" per sec. Signal-to-noise ratio, over 50 db. Fast forward and rewind time, 1 min. for 10½" reel. Separate record, erase, and playback heads. Monitors while recording. Carrying case and console available. Weight—50 lb., in case, with 8" speaker.	Wound with OXIDE IN Red Oxide, Plastic Base
	 "Concertone" Network Recorder NWD-1 Drive Mechanism $478.00 NWA-1 Amplifier $317.00	40-15,000 cycles (±2 db) at 15"/sec. 50-9,000 cycles (±2 db) at 7½"/sec.	Professional single or dual-track recorder with tape speeds of 15 and 7½" per second. Signal-to-noise ratio, 55 db. Fast forward and rewind, less than 1 min. for 2500 ft. reel. Starting time 1/10 sec. Separate erase, record and playback heads with facilities for 5 heads. Monitors while recording. Includes manual editing facilities. Amplifier unit includes push-button interlock controls for all mechanical functions. Automatic instant stopping in case of power failure or tape breakage at end of reel. May be mounted in rack, portable cases (as shown), or console.	
THE BRUSH DEVELOPMENT CO. 3405 Perkins Ave., Cleveland 4, Ohio	 "Soundmirror" Model BK-443P $279.50	To 7,000 cycles, at 7½"/sec.	Portable, single-track unit, available with 7½ or 3¾" tape speeds—providing 30 to 60 minutes recording time. Signal-to-noise, over 40 db, Wow and flutter, less than 0.3% RMS. Fast forward and rewind, 75"/sec. Inputs for microphone, radio-phono. Output, 5 ohms, 33 dbm. Includes 6" PM speaker and crystal microphone. Weight—32 lb.	Wound with OXIDE IN
	Model BK-443PS $289.50	To 4,000 cycles, at 3¾"/sec.		
	 "Soundmirror" Model BK-442 $259.50 (mahogany) $269.50 (blond)	To 7,000 cycles, at 7½"/sec.	Table model, single-track units with 7½" tape speed—providing 30 minutes recording time on 7" reel. Signal-to-noise, over 40 db. Wow and flutter, less than 0.3% RMS. Fast forward and rewind, 75"/sec. Inputs for microphone, radio-phono. Output, 5 ohms, 33 dbm. Includes 8" PM speaker and crystal microphone. Weight—33 lb.	Red Oxide, Plastic or Paper Base

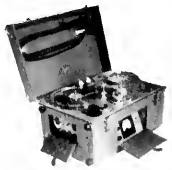
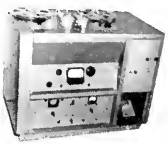
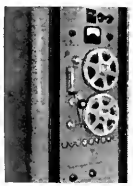
Manufacturer	Model and Price	Frequency Response	Data	Tape
CALIFONE CORPORATION 1041 North Sycamore Ave., Hollywood 38, Cal.	 "Dynacard" Model C3-C3A Rack Panel $799.00 Portable $849.00	50-15,000 cycles (±2db) at 15"/sec. 50-9,000 cycles (±2db) at 7½"/sec.	Portable, single-track, dual-speed recorder designed to NAB Standards. Unique features include direct capstan drive from special slow-speed synchronous motor which eliminates flutter, and clutch-free dynamic braking of tape reels. Signal-to-noise ratio, over 50 db. Fast forward and rewind, 48 sec. for 10½" reel. Three separate heads permit monitoring from tape while recording. Includes VU meter, 2-speed equalization, and separate record and monitor gain controls. Weight—44 lb. for C3 transport mechanism; 33 lb. for C3A amplifier.	Wound with OXIDE OUT Red Oxide, Plastic Base
CRESTWOOD RECORDER CORP. 5990 Northwest Highway, Chicago 31, Ill.	 Crestwood Model CP301 (7½" speed) Model CP302 (3¾ and 7½" speeds) $199.50	50-10,000 cycles (±2 db) at 7½"/sec.	Portable, single or dual speed, dual-track recorder. Signal-to-noise ratio, 48 db. Flutter and wow, 0.5% max. Rewind time, 1 min., 25 sec. for 1200 ft. reel. Input for high impedance mike, radio or phono. Output for external speaker, phone jack for monitoring. Built-in speaker. Weight, 30 lb.	Wound with OXIDE OUT Red Oxide, Plastic Base
	 Crestwood Model 400 $299.50 Complete	40-12,000 cycles at 7½"/sec.	Portable, dual-track recorder with 7½" tape speed. Signal-to-noise ratio, 50 db. Flutter and wow, 0.25% max. Rewind and fast forward speed same as above. Records from microphone, phono or radio. Tone control equalized for maximum performance. Automatic interlock prevents accidental erasure. Power output 10 watts. Built-in 8" speaker. Weight: 22 lb. for recorder and pre-amplifier, 21 lb. for speaker and power amplifier.	
DuKANE CORPORATION St. Charles, Ill.	 "DuKone" Portable Model 11B-55 $229.50	50-8,000 cycles, at 7½"/sec.	Portable, dual-track recorder with 7½" tape speed. Power output, 7 watts. Input channels for microphone and radio-phono. Output jacks for headphones and external speaker. Fast forward speed, 150"/sec. Rewind time, 80 seconds for 7" reel. Microphone and built-in 6"x9" speaker included. Weight—26 lb.	Wound with OXIDE OUT Red Oxide, Plastic or Paper Base
	 "DuKane" Portable Model 11A-75 $279.50	50-10,000 cycles, at 7½"/sec. 50-7,500 cycles, at 3¾"/sec.	Portable, dual-track recorder with tape speeds of 3¾ and 7½" per sec. Signal-to-noise ratio, 50 db on playback. Rewind time, 80 sec. for 7" reel. Fast forward, 2¾ min. for 7" reel. Keyboard controls for selection of recording facilities—microphone, radio or phono, tape copying, playback and PA system. Output, 7½ watts. Includes 6 x 9 in. speaker. Weight—35 lb.	Wound with OXIDE IN Red Oxide, Plastic Base
ECTRO INC. Delaware 1, Ohio	 "Cub Carder" Battery Operated Portable $295.00	200-600 cycles, at 7½"/sec.	Completely self-contained battery-operated, dual-track recorder with tape speeds of 3¾" and 7½" per sec. Also available with 1⅞" and 3¾" speeds. Fast forward and rewind, 37" per second. Power supply, rechargeable wet cells and dry batteries. Instantaneous playback through microphone. Simplified circuit with constant-speed motor. Size, 12¼ x 13¼ x 5⅝ in. Weight, 12⅞ lb.	Wound with OXIDE IN Red Oxide, Plastic Base

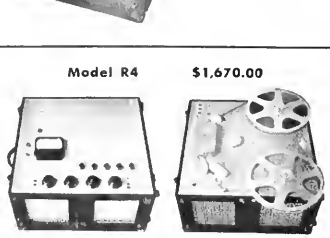
Manufacturer	Model and Price	Frequency Response	Data	Tape
EDUCATIONAL LABORATORIES, INC. 1625 Conn. Ave. N. W. Washington 9, D. C.	"Educorder Dual" $450.00 	to 5,000 cycles, at 3¾" sec.	Portable tape recorder with two separate channels, each having its own amplifier and record-playback and erase heads. Can record and play back two channels simultaneously for binaural effect or record on one channel while listening on the other. Tape speed, 3¾" per second (7½" optional). Wow and flutter, less than 1.3% RMS. Fast forward and rewind, 20:1 ratio. Radio and mike input for each channel. Three output connections: Channel 1, Channel 2 and "Dual" for binaural headphones. Weight, 26 lb.	Wound with OXIDE IN Red or Black Oxide, Plastic or Paper Base
EICOR, INC. 1501 West Congress St., Chicago 7, Ill.	 Portable Model 230 $160.00 (Approx.)	70-8,000 cycles at 7½"/sec. 70-4,000 cycles, at 3¾"/sec.	Portable, dual or single track recorder with dual-speed capstan for 7½" and 3¾" tape speeds. Provides up to 2 hrs. recording time on 7" reel. Amplifier equalized for both speeds. "Finger-Flip" controls for mechanical and amplifying systems. Volume peak indicator window. Safety lock prevents accidental erase. Crystal microphone and 5" x 7" speaker included. Weight—28 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
FAIRCHILD RECORDING EQUIPMENT CORP. 154th St. and 7th Ave., Whitestone, N. Y.	 Console Model Unit 126 $2,750.00	50-15,000 cycles (±1 db) at 15"/sec.	Professional type, single-track recorder with 15" tape speed (7½" and 30" models available). Total noise and distortion -64 db (ref. 2½% dist.). Adjustable bias. Speed tolerance, 0.1%. Built-in VU meter and circuit checking. Unit-type, plug-in chassis. Automatic stop — instant braking and reversal. Full protection against accidental erase.	
	Console Model "PIC-SYNC" $4,000.00	50-15,000 cycles (±1 db) at 15"/sec.	Same as model 126 with the addition of lip synchronous operation. Used with motion picture camera and film projector, synchronous sound tracks are made and played back on ¼" tape, with no interconnecting equipment. Automatic Framing, which assures correct cueing of tape and film, available at additional cost. Other applications include Facsimile recording, multi-track, and telemetering, with frequency response to 100 KC.	Wound with OXIDE IN Red Oxide, Plastic Base
	 Control Track Generator Model 141 $200.00		Portable light weight unit for "On Location" picture synchronous sound track recording on ¼" tape. Used with any portable tape recorder with 15"/sec. tape speed and frequency response good to 14 KC., a control track is simultaneously applied which later becomes the tape speed control when played back on Pic-Sync recorder.	
THE GENERAL INDUSTRIES COMPANY Elyria, Ohio	Tape-Disc Recorder Assembly Model 250 $79.50 	(depends on amplifier used)	Combined disc and tape recorder assembly for installation in console or portable case. Tape speed, 3¾"/sec., dual track. Fast forward and reverse. PM erase. Takes 5" reels. Disc recorder cuts and plays back up to 10" discs, at 78 rpm. Records from tape to disc and vice versa — and from microphone or radio to disc or tape.	Wound with OXIDE IN Red or Black Oxide Plastic or Paper Base
MAGNETIC RECORDING INDUSTRIES LTD. 30 Broad St., New York 4, N. Y. (Continued on next page)	"Voice-Master" Magnetic Disc Dictating Machine $175.00 	Voice Frequency Only	Portable magnetic-disc dictating and transcribing machine using mailable and re-usable paper discs with magnetic oxide coating. "Correct-O-Matic" feature erases previous dictation while recording changes or corrections. Visual record-listen indicator. "Split-A-Word" instant start and stop control. "Codit" scrambler available for confidential dictation, making recording unintelligible unless transcribed on machine with identical coding unit. Complete line of dictation and transcription accessories available. Price listed does not include microphone. Weight —11 lb.	Uses Special Paper Base Magnetic Discs

Manufacturer	Model and Price	Frequency Response	Data	Tape
MAGNETIC RECORDING INDUSTRIES LTD. 30 Broad St., New York 4, N. Y.	 **Portable** **Model VM-57** **$395.00**	**to 10,000 cycles (±2 db) at 7½"/sec.**	Portable, single-track recorder with tape speed of 7½" per second. (Also available with speeds of 2", 3¾", or 15" per sec.) Separate record, playback and monitor amplifiers. Separate bass and treble controls. Radio and microphone inputs may be used simultaneously. Plug for foot controlled stop and start. Fast forward and rewind. Dual-track units can be supplied at same price. Weight 24½ lb. Complete line of dictating and transcribing accessories available.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
	"Synchrotone" Dual Magnetic Recorder  **Model VM-58** **$439.00**	**to 7,000 cycles, at 7½" sec.**	Portable tape recorder with two separate recording and reproducing channels. Permits synchronous recording or playback of two different events, synchronous playback of one event and simultaneous recording of another, or simultaneous two-channel recording or playback of same event for binaural effect. Independent control of record, erase and playback on each channel. Two inputs per channel. Fast forward and rewind, 75" per sec. Wow and flutter, less than 0.3% RMS. Weight—26 lb.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic or Paper Base**
MAGNECORD INC. 360 North Michigan Ave., Chicago 1, Ill.	**Model PT6-J Amplifier $248.00** **Model PT6-AH Recorder $316.00** 	**50-15,000 cycles (±2 db) at 15" sec.**	Portable single-track, professional type recorder with interchangeable capstans for 15 and 7½" tape speeds. Also available with dual-track heads and with dual speed motors for three speed operation. Fast forward and rewind speeds. Two separate heads. Combination record/playback amplifier. Flutter, 0.3% max. Low impedance mike input, bridging input, monitor speaker, O-level output terminal, VU meter, terminal for external speaker.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	Model PT63-J Amplifier $387.00 **Model PT63-AH Recorder $350.00** 	**50-15,000 cycles (±2 db) at 15" sec.**	Same as above, except with three separate heads for erase, record, and playback for monitoring from tape while recording. PT63-J amplifier has separate record and playback amplifiers, and switch for equalization at 7½ and 15" tape speed.	
	Binaural Amplifier Model PT6-BN $515.00 **Binaural Recorder Model PT6-BAH $364.50** 	**50-15,000 cycles (±2 db) at 15" sec.**	Portable dual channel recorder designed for binaural recording and reproduction (using simultaneous inputs from two microphones and outputs to two speakers or binaural headphones). Separate record playback head for each channel—also separate gain controls and VU meters. Signal-to-noise ratio, 47 db per channel. Flutter, 0.3% max. Fast forward and rewind speeds. Includes speaker for monitoring either channel. Binaural conversion equipment available for use with existing Magnecord machines.	
	 **"Magne Cordette"** **$385.00** **Complete**	**50-15,000 cycles (±3 db) at 15" sec.**	PT6-AH Magnecorder and "custom" amplifier mounted in attractive blonde or mahogany cabinet. Amplier unit serves as recording amplifier and playback pre-amplifier for use with separate high fidelity or radio amplifier. Can be supplied with single or dual track heads. Tape speeds of 15" or 7½" per second with interchangeable capstan. Three-speed units also available. Fast forward and rewind speeds. Flutter, 0.3% max. Hi-impedance inputs for microphone and radio-phono.	
PREMIER ELECTRONIC LABORATORIES 382 Lafayette St., New York 3, N. Y.	 **"Tapesonic"** **Model 70** **$298.50**	**40-15,000 cycles, at 15" sec.** **40-12,000 cycles, at 7½" sec.** **40-7,000 cycles, at 3¾" sec.**	Portable, professional-type, dual track recorder with tape speeds of 15", 7½" and 3¾" per second. Fast forward and rewind, less than 1 min. for 2500 ft. reel. Flutter and wow, 0.1% at 15" per second. Mixing channels for mike, radio and phone inputs. Monitoring speaker attenuator. Three heavy-duty dynamic balanced motors. Includes 8" speaker. 12 watts audio output. Weight—54 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**

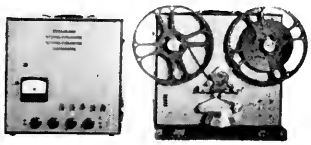
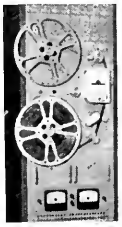
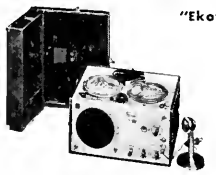
Manufacturer	Model and Price	Frequency Response	Data	Tape
MARK SIMPSON MFG. CO. INC. 32-28 49th St., Long Island City 3, N. Y.	 "MASCO" Model 52L $160.00 Model 52LR (with radio) $196.00	80-8,500 cycles (±3 db) at 7½"/sec. 80-5,000 cycles (±3 db) at 3¾"/sec.	Portable, dual-track, dual-speed recorders, arranged for instant change from 7½ to 3¾" per sec. Up to 2 hours recording time available on 7" reel. Signal-to-noise ratio, 45 db at 7½". Automatic equalization. Neon recording level indicator, volume and tone control, monitor switch, 6" PM speaker, and microphone. AC erase and bias. Microphone and radio-phono inputs. External speaker and amplifier outputs. Available with or without built-in AM tuner. Weight of mechanism (less case), 30 lb.	Wound with OXIDE IN Red Oxide, Plastic Base
	 "MASCO" Model 52C $179.50 Model 52CR (with radio) $215.50		Models 52L and 52LR, without carrying case. Models 52 and 52R, with two-tone tweed carrying case. Models 52C and 52CR have metal cover with carrying handle. Cover operates interlock switch and can be locked with key.	
	 "MASCO" Model 52 $179.50 Model 52R (with radio) $215.50			
THE PENTRON CORP. 221 E. Cullerton St., Chicago 16, Ill.	Portable Model 9T3-C $179.50 	50-8,000 cycles, at 7½"/sec. 50-5,000 cycles, at 3¾"/sec.	Portable, dual-track, dual-speed unit (7½" and 3¾")—providing 2 hours recording on 7" reel. Signal-to-noise ratio, 50 db. Flutter less than 0.5%. Fast forward and rewind ratio, 20 to 1. Inputs for microphone and radio-phono. Outputs for headphones, external speaker, and PA system. Includes 6" PM speaker and crystal microphone. Weight —27 lb.	Wound with OXIDE IN Red Oxide, Plastic or Paper Base
	Pentron Tape Player  Model PB-1 $99.50 Model PB-A2 $119.50	50-8,000 cycles, at 7½"/sec. 50-5,000 cycles, at 3¾"/sec.	Portable magnetic tape reproducer, for playback only of any standard ¼" tape recorded with dual track at 7½" or 3¾" per second (single track heads available at slightly higher cost.) Flutter less than 0.5%. Fast forward and rewind speed, 20 to 1. Model PB-1 consists of player and pre-amp only. Weight—19 lb. Model PB-A2 is complete with amplifier and speaker. Weight—22 lb.	Wound with OXIDE IN Red or Black Oxide, Plastic or Paper Base
PRESTO RECORDING CORP. P. O. Box 500, Hackensack, N. J.	 RC-7 Transport Mechanism $425.00 A-920 Amplifier $324.00	To 15,000 cycles, at 15"/sec.	Professional type equipment for portable or stationary use. Tape transport mechanism has true three-motor drive and separate recording and reproducing heads. Instantaneous monitoring from tape is provided. Input for single microphone or high impedance bridging. Output, 10 watts. Also zero level line. Two speakers are mounted in amplifier for playback. Monitoring output for 'phones.	Wound with OXIDE IN Red Oxide. Plastic or Paper Base
	 Model RC-10-14 $684.00 Model RC-10-24 $761.00	To 15,000 cycles, at 15"/sec.	Professional, single-channel, dual-speed recorders (15" and 7½"/sec) for rack mounting. Three separate heads, permitting monitoring from tape while recording. Three-motor drive mechanism. Fast forward and reverse. RC-10-14 controlled by rotary type selector switch. RC-10-24 completely push-button controlled. Can be arranged for remote operation.	

(Continued on next page)

Manufacturer	Model and Price	Frequency Response	Data	Tape
PRESTO RECORDING CORP. P. O. Box 500, Hackensack, N. J.	 **Console Model SR-950** **$2,785.00**	**50-15,000 cycles (±1 db) at 15"/sec.**	Professional, single-channel recorder, with 15 and 7½" tape speeds (15" and 30" optional). Signal-to-noise ratio, over 58 db below max. signal. Fast forward and reverse, 240 ft./sec. Three separate heads. VU meter. Amplifier and power supply units on hinged panel	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
	 **Tape Drive Model TL-10** **for 7½" or 15" tape speed $132.50** **for 7½" and 15" tape speeds $140.00**	**50-15,000 cycles, at 15"/sec.** **— subject to limitations of amplifier used**	Compact tape transport mechanism and reproducer, arranged to be mounted on and driven from any standard 16-inch turntable. Does not include provision for erase or recording. Equalized output of playback head may be fed directly into standard speech input equipment. Accommodates standard 7-inch reels. Tape speeds indicated are based on turntable speed of 78 rpm.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic or Paper Base**
RANGERTONE INC. 73 Winthrop St., Newark 4, N. J.	 **"Rangerette" Portable Model A-2** **$1,500.00 complete**	**45-15,000 cycles (±2 db) at 15"/sec.** **50-8,000 cycles (±2 db) at 7½"/sec.**	Professional-type, single-track, dual-speed recorders, with choice of 3¾", 7½", 15" or 30" per second tape speeds. Up to 2 hours recording at 7½" per sec. on 14" reel. Distortion, less than 2% total harmonic. Maximum signal-to-tape noise, 55 db. Double-puck, tight-loop tape drive. Peak-to-peak flutter, less than 0.1% at 15"/sec. Rewind speed controllable continuously from 0 to 250"/sec. in both forward and rewind. Meets all N.A.B. adopted standards. Complete monitoring and mixing facilities. VU meter, signal indicator and footage counter calibrated in minutes and seconds. Complete tape editing facilities. Also available with positive "sprocketless" synchronization for motion picture and TV applications. Weight of Rangerette — 30 lb.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic Base**
	 **Console Model R-5C (with synchronizer)** **$4,477.00**	**45-15,000 cycles (±2 db) at 15"/sec.** **50-8,000 cycles (±2 db) at 7½"/sec.**		
RCA BROADCAST EQUIPMENT SECTION Camden, N. J.	 **Cabinet Rack Model RT-11A** **$1,975**	**50-15,000 cycles (±2 db) at 15"/sec.** **50-5,000 cycles (±2 db) at 7½"/sec.**	Single-track, dual-speed professional type recorder, available in cabinet rack or console mounting. Separate erase, record and playback heads permit simultaneous recording and monitoring. Distortion, less than 1% at 10 db below maximum level. Signal-to-noise, 60 db below maximum level. Wow and flutter, 0.1% at 15" per sec. Fast forward and rewind time, 60 sec. for 2400 ft. reel. Timing accuracy, ±2½ sec. for 30 minute run. Instant stop and start (within 1/10 sec.). All control functions push-button controlled. Remote push-button control also available.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	 **Console Model RT-12A** **$2,270**			

Manufacturer	Model and Price	Frequency Response	Data	Tape
REVERE CAMERA CO. 320 East 21st St., Chicago 16, Ill.	 **Model T-700** **2 hour play** **$225.00** **Model TR-800** **2 hour play** **(with radio)** **$250.00**	**80-8,000 cycles (±3 db) at 3¾"/sec.**	Portable dual-track recorder available in either 3¾" or 7½" per second tape speed. Signal-to-noise ratio, over 50 db at either speed. Distortion less than 1%. Rewind and fast forward speed, 170" per second. Flutter less than 0.3%. Solenoid operated. Two neon lamps for more accurate level setting. Can be operated as a P.A. 6" x 9" Alnico V speaker. Weight—30 lbs.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic or Paper Base**
	Model T-10 **1 hour play** **$235.00** **Model TR-20** **1 hour play** **(with radio)** **$260.00**	**60-15,000 cycles (±3 db) at 7½" sec.**		
SCRIBE CORPORATION 2835 N. Kedzie Ave., Chicago 18, Ill.	 **Permoflux Scribe Dictating Unit** **$354.50**	**Ample for all voice recording**	Compact magnetic tape recorder designed for varied business purposes. Same recorder, with different accessories, serves as either a dictating or transcribing unit. Dictating unit includes microphone with control switch. Transcribing unit includes single earphone and dual foot control. Simple "cartridge" loading eliminates threading. Tape speed, 3¾" per sec. Recording time, ½ hour per magazine. Includes provision for card indexing of corrections, extra carbons, length, rush, etc. Available accessories include: carrying case, telephone pick-up, magazine packet, tape mailing envelopes, dual foot control, single or double earphones, paddle-type or conference "mike," microphone adapter, external speaker and extra tape magazines	**Wound with OXIDE IN** **Red Oxide, Paper or Plastic Base**
	 **Permoflux Scribe Transcribing Unit** **$361.30**			
SPEAK-O-PHONE RECORDING AND EQUIPMENT CO. 23 West 60th St., New York 23, N. Y.	 **Speak-O-Phone "Superior" Tape-Disc Recorder** **Model TD52** **$299.50**	**Amplifier Response, 60-8,000 cycles per sec.**	Portable combination tape and disc recorder, with 3¾" tape speed (dual tract) and 78 rpm turntable (12" capacity). Records from microphone or radio to tape or disc, from disc to tape or from tape to disc. Plays back from tape or disc. Accommodates 5" tape reels. Fast forward and reverse tape speeds. Includes crystal microphone and 5" x 7" speaker. Weight—30 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
THE STANCIL-HOFFMAN CORP. 1016 North Highland Ave., Hollywood 38, Cal.	 **"Minitape" Model M5A** **$249.00**	**100-5,500 cycles (±2 db) at 7½" or 15"** **100-4,000 cycles (±2 db) at 3¾"/sec.**	Portable, single-track recorder with tape speeds of 3¾, 7½ and 15" per sec. Signal-to-noise ratio, at least 35 db. Completely self-contained battery operated unit (recording only). Weight—13 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic Base**
	Model R4 **$1,670.00** 	**50-15,000 cycles (±1 db) at 15"/sec.**	Portable, professional-type, single-track recorder with tape speeds of 7½ and 15" (or 15 and 30") per sec. Signal-to-noise ratio, over 60 db. Separate record and playback heads and amplifiers with independent monitor amplifier and speaker	

(Continued on next page)

Manufacturer	Model and Price	Frequency Response	Data	Tape
THE STANCIL-HOFFMAN CORP. 1016 North Highland Ave., Hollywood 38, Cal.	 **Model 55 Synchronous Magnetic Film Recorder and Reproducer $2,142.00**	**45-7,500 cycles (±2 db) 16mm** **45-15,000 cycles (±2 db) 17½mm**	Synchronous magnetic film equipment for motion picture and TV sound recording. Includes proper speed and equalization for both 16mm and 17.5mm film width. Full synchronous sprocket drive arranged for forward or reverse recording or playback. Also fast forward and reverse for editing. Gearless drive. Signal-to-noise, at least 50 db. Max. harmonic distortion, 1.5% from full level. Playing time: up to 1 hr. for 16mm, up to 24 min. for 17.5mm. 2,000-ft. reel capacity.	**Uses Magnetically Coated 16mm and 17.5mm Film**
	 **Model CRM-15 Multi-Channel Communications Recorder** **(Prices on Request)**	**200-7,500 cycles (±3 db) at 7½"/sec.** **200-3,500 cycles (±3 db) at 3¾"/sec.**	Provides up to 15 simultaneous recording channels on 0.7" wide tape. Recording time, up to 4½ hours for 1,000 foot reel. Two units, with automatic sequence control permit continuous, 24-hour recording. Signal-to-noise, at least 40 db. Distortion, not more than 5% total harmonic at "0" input level. Negligible crosstalk between channels. Push-button control. Fast forward and rewind. Automatic stop.	**Uses Special 0.7" Plastic or Paper Base Tape**
TELECTRO INDUSTRIES CORP. 35-16 37th St., Long Island City 1, N. Y.	 **Telectro Portable Model TR-175** **$750.00**	**50-9,000 cycles, at 7½" sec.** **50-5,000 cycles, at 3¾" sec.**	Portable, dual track, dual speed unit operating at 7½ and 3¾ in. per second. Signal-to-noise ratio, better than 45 db. Flutter less than 0.5%. Separate mike and telephone line inputs. Provision for control by microphone pushbutton, foot pedal forward and backspace, and automatic voice operation. Precise counter index for accurate spacing. Built-in PA amplifier with separate control, and 6" PM speaker with external speaker connection. Ruggedized for military service. Weight—43 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
WEBSTER CHICAGO CORPORATION 5610 Bloomingdale Ave., Chicago 39, Ill.	 **Web-Cor Portable Model 210** **$187.50**	**70-7,500 cycles at 7½"/sec.** **70-4,000 cycles at 3¾"/sec.**	Portable, dual-track recorder with tape speeds of 3¾" and 7½" per sec. Gives up 2 hours recording on 7" reel. Records or plays in both directions without reel turnover. Fast forward and rewind. Two recording heads and two motors. Signal-to-noise, 35 db. Amplifier automatically equalized for both speeds. Includes electronic eye volume level indicator, 6" PM speaker and microphone. Input for microphone or radio. Phono output for external speaker, amplifier or PA system. Weight—38 lb.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic Base**
WEBSTER ELECTRIC CO. Racine, Wisc.	 **"Ekotape" Model 114** **$179.50**	**50-4,500 cycles, at 3¾" sec.**	Portable, dual-track recorders with 3¾" or 7½" tape speed—giving 2 or 1 hour recording time respectively on 7" reel. Fast forward and rewind, 75" per sec. Neon recording level indicator. Input jacks for microphone and radio-phono. Output jack for external speaker. Includes 5"x7" PM speaker and crystal microphone. Foot switch available as an accessory. Weight—34 lb.	**Wound with OXIDE IN** **Red or Black Oxide, Plastic or Paper Base**
	Model 116 **$179.50**	**50-7,500 cycles at 7½" sec.**		
	 **"Ekotape" Portable Model 101-8** **$385.50** **Model 101-9** **$412.50**	**40-10,000 cycles, at 7½"/sec.**	Portable, single-track recorder with 7½" tape speed. Fast forward and rewind, 75" per sec. Electronic eye recording level indicator. Inputs for microphone and radio-phono. Output for external speaker. Includes 8" PM speaker. Weight—50 lb. Model 101-8 includes crystal microphone. Model 101-9 includes receptacle for connecting a remote control foot switch.	

Manufacturer	Model and Price	Frequency Response	Data	Tape
WILCOX-GAY CORP. 385 4th Ave. New York 10, N. Y.	 **"Tape Recordio"** **Model 3A10** **(7½" and 3¾"/sec.)** **Model 3A11** **(3¾" and 1⅞"/sec.)** **$159.95**	**75-10,000 cycles (±3 db) at 7½"/sec.** **80-6,000 cycles (±3 db) at 3¾"/sec.** **100-5,000 cycles (±3 db) at 1⅞"/sec.**	Portable, dual-track tape recorders with tape speeds of 7½ and 3¾ in. per second or 3¾ and 1⅞ in. per second. Signal-to-noise; 55 db for 3A10, 45 db for 3A11. Neon normal and overload record level indicators. Inputs for microphone and radio-phono-TV. Jack for external speaker. Fast forward and rewind. Keyboard control of all recording functions. Includes microphone and built-in speaker. Weight—23 lb.	**Wound with OXIDE IN** **Red Oxide, Plastic or Paper Base**
	 **"Tape Recordio"** **Model 3F10** **$179.95**	**55-10,500 cycles (±3 db) at 7½"/sec.** **75-7,500 cycles (±3 db) at 3¾"/sec.**	Portable, dual-track, dual-speed tape recorder, operating at 7½" and 3¾" per second. Signal-to-noise, 57 db. Balanced push-pull circuit. Other features, controls and facilities similar to 3A10 described above. Also includes compartment in case for storing extra tape reels and connecting cord. Weight—25 lb.	
	 **"Tape-Disc Recordio"** **Model 3C10** **$199.95**	**80-6,000 cycles (±3 db) at 3¾" sec.**	Portable combination tape and disc recording and reproducing unit, with tape speed of 3¾" per second (dual track) and 78 rpm disc speed. Signal-to-noise, 45 db. Transfers recordings from tape to disc or vice-versa. Jack for external speaker. Neon normal and overload recording level indicators. Fast forward and rewind speeds. Includes microphone and built-in speaker. Weight—30 lb.	

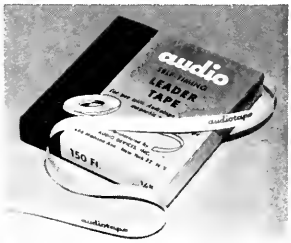
RECORDING TIME

For Various Tape Speeds and Reel Sizes

REEL SIZE		3"	4"	5"	7"	10½"	14"
LENGTH IN FEET							
Audiotape		150	300	600	1200	2500	5000
Other Types		150	300	600	1200	2400	4800
RECORDING SPEED		TOTAL RECORDING TIME (Based on Audiotape footage)					
1⅞" per sec.	Single Track	16 min.	32 min.	1 hr. 4 min.	2 hr. 8 min.	4 hr. 26 min.	8 hr. 52 min.
	Dual Track	32 min.	1 hr. 4 min.	2 hr. 8 min.	4 hr. 16 min.	8 hr. 52 min.	17 hr. 44 min.
3¾" per sec.	Single Track	8 min.	16 min.	32 min.	1 hr. 6 min.	2 hr. 13 min.	4 hr. 26 min.
	Dual Track	16 min.	32 min.	1 hr. 4 min.	2 hr. 12 min.	4 hr. 26 min.	8 hr. 52 min.
7½" per sec.	Single Track	4 min.	8 min.	16 min.	32 min.	1 hr. 6½ min.	2 hr. 13 min.
	Dual Track	8 min.	16 min.	32 min.	1 hr. 6 min.	2 hr. 13 min.	4 hr. 26 min.
15" per sec.	Single Track	2 min.	4 min.	8 min.	16 min.	33⅓ min.	1 hr. 6½ min.
	Dual Track	4 min.	8 min.	16 min.	32 min.	1 hr. 6½ min.	2 hr. 13 min.
30" per sec.	Single Track	1 min.	2 min.	4 min.	8 min.	16½ min.	33⅓ min.
	Dual Track	2 min.	4 min.	8 min.	16 min.	33⅓ min.	1 hr. 6½ min.

THE COMPLETE AUDIOTAPE* LINE

	Length in Ft.	Reel	Coating	PLASTIC BASE Type No. Oxide Out	PLASTIC BASE Type No. Oxide In	PLASTIC BASE List Price	PAPER BASE Type No. Oxide Out	PAPER BASE Type No. Oxide In	PAPER BASE List Price	Std. Pkg.
	150	3" Plastic	Red Oxide	150	151	$0.85	120	121	$0.70	10 30
	300	4" Plastic	Red Oxide	350	351	1.60	320	321	1.25	10 30
	600	5" Plastic	Black Oxide	640	641	3.50	600	601	2.25	5 10
			Red Oxide	650	651	3.50	620	621	2.25	30
	1200	7" Plastic	Black Oxide	1240	1241	5.50	1200	1201	3.50	5 10
			Red Oxide	1250	1251	5.50	1220	1221	3.50	30
	2500	Std. NAB Aluminum Hub	Red Oxide	—	2551H	10.00	—	2521H	6.50	5
		Complete 10½" Aluminum Reel	Red Oxide	—	2551R	12.85	—	2521R	9.35	5
	5000	Std. NAB Aluminum Hub	Red Oxide	—	5051H	20.00	—	—	—	5
		Complete 14" Aluminum Reel	Red Oxide	—	5051R	26.00	—	—	—	5



AUDIO SELF-TIMING LEADER TAPE

on white *plastic base*

A ¼" wide leader tape of durable white plastic material. It can easily be marked with pencil or ink to identify selections and will outlast paper tapes many times over. Spaced markings permit accurate timing at all standard speeds. Individually boxed in 150-ft. rolls.

Box of 150 ft.

List Price
$0.60

*Trade Mark

New Tape Recording Language Lab for SHAPE Headquarters

Educational Laboratories, Inc. of Washington, D. C., whose activities have been reported by Audio Record in the past, has installed another language laboratory, this time at SHAPE headquarters in Paris, France. Starting with the first truly custom engineered laboratory for language teaching at Georgetown University, Educational Laboratories, Inc. has been responsible for similar installations at various places in the United States, and in Yugoslavia, France, Puerto Rico and the Philippines, thus extending its influence nearly around the world.

The new laboratory in Paris has been installed in General Eisenhower's old headquarters, Supreme Headquarters Allied Powers Europe. The laboratory consists of twelve semi-soundproof student booths (the booths that are becoming the familiar feature of Educational Laboratories' installations) and is the first such laboratory built around the new Educorder Dual two channel tape recorder which is described in the "Quick Facts" directory in this issue. The Educorder Dual provides ideal facilities for individualized instruction and a close teacher student relationship, thus meeting the needs of the eighty-eight generals and admirals who wish to study languages at SHAPE but find it impossible to attend regular classes.

While the laboratory is designed primarily for individual work, each booth is equipped with four incoming audio lines which can be patched into the student's Educorder. Signals emanate from the back of the room and are channeled through a custom control console. Signals may originate from a public address microphone, a microgroove disc player, a Soundmirror, or from either of two Educorder Dual "master" machines.

Facilities are also provided through a "black box" custom designed by ELI, and to be offered soon for public sale, for synchronizing a tape recorded lecture with film strip or slide material by having a special signal on the tape actuate an automatic projector.

The new laboratory makes it possible for one of the Generals to sit down at his booth and have a private audio-visual language lesson in French while his neighbor is working on an entirely different language. Patching in and recording a signal from one of the master machines at the back of the room permits the student to record the original lesson on channel 1 of his Educorder while recording his individual responses on channel 2 of his machine. Later, he can use the same tape for review, erasing and re-recording on channel 2 without destroying the teacher's recording on channel 1 and without tying up the master equipment for a second time. Plastic Audiotape is used exclusively.

The new laboratory in one of the most famous headquarters on earth is causing a great deal of interest among educators in Europe who will no doubt prove to be quite vocal about this newest Yankee technique designed to eliminate our language barriers.

MUSICAL ENGINEERING

By Harry F. Olson,
McGraw Hill Book Co.,
347 Pages — $6.50

. . . as reviewed by C. J. LeBel

A new book by Dr. Olson has always been an event, and this one is no exception to the rule. It is a survey of the musical acoustics field from that most unusual viewpoint, the engineer's, and should be of interest to almost everyone in recording. If you have a complete file of *all* the literature for the last twenty-five years, only portions of Musical Engineering will be new to you, but if your library is typical then it is well worth a full reading from cover to cover. It should be required reading in acoustics courses, as a staircase down from the physicist's moss-grown ivory tower.

Dr. Olson starts with the production of sound waves, then takes up musical notation, scales, and jargon. After touching on dynamic analogies, he studies resonators, radiators, and the full gamut of musical instruments. The writer found his data on the tonal and directional properties of musical instruments very interesting. Dr. Olson then takes up the characteristics of the ear, followed by a study of theater, studio, and room acoustics. He concludes with sound recording systems in block diagram form.

Since he has been in very intimate touch with the development of sound recording and reproduction systems for many years, the discussion is on the whole both accurate and up to date. We would expect this, for it was one of his works which, first among engineering books, recognized that lacquer had virtually completely replaced wax as a disc recording medium. There are still books being published which ignore lacquer and treat wax in detail.

It takes time to write a book, so there are a very few places where "Musical Engineering" has picked old data to lead to an obsolete conclusion. For example, in talking about home reproducing systems he says: "Attempts have been made to increase the frequency range, but without public acceptance". The phenomenal growth of the high fidelity home market in the last year has fairly well disproved this. Also, Olson says: "Tests made upon representative cross-sections of the people in this country show a very large percentage to be hard of hearing". This is undoubtedly based on some of the very first published tests of hearing. Subsequent work has shown that, with more accurately calibrated audiometers and truer samples of the population, the percentage of "hard of hearing" has shrunk to a small fraction of what it orginally was thought to be. It would have been better to say "defective hearing" instead, for a substantial percentage do not have perfect hearing — just as most new automobiles have at least one scratch — somewhere — before they are delivered. They are "defective", but not to a degree which the customer notices! The distinction between "hard of hearing" and "defective hearing" has been too often neglected. We had to read the entire book to find these examples, so they are definitely not typical of the book as a whole.

MUSICAL ENGINEERING is written with unusual clarity, so engineer, musician, and layman will find it useful. The musician and layman will find the book quite readable by skipping the mathematics, while the engineer will find the quantitative data he relies on. The jacket note says, "An engineering treatment of the interrelated subjects of music, musical instruments, speech, acoustics, sound reproduction, and hearing". An accurate description of a book we recommend.

audio pointers for the Recordist

by C. J. LeBel, Vice President
Audio Devices, Inc.

A NEW SEVEN INCH REEL DESIGN

C. J. LeBel

It is a sad fate that meets standards in a changing world. There is always pressure from the user for the quick standardization of *something* — *anything* — for the sake of uniformity. Thus we take the chance of adopting a design even though a few still voices point out the dangers, because a poor standard is still better than triple distilled chaos. Then we repent at leisure. The tape industry is beginning a period of very mild repentance, and out of it is coming a new reel.

Friction Clutches

A very large proportion of the lower cost magnetic recorders presently manufactured use friction clutches to drive the takeup reel and hold back the supply reel. This avoids the high cost of torque motors.

The most obvious design of clutch will maintain a constant torque (or inch-pounds) as the tape unwinds and its diameter on the reel decreases. That is,

torque = tape tension x radius = constant

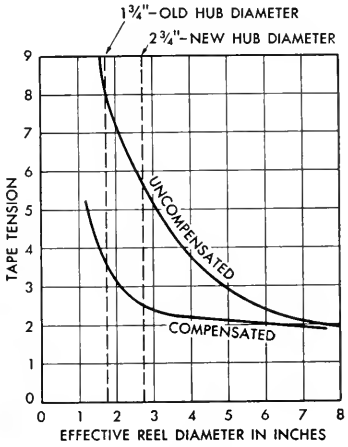
If we transpose, this becomes

$$\text{tension} = \frac{\text{constant}}{\text{radius}}$$

In other words, tape tension becomes inversely proportional to the radius of wind.

The nature of this relation becomes apparent if we look at the "uncompensated" curve of figure No. 1.

In actual practice a certain degree of compensation can be introduced, by changing the clutch torque with slip speed — using the changing coefficient of friction with speed, or the changing weight of the reel as more tape is added. This tends to produce a curve more like the "compensated" curve. However, the compensation usually ceases to be very effective at small diameters.



The Problem

It may be seen that, in any case, there is a steep rise in tape tension as we approach the minimum diameter — that of the hub. This condition is most serious during high speed rewind, but it should not be disregarded even at normal recording speed. We can shift the whole curve up or down, without change of shape, by changing the clutch tension. This is not too helpful, because the limit of change is set by inadequate tension with a full reel — leading to impaired high frequency response.

Getting down to fundamentals, we find the basic source of trouble to be the excessive ratio of diameters over which we have to work — 1¾" to 7" or 10½". The obvious answer is to decrease the ratio by increasing the minimum diameter — the hub — as much as feasible without making it impossible to put enough tape on the reel.

The Solution

For this change of the 7" RTMA reel we have chosen to use the time-tested NAB hub diameter of 2¾". With an uncompensated friction clutch drive this reduces the tension at the minimum winding diameter by about 35%, perhaps far more if the clutches are not in proper adjustment. The change in hub diameter also reduces the space available for tape so much that we have had to decrease the footage from 1250 ft. down to 1200 ft. minimum.

The Result

Needless to say, the change to the new hub diameter would not have been made without good and sufficient reason as far as advantages to the *user* are concerned.

So far, we have discussed only the matter of torque and tension. Now let's consider the effect of these factors on machine performance. The high tape tensions encountered when operating at small effective diameters, on both the take up and supply reels, have been found guilty of introducing undesirable speed changes in the operation of many machines. These speed changes, even though very slight, can be a source of annoyance to the professional recordist, particularly as regards the timing errors which they may introduce. The new reel, by eliminating these areas of excessive tape tension, will help the engineer who is striving for split-second timing of taped program material.

Also, by reducing tape tension, the new reel will lessen the pressure of the tape on the heads, minimizing head wear and consequently contributing somewhat to increased stability of the recording and reproducing characteristics of the machine.

The musician, be he of the professional or domestic variety, will especially appreciate the improved constancy of speed and timing, as this means more constant pitch — a factor to which his trained ear is particularly sensitive.

Audio Devices Offers New Adhesive Reel Labels

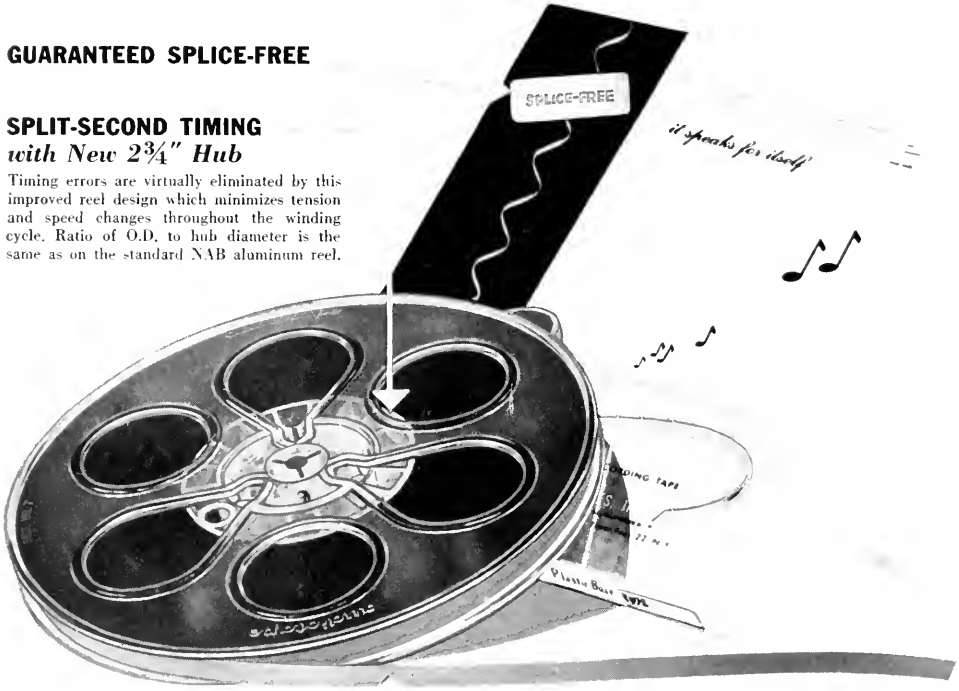
The convenient, press-on adhesive labels, shown above in a handy 30-label package, permit easy and positive identification of recorded tape reels — even when they have been removed from their respective boxes. Each label provides space for title, date and reel number. All you have to do is peel the label off of the paper backing sheet and press it onto the side of the reel. It will adhere firmly as long as desired without curling up at the edges or peeling off.

When you want to remove the old label, you simply lift up one edge and pull it off the reel, leaving the surface clean and entirely free of sticky residue.

These new reel labels are available through your regular Audiotape supplier.

NEW 7″ REELS OF audiotape* give you

at no extra cost!



GUARANTEED SPLICE-FREE

SPLIT-SECOND TIMING *with New 2¾″ Hub*

Timing errors are virtually eliminated by this improved reel design which minimizes tension and speed changes throughout the winding cycle. Ratio of O.D. to hub diameter is the same as on the standard NAB aluminum reel.

PERFECTED ANTI-FRICTION PROCESS. Reduces head wear—eliminates annoying tape "squeal" — prevents "tackiness" even under extreme temperature and humidity conditions.

MAXIMUM UNIFORMITY OF OUTPUT. All 7″ and 10″ reels of plastic-base Audiotape are guaranteed to have an output uniformity *within* ± ¼db — and reel-to-reel-variation of less than ± ½db. What's more, there's an actual *output curve* in every 5-reel package to prove it.

With Audiotape, all of these extra-value features are *standard*. There's no extra cost — no problem of separate inventories or variations in tape quality.

For there's *only one* Audiotape — the finest obtainable anywhere. Test it — compare it — let Audiotape speak for itself.

The new 7-inch plastic reel with large diameter hub for greater timing accuracy is now being supplied on all orders unless otherwise specified. Because of increased hub diameter, maximum reel capacity is slightly over 1200 feet. Older style Audiotape reels with 1¾″ hub and 1250 feet of tape will continue to be furnished on request at the same price.

**Trade Mark*

AUDIO DEVICES, Inc.

444 Madison Ave., New York 22, N. Y.

Export Department, 13 East 40th St., New York 16, N. Y., Cables "ARLAB"

• • •

October, 1952, Vol. 8, No. 7

Published by
AUDIO DEVICES, INC.
444 MADISON AVENUE, N. Y. 22, N. Y.

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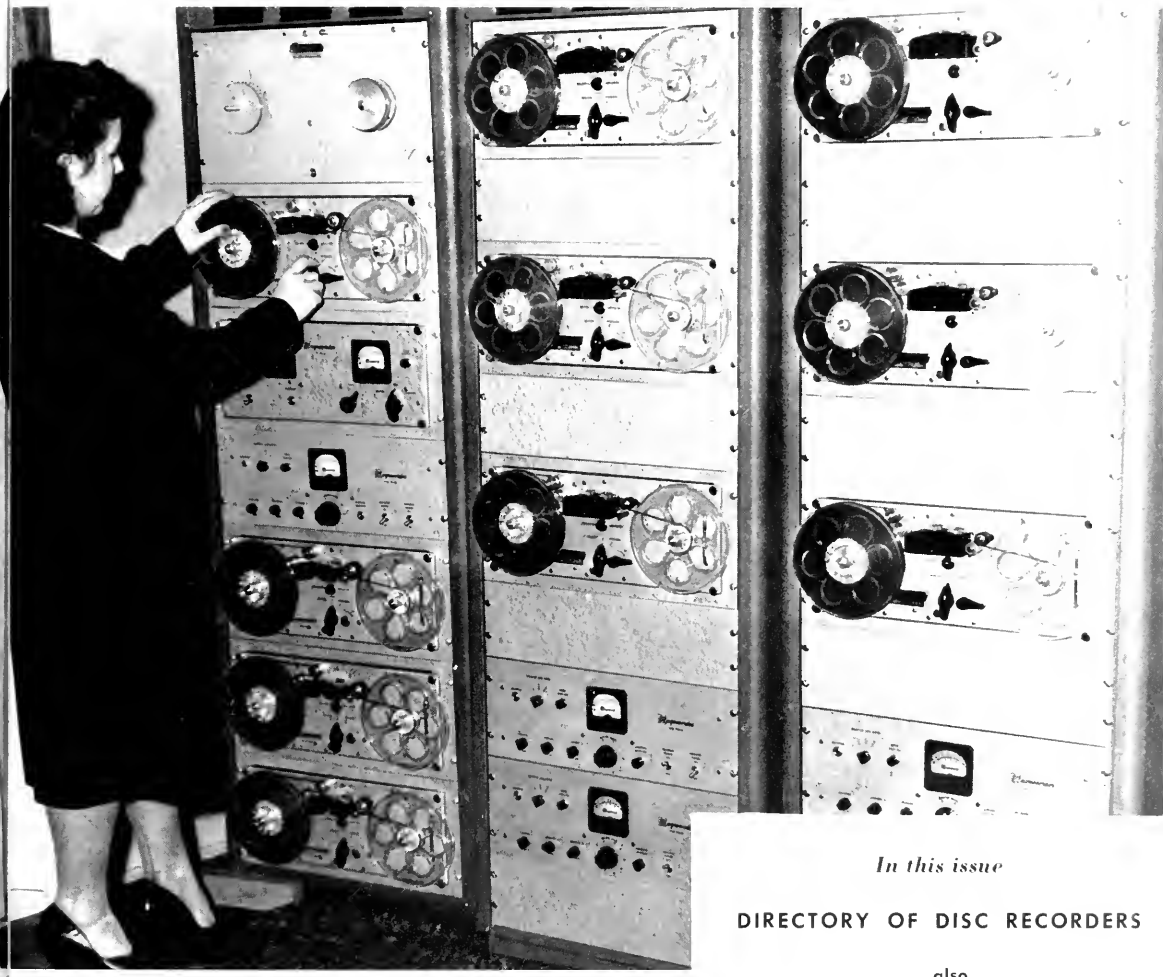


Ten rack-mounted Magnecord tape recorders arranged for full range duplication of pre-recorded "Magnecordings by Vox", now being offered commercially by MaVoTape, Inc. All recordings are made on plastic base Audiotape. Story on Page 3.

In this issue

DIRECTORY OF DISC RECORDERS

. . . also

- Magnetic Sound, Inc.
- Magnecordings by Vox
- Fall Maintenance Drive

MAGNETIC SOUND Perfects Taped Program Service

During the second week of September, the voices of Hollywood star performers on the world-famous "Hour of St. Francis" were broadcast from magnetic sound tape in the studios of some 500 radio stations.

It was a historic week for the tape recording and duplication industries. It was a dream come true for a young Des Moines company which pioneered the mass duplication and distribution of quality tape transcriptions at competitive low prices.

For six years, ever since the program was started, the "Hour of St. Francis" had been recorded and duplicated by older methods. Now, converting to tape, the 15-minute weekly religious drama on 500 stations became America's largest customer for sound tape duplication.

Magnetic Sound, Inc., Des Moines, founded two years ago by three men who had an idea and the experience to back it up, was given the duplication business. They got it because their system met the requirements of low cost, high quality and efficient distribution. The problem of tape cost has been solved by repeated usage, made possible by an easy, low-cost system for stations to return the tapes. The problem of duplicating cost has been solved by a 40-unit machine, said to have the largest capacity in the industry. The problem of distribution has been solved by a streamlined system of shipping reels to stations and having them returned.

By reducing duplication cost on 15-minute shows to as low as 23 cents a copy on orders of sufficient volume, Magnetic Sound has made it possible for the "Hour of St. Francis" and other large users to reduce their transcription budgets, escape the burdensome details of distribution, and gain the much-sought advantages of tape quality.

Magnetic Sound, Inc. was founded by Don Wrigley, whose background included 24 years in sales and business management and precision manufacturing; John T. Beeston, Jr., with 25 years' experience in radio and electronic engineering; and Stuart Steelman, with 15 years in the radio and entertainment fields, specializing in musical production and direction.

Steelman was elected president. Beeston became vice president and technical director. Wrigley was named executive vice-president, placed in charge of active management, and assigned to explore the market for mass-duplicated tapes.

For two months, Wrigley traveled over the nation talking to radio stations, program producers, and such prospective customers as insurance companies, manufacturers, sales organizations, religious and educational institutions, and government information departments. The more people he talked to, the more he became aware of the great need for low-cost bulk duplication of magnetic tape. But he learned, too, why sponsors and program producers had been reluctant to make a change.

Technical Director John T. Beeston, Jr., of Magnetic Sound, Inc., Des Moines, checks the tapes on the company's 40-unit Dupli-Recorder.

"At that time," Wrigley recalls, "everyone felt that the cost of tape duplication was almost prohibitive. Duplication cost almost half as much per copy as the price of the actual tape. Of course, tape could be re-used hundreds of times, but duplicating costs offset the saving on tape."

From radio engineers, Wrigley learned another thing. "They told me the quality of transcriptions on tape was still not as close to perfection as it could and should be."

Back home in Des Moines, Wrigley reported his findings to his associates, Beeston and Steelman. On the solid concrete floor of his basement, Beeston already was designing and building an electronic duplicating machine with 12-reel capacity. To meet the need for a truly low-cost duplicating system, he started over again and built a machine with 40-reel capacity. This, he found, was the maximum for efficient re-recording. Through days and nights of painstaking designing and redesigning, he refined the mechanical operation of the Dupli Recorder.

Now, almost every day's mail brings letters of praise. Radio station executives write that the quality of sound reproduction is "the best we've ever heard". Engineers report "excellent quality" and send penciled notes back to Magnetic Sound with the used tapes.

A streamlined system for packaging, distribution and return of tapes has played an equally important part in the growth of Magnetic Sound, Inc., and its service to sponsors and stations.

Recently, the company produced a 13-week series of 15-minute quiz shows for 23 West Virginia stations. Each week, the sponsor's master tape was received airmail by Magnetic Sound between 6 and 10 p.m. Friday. By 1 a.m. Saturday, the 23 duplicate tapes were on their way back to West Virginia. Stations received them Monday

(*Continued on Page 8, Col. 2*)

audio record
VOL. 8, NO. 7 OCTOBER, 1952

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

audio pointers for the Recordist

By C. J. LeBel, Vice President, Audio Devices, Inc.

FALL MAINTENANCE DRIVE

C. J. LeBel

A cool wind blows across the writer's desk as he reflects on the summer just past. In many parts of the country it was the hottest on record; the growing vigor of the political campaign presages an even "hotter" fall in the recording room.

The fact that many recording rooms are not air-conditioned allowed the weather to work its will, and the idiosyncrasies of daylight saving introduced an additional load factor. Finally, and worst of all, the extensive use of tape has transferred most of the worry from operating personnel to the unfortunate maintenance supervisor. So now looks like a very opportune time for a fall maintenance drive.

Head Wear & Tape Tension

Magnetic heads do wear with use, but this produces no harmful effect up to the point where the air gap begins to increase (disregarding the grooving effect discussed in the Audio Record of February 1952). After the gap begins to increase in width the frequency response deteriorates rapidly. While the gap could be checked with a microscope, we are really interested in performance and so a direct measurement of frequency response is the best answer. On second thought, it might be wise to examine the head and guide surfaces for grooving too.

If you have had to apply excessive tape tension to maintain output stability and high-frequency response, reduce the tension to the value recommended by the machine manufacturer, and check for head or guide misalignment. Increasing tape tension in an attempt to compensate for machine

(*Continued on Page 8, Col. 1*)

"Magnecordings by Vox"

MaVoTape, Inc. Introduces New Line of Full-Range Musical Recordings Magnecorded on Audiotape

With more and more tape recorders finding their way into America's home every day, the demand for a commercial source of high quality tape recorded music has grown to a point which appears to justify a production and distribution setup devoted specifically and solely to this purpose.

After carefully weighing the potentialities of this market, a separate corporation, MaVoTape, Incorporated, has been formed to produce full-range, pre-recorded tapes which will be available at reasonable cost to tape recorder owners throughout the country. Mr. A. Lionel Whyte has been named sales manager of MaVoTape, Inc., 225 West Ohio Street, Chicago, owned jointly by Magnecord and Vox Productions. The tape recordings, under the trade name "Magnecordings by Vox," are being introduced to the public for the first time at the Audio Fair, held in New York City on October 29 - November 1. A limited test distribution of the recordings will be made immediately following their New York introduction.

With the wide range of standard tape recording speeds available, on single or dual track, the pre-recorded tape business faces a situation somewhat similar to that of the phonograph record industry. In order to produce recordings which can be played back on the majority of tape machines now in home use, MaVoTape, Inc. is currently planning to offer all recordings on both single and dual track at $7\frac{1}{2}$ inches per second tape speed.

The "Magnecordings" will be made by Magnecord, for MaVoTape, Inc., from the "master" tapes of the Vox Productions, Inc. and will be distributed initially through Magnecord distributors. All recordings are duplicated with professional Magnecord machines on plastic base Audiotape, assuring the utmost fidelity of the recorded material, with full frequency reproduction from 50 to 15,000 cycles per second.

Plans call for six releases per month. Initial releases will include the following:

Shostakovich—5th Symphony
Jascha Horenstein—Vienna Symphony

Dvorak—5th Symphony
Jascha Horenstein—Vienna Symphony

Mahler—2nd Symphony
Otto Klemperer—Vienna Symphony

Berlioz—Harold in Italy
Rudolf Moralt—Vienna Symphony

Tchaikovsky—Piano Concerto No. 1 in B Flat
Monique de la Bruchollerie—Piano
Rudolf Moralt—Conductor

Chabrier—Espana, Bouree Fantasque, Habanera, Overture to Gwendolyn
Orchestra de la Concerto du Cologne

Mussorgsky—Night on Bald Mountain
Paris Conservatory Orchestra
A. Cluytens

J. S. Bach—Tocata and Fuge in D minor
Prelude and Fuge in D
Anton Heiler—Organ
(First of a series in the complete organ works of Bach)

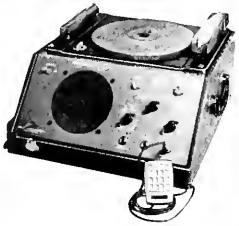
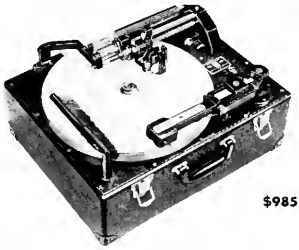
W. A. Mozart—Jupiter Symphony No. 41—Vienna Philharmonic

Vivaldi—Concerto Grossi 1 and 2
Pre-Musica String Orchestra
(First of the series in the complete "L'estro harmonicum")

The high-fidelity enthusiast and music collector will welcome this opportunity of building up an ever increasing tape library of truly fine recorded music performed by Europe's leading artists.

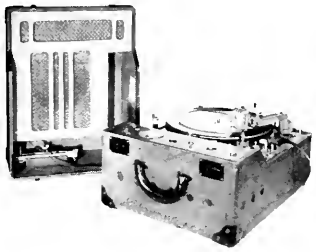
QUICK FACTS ON DISC RECORDERS

(Additional Information can be obtained by writing to the manufacturer)

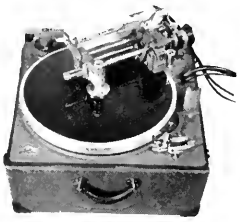
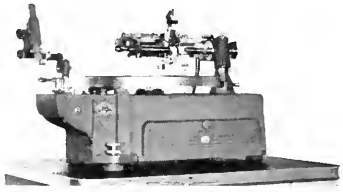
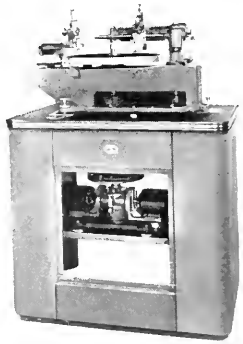
Manufacturer	Model and Price	Data
BELL SOUND SYSTEMS, INC. 555 Marion Rd., Columbus 7, Ohio	 $175.00 Model RC-47A Portable	Portable, dual-speed disc recording and playback unit for general home recording service. Records and plays back discs up to 10" in diameter, at 78 and 33⅓ rpm, or 78 and 45 rpm. Conversion spring supplied for obtaining 45 rpm on 33⅓ rpm position. Cuts 160 lines per inch. Magnetic cutting head and twin tilt crystal phono pickup with dual styli. Inputs for microphone, radio-phone and direct external recording. Sound effects or vocal selections can be dubbed in while recording from radio or re-recording from another disc. Includes visual recording-level indicator, 6" PM speaker and Hi-Z crystal microphone, headphone monitoring jack and output for external speaker. Weight—approximately 40 lbs.
	 $985.00 Model 539-G Portable	Portable, professional-type disc recorder and reproducer with turntable speeds of 78 and 33⅓ rpm. 16" turntable accommodates discs up to 17¼" diameter. Direct synchronous motor drive thru gear and worm for 33⅓ rpm. Ball race step-up for 78 rpm. Speed accuracy, 0.15%. Model 541 Magnetic Cutterhead and Model 542 Lateral Dynamic Pickup provide overall response essentially flat from 30 to 10,000 cycles. Noise level, 44 db below standard recording level of 2.5 in. per second stylus velocity at 1000 cps. Stationary overhead lathe type feed mechanism with adjustable pitch of 96, 112, 120 and 136 lines per inch, cutting in-out and out-in. Full weight of recorder mechanism supported independently of trunk by integrally cast legs of top panel casting. Weight 80 lbs.
FAIRCHILD RECORDING EQUIPMENT CORP. 154th St. and 7th Ave., Whitestone, N. Y.	 $1,395.00 Model 539K Console	Professional, console-type disc recorder and reproducer with turntable speeds of 78 and 33⅓ rpm. 16" turntable accommodates discs up to 17¼" diameter. Direct synchronous motor drive thru gear and worm for 33⅓ rpm. Ball race step-up for 78 rpm. Speed accuracy, 0.15%. Model 541 Magnetic Cutterhead and Model 542 Lateral Dynamic Pickup provide overall response essentially flat from 30 to 10,000 cycles. Noise level, 44 db below standard recording level at 2.5 in. per second stylus velocity at 1000 cps. Stationary overhead lathe type feed mechanism with adjustable pitch of 96, 112, 120 and 136 lines per inch, cutting in-out and out-in. Microscope and light mounted on lathe mechanism for close observation of depth of cut and condition of groove. Manually operated spiralling device is standard equipment.
	 $2,985.00 Model 523 Studio Recorder	Professional console-type disc recorder with provision for microgroove and lip synchronous recording. Planetary driven lead screw provides instant, infinite variation of pitch from 80 to 160 lines per inch, in-out or out-in feed. 16" turntable accommodates discs up to 18" in diameter. Synchronous motor drive direct through worm and gear for 33⅓ rpm. 78 rpm step-up through precision ball race. Driver unit mounted at bottom of cabinet. Absolute timing at 33⅓ speed within limits of power line frequency. Noise level better than 55 db below reference. Model 541 Magnetic Cutterhead holds flat tolerance close to 1 db to 9,000 cycles. Depth and angle of cut adjustable while recording. Feed mechanism includes time scales for all standard NAB pitches. Includes swivel mounted microscope with light, manually operated spiralling device, and attachment for suction device. Weight—approx. 275 lbs.

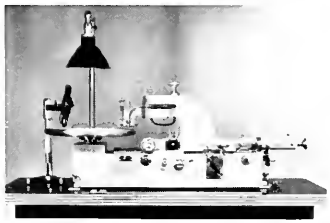
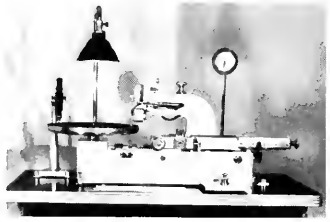
(Continued on next page)

NOTE: All prices listed are subject to change without notice. Consult manufacturer or local dealer for exact price, as some prices are list and others net.

Manufacturer	Model and Price	Data
FAIRCHILD RECORDING EQUIPMENT CORP. **154th St. and 7th Ave., Whitestone, N. Y.**	 **Model 541 Magnetic Cutterhead** **$160.00**	Standard equipment on current Fairchild disc recorders. Also adaptable for installation on earlier Fairchild models, or on other makes of professional machines. Frequency response, + 2 db, 30 to 10,000 cycles. Distortion, less than 1% at 400 cycles. Impedence, 500 ohms. Audio power required, 0.6 watt (+ 20 db).
	THERMO-STYLUS KITS **Model 300 (for Fairchild 541 head) $100.00** **Model 301 (for RCA M1-11850-C) 115.00** **Model 302 (for Presto 1-C and 1-D) 115.00**	Adapts Fairchild, RCA or Presto cutterheads for hot stylus record ing. Kit includes an adapter receptable, two special styli with built in miniature heating elements (one fine pitch and one std. pitch) and a thermo control box containing all necessary current and temperature indicating and control facilities.
THE GENERAL INDUSTRIES COMPANY **Elyria, Ohio**	 **Home Disc Recording Chassis** **Model G1-R58L-LP $53.50** **Model G1-R90L-Std. 49.50**	Home disc recording and reproducing chassis with dual speed turntable for cutting discs up to 10″ diameter and playing records up to 12″ diameter. Rim drive, 4-pole motor. Compensating switch operated by speed change dial. Model G1-R90L operates at 78 and 33⅓ rpm—cuts 120 lines per inch. Model G1-R85L operates at 78 and 33⅓ rpm, with conversion spring for changing 33⅓ speed to 45 rpm. It cuts 160 lines per inch and includes dual purpose pickup for playing either standard or microgroove records. Weight approx. 15 lbs.
	 **Tape-Disc Recording Chassis** **Model 250 $79.50**	Combined disc and tape recording and reproducing chassis with 78 rpm rim-drive turntable for recording and playback of discs up to 10″ diameter. Dual track tape recorder operates at 3¾ inches per second. Records from disc to tape or vice versa—and from microphone or radio to disc or tape. Cutting stylus and playback needle easy to interchange. Weight—10½ lbs.
PRESTO RECORDING CORPORATION **P.O. Box 500, Hackensack, N. J.**	 **Model K Portable Recorder** **$348.00**	Portable, semi-professional disc recorder and reproducer, including amplifier and loudspeaker. Provides dual speed operation at 33⅓ and 78 rpm (45 rpm optional at extra cost). Takes discs up to 13¼″ diameter—records both standard and microgroove. Feed mechanism cuts 112 and 224 lines per inch, inside-out or outside-in. Overall response within 2 db from 50 to 8000 cycles. Total noise level, 25-30 db below maximum useful reproduced sound level. Speed accuracy within 0.5%. Includes magnetic cutting head, two pickups, and five-stage recording amplifier. Controls include volume indicator meter, combined equalizer and tone control, dual volume control and selector switch for recording, playback and PA opera tion. Weight—46 lbs.
	 **Model Y Portable Recorder** **$771.00**	Portable, professional type 16″ disc recording and reproducing equipment, with 10 watt amplifier and detachable 10″ speaker. Records all sizes of discs by either standard or microgroove method. Turntable speeds, 33⅓ and 78 rpm (45 rpm optional at extra cost). Cutting pitch, 112 and 224 lines per inch, inside-out and outside-in. Presto 1 D cutting head supplied. Overall response flat within 2 db from 50 to 10,000 cycles. Can be modified with equalizer control. Total noise level, over 35 db below maximum useful reproduced sound level. Speed accuracy, within 0.5% at 33⅓, 45 and 78 rpm. Amplifier panel includes VU meter, 2 mike input gain controls, playback gain control, treble and bass equalizer controls, and selec tor switch for recording, playback and PA operation. Weight—57 lbs.

(Continued on next page)

Manufacturer	Model and Price	Data
PRESTO RECORDING CORPORATION P.O. Box 500, Hackensack, N. J.	 Chassis $690.00 In Case (as shown) $735.00 **Model 6-N Portable Recorder**	Portable, professional type disc recorder and reproducer with 78 and 33⅓ rpm turntable and standard cutting pitch of 112 lines per inch inside out. Feedscrews for 96, 104, 120 or 136 lines per inch, inside-out or outside-in can be substituted if desired. Can also be supplied equipped for microgroove recording (244, 256 or 288 lines per inch) at additional cost. 116-N overhead cutting mechanism includes 1-D cutting head, 15-B spiraling feedscrew, 170-A vertical damper and 20-A time scale. Frequency response, 50-10,000 cycles. Noise level, 40 db below maximum useful reproduced sound level. Speed accuracy, within 0.5% at 78 and 33⅓ rpm. Available as chassis, in carrying case (as illustrated) or in a cabinet. Weight of portable unit—82 lbs. Amplifiers not included.
	 **Model 8-D Studio Recorder** **$1,992.00 (less cabinet)**	Professional type disc recorder with 33⅓ and 78.26 rpm rim drive. Available for table mounting (as illustrated) or with console type cabinet shown below at extra cost. Accommodates all instantaneous and master disc sizes. Equipped with 1-D cutter, 160-A or 161-A automatic equalizer and 125-A microscope. Frequency response, 50-10,000 cycles. Noise level, better than 40 db below program level. Speed accuracy, within 0.5% at both 33⅓ and 78.26 rpm. Pitch adjustable for 88, 96, 104, 112, 120, 128 and 136 lines per inch, inside-out or outside-in. Microgroove optional at extra cost. Cantilever type overhead feed mechanism does not contact disc or turntable. Motor and driving idlers mounted in cast iron base with built in leveling screws.
	 **Model 8-DG Studio Recorder** **$2,644.00 (with cabinet)**	Professional type disc recorder with 33⅓ and 78.26 rpm direct gear drive. Includes console type cabinet containing twin motor drive equipment. Accommodates all instantaneous and master disc sizes. Equipped with 1-D cutter, 160-A or 161-A automatic equalizer and 125-A microscope. Frequency response, 50-10,000 cycles. Noise level, better than 50 db below program level. Speed accuracy, no deviation from 33⅓ and 78.26 rpm. Pitch adjustable for 88, 96, 104, 112, 120, 128 and 136 lines per inch, inside-out or outside-in. Microgroove optional at extra cost. Cantilever type overhead feed mechanism does not contact disc or turntable. Recorder unit mounted on top of cabinet with built-in leveling screws.
REK-O-KUT COMPANY 38-01 Queens Boulevard, Long Island City 1, N. Y. (Continued on next page)	 **Challenger Deluxe 13¼" Disc Recorder** **$439.95**	Portable, semi professional disc recording and reproducing equipment with built-in amplifier and speaker. Synchronous motor rim drive. Finger-tip speed control for selection of 78 or 33⅓ rpm. Idler and adapter for 45 rpm interchangeable with 33⅓ rpm idler. Overhead recording mechanism with "Liftomatic" safety cam and provision for manual spiralling. Records from 6" to 13¼" masters. Dual stylus pickup plays up to 16" transcriptions, standard or microgroove. Frequency response, 40-7,000 cycles. Leadscrews available for 108, 120, 144 or 192 lines per inch, inside-out or outside-in. R-8A 13.5 watt amplifier includes VU meter, bass and treble equalizers, four input channels, output selector and three-position monitor switch. Weight—65 lbs.

Manufacturer	Model and Price	Data
REK-O-KUT COMPANY **38-01 Queens Boulevard,** **Long Island City 1, N. Y.**	 **12" Recording Chassis** **TR-12H Turntable $129.95** **M-12 Cutting Mechanism 99.95**	TR-12H dual-speed 12" recording turntable provides instant speed shift for 78 or 33⅓ rpm. 45 rpm idler available for interchange with 33⅓ rpm. Synchronous motor rim drive. Weight, 17 lbs. M-12 overhead recording mechanism records up to 13¼" master discs, at 108 lines per inch. Extra leadscrews available for 120, 144 or 192 lines per inch, inside-out or outside-in. Includes manual spiralling control and "Liftomatic" safety cam which automatically lifts cutter at end of leadscrew. Magnetic cutter, response flat from 40 to 7,000 cycles.
	 **16" Recording Chassis** **V-Deluxe Turntable $215.00** **M-55 Cutting Mechanism 215.00**	V-Deluxe 16" recording turntable provides instant self-locking speed shift for 78 or 33⅓ rpm. 45 rpm idler available for interchange with 33⅓ rpm. Synchronous motor rim drive. Weight—28 lbs. M-55 Master-Pro 16" overhead recording mechanism includes tilt and level adjustment, dual clutch spiralling control, micrometer depth and angle adjustments, and leadscrew for 120 lines per inch outside-in. Extra leadscrews available for 105, 135 or 210 lines per inch, inside-out or outside-in. Weight—11 lbs.
SCULLY MACHINE COMPANY **62 Walter St., Bridgeport 8, Conn.**	 **Scully Standard Disc Recorder** **$4,620.00**	Professional disc lathe designed to meet the most exacting requirements for cutting broadcast transcriptions and phonograph record masters. Accommodates all standard disc sizes. Three speeds available—78, 45 and 33⅓ rpm. Fourteen changes of feed—88 to 350 lines per inch. Machine driven coarse lead-in, spacing and tail-out grooves. Signal to noise ratio, 50 db below mean program level. Includes microscope, overhead illuminating lamp, provision for pneumatic chip removal and flat top cabinet containing precision, constant speed drive equipment. Lathe provided with micrometer adjustments for depth and angle of cut and leveling of table. Cutterhead not supplied.
	 **Scully Automatic Disc Recorder** **$5,895.00**	Fully automatic, push-button operated professional disc lathe designed to meet the most exacting requirements for cutting broadcast transcriptions and phonograph record masters. Accommodates all standard disc sizes. Three speeds available—78, 45 and 33⅓ rpm. Pitch continuously variable from 70 to 350 lines per inch. Automatic lead-in spacing and tail-cut grooves. Completely automatic ending line for 45 rpm records. Signal to noise ratio, 50 db below mean program level. Includes microscope, overhead illuminating lamp, timing clock with sweep second hand, provision for pneumatic chip removal and flat top cabinet containing precision, constant-speed drive and automatic control equipment. Lathe provided with micrometer adjustments for depth and angle of cut and leveling of table. Cutterhead not supplied.
WILCOX-GAY CORP. **385 4th Ave., New York 10, N. Y.**	 **"Tape-Disc Recordio"** **Model 3C10** **$199.95**	Portable home-type combination disc and tape recording and reproducing unit with built-in amplifier and speaker. 78 rpm rim-drive turntable records and plays back discs up to 10" diameter. Cutting stylus and reproducing needle easily interchanged. Dual-track tape recorder operates at 3¾ inches per second. Fast forward and rewind speeds. Frequency response, 80-6,000 cycles ± 3 db. Records from tape to disc or vice versa and from microphone or radio to disc or tape. Two neon recording level indicators. External speaker jack. Includes microphone and 6" x 9" PM speaker. Weight—30 lbs.

FALL MAINTENANCE DRIVE

(*Continued from Page 3, Col. 1*)

faults is a very unwise thing. Modern tapes are rugged and can stand abuse, but it is possible to misadjust a machine so that the strength of even the best tape is exceeded. At the same time the tape is abused, head and guide wear become excessively rapid. It is much better to find out what is really wrong and to cure it.

Adjustable friction clutches may change their adjustment with use, so that machine tensions may be greater or lesser than the proper value. The latter condition will lead to fluctuating output, particularly at the higher frequencies. Usually, the manufacturer's recommendation should be followed when readjusting tension.

Electrical Components

By now the equipment has probably been in use for at least a year or two, and design errors have begun to show up. Are any of the resistors too heavily loaded? How about the "½ watt" resistor that is actually dissipating .500 watts? In the confined spaces of a typical amplifier this is really an overload, and noise and breakdown are likely to follow eventually. How about the "2 watt" resistor that is equivalently loaded—perhaps replacing it by a wire-wound power resistor would be desirable. Any of the low-level resistors may have become noisy, and replacing them by deposited-film or wire-wound units might be appropriate.

Commercial condensers do not always last forever. Coupling condensers may have become leaky, raising the noise level. When machines are rack-mounted close together, condensers may run at high temperature. Low capacity or high leakage will result, causing an increase in amplifier noise level.

Some recorders have used switches that would not stand up under the steady use of a radio station. At times a change in contact material is sufficient; in other cases, a completely new switch assembly will be needed to effect a permanent cure. If you have suffered from erratic operation, now is the time to do something about it.

Finally, some machines were shipped with electromagnets which were loaded too heavily, or which had barely adequate force for the application. By this time, the manufacturer has developed a more conservatively designed replacement.

Conclusion

Preventive maintenance has always been necessary in the recording room, so we are on very sound ground when we suggest anticipating problems before they cause the loss of a program.

MAGNETIC SOUND, Inc.

(*Continued from Page 2, Col. 3*)

or early Tuesday. Within the same week, used tapes were coming back to Magnetic Sound for erasing and re-recording.

This kind of service, now being performed for the "Hour of St. Francis" on a 500-reel scale and other sponsors on a lesser scale, is made possible by a system that speeds up mailing to stations and saves the stations time and money in returning tapes.

The sponsor simply sends Magnetic Sound a master tape, mailing list and brief program notes. Magnetic Sound makes the necessary number of duplications—up to 40 at a time. Tape reels have a special identification so the stations can easily recognize them and keep them apart from their own tapes.

On Magnetic Sound's production line, each tape is marked with code numbers and placed in a reel box along with program notes. Then it is packed in a strong but lightweight shipping container, addressed to the station, stamped and mailed.

But the shipping container is no ordinary cardboard box. It's a self-addressed reversible carton. On the outside, a sticker addressed to the station is attached. On the inside, the name and address of Magnetic Sound, Inc., are printed. Enclosed inside are strips of sealing tape.

To return the sound tape, the radio station merely folds the carton "inside out" so the Magnetic Sound address is on the outside. Because of the light weight, the postage is only 8 cents. And because Des Moines is centrally located, transit time is reduced to the minimum.

The "Hour of St. Francis", produced by the Third Order of St. Francis under the direction of Father Kenneth Henriques, O.F.M., and starring motion picture talent in religious dramas, is the largest and latest of a steadily growing number of clients served by Magnetic Sound, Inc.

Besides duplicating radio shows for organizations, colleges, government departments and commercial sponsors, the company handles sales and service training programs for industrial firms and recordings of organization conferences.

In the early months, the physical plant of Magnetic Sound was a basement space in Beeston's home. A year ago, the company opened a downtown office. Volume continued to increase, and three months ago the offices, production and shipping facilities were combined at a new location with 2,400 square feet of floor space—occupying the entire second floor of a business building at 4805 Grand Avenue, Des Moines.

Although the company's 40-reel Dupli-Recorder can turn out as many as 5,000 duplications of 15-minute programs in a 40-hour week, Wrigley reports that increasing commitments and requests will require more machines. Plans for two more units are already on the drawing board.

"And," he adds, "as production increases, we plan to make a further reduction in charges for our services."

In a corner of the shipping department of Magnetic Sound, Inc., sound tapes are boxed and labeled for mailing to radio stations throughout the nation.

Nov.-Dec., 1952. Vol. 8, No. 8

Published by
AUDIO DEVICES, INC.
444 MADISON AVENUE, N. Y. 22, N. Y.

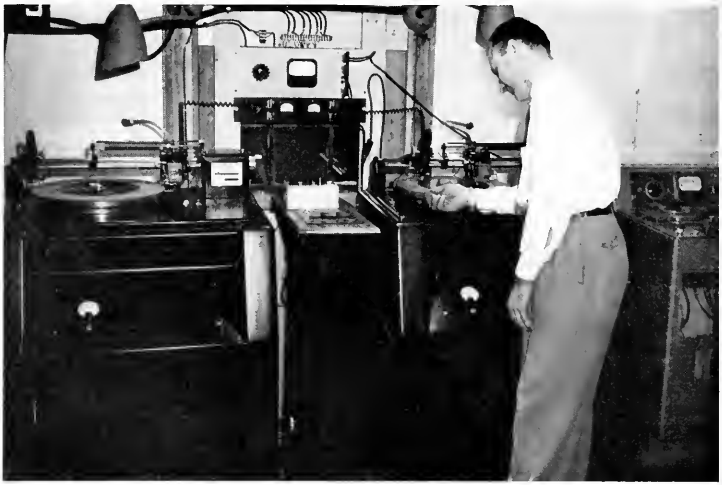
audiodiscs
audiotape
audiofilm
audiopoints

Fine sound in the making, by Fine Sound, Inc. George Piros (left) tends the Margin Control while cutting a long playing master, as Bob Fine (right) adjusts the recording level. Equipment shown includes a Fairchild tape recorder and Fairchild Model 523 Disc Recorder with Miller cutterhead specially made to Fine Sound specifications. Story on Page 2.

In this issue

The Inside Story of FINE SOUND, Inc.

by Leon A. Wortman



Engineer George Piros, of Fine Sound Inc., keeps one eye on the stopwatch, while cutting a 78 rpm playback to check recording quality. Equipment shown includes two Fairchild disc recorders and Ampex tape recorder.

Literature and history may have their "Horatio Alger" to boast about, but the recording industry and Tomkins Cove have their "Fine Sound, Inc." Tomkins Cove is a historic small town (pop. 1500) 40 miles up the west bank of the Hudson River from Manhattan, and that's where Fine Sound, Inc. is located. "Fine" isn't a play on words or a bad pun. It's the name of the company's president, C. Robert Fine, one of the best known and most ingenious engineers in this field of recording.

Skipping a few periods of chronology and the details of the years spent as a lad shaving wax masters, inspecting styli, learning how to service and adjust equipment and make masters for a living, "Bob" Fine's career has carried him through positions as Chief Engineer of Majestic Records, and Chief Engineer of the Disc and Tape Recording Divisions of Reeves Sound Studios. In March of this year he fulfilled a normal American ambition for independence by establishing Fine Sound, Inc.

Bob's ingenuity is responsible for so many of the modern recording techniques that equipment manufacturers, inventors and recording engineers often seek his advice and opinions on new products and ideas. He developed and made practicable such techniques of recording as varying the pitch and depth of cut while actually making a lacquer master. This technique, called Margin Control, enables a fantastic and true dynamic range of audio to be actually put on the disc. In effect, Margin Control physically spreads the music grooves on forte passages to avoid over cutting and making a reduction in loudness unnecessary. Years of practice and developmental efforts with this technique enabled Bob to overcome the electro-mechanical difficulties of such an "apparently simple" answer to the problems of recording full dynamic ranges and to teach this trick-of-the-trade to his engineers George Piros and Steve Robb. In gratitude and tribute, his clients voluntarily imprint the legend "FINE MARGIN CONTROL" on their record labels and sleeves.

Fine Sound's staff is also credited by many to have made the extended 45 rpm discs long before the industry talked about making them generally available. For a number of years they've been making long-playing 78's for a client who, based on the volume of repeat orders he gives to Fine Sound, must be finding that they have a profitable market.

Years ago Bob produced a 7" diameter 78 rpm disc that gave the equivalent of a 10" disc's playing time. The record industry has only now realized its commercial values and several of Fine Sound's clients find themselves in the fortunate position of being able to swing-over to what may be a new standard any time they give the instruction.

Bob and his crew are a resourceful group. They believe that man *has* harnessed the electron and the machine and they proceed to put both efficiently to work for them when the heavy pressure is on. For example, when the 7" 45-rpm disc was first introduced and the race was on among the record companies to re-release their catalogs of popular selections in the new size and speed, Bob's clients were able to convert and get into the new competition so quickly that the whole industry did a "double-take" and buzzed with admiration. What they'd done, with the cooperation of the Fairchild Recording Equipment Corporation's engineering department, was to develop a device which, attached to a group of Fairchild Disc Recorders, made them operate completely automatically — lowering the cutter to the disc, spiralling in, cutting the music grooves, spiralling out to the start of the eccentric, lifting the cutter and stopping the turntable — all automatically; only one man to load and unload the disc recorders.

We could go on and on about the things the Fine Sound gang has done, but they find the future and the things yet undone more exciting to talk about. They are all excited, for instance, about their latest project (which should be receiving public notices about the time of this article's appearance) with the New York opening of the new Broadway drama "See The Jaguar". Fine did the extraordinary music and sound effects which are used intermittently throughout the play. The "sound", for want of a more precise description of what comes out of the multiple loudspeakers, travels around the walls, ceiling and curtain of the Cort Theatre where the play is scheduled. It actually seems to whirl around, faster and faster, stop suddenly, reverse its direction, disappears into the side wall and suddenly reappears from the roof. Those that have heard it claim it's incredible! It's all done electronically and automatically. Originally planned for release with another special project due in late 1953, they couldn't resist the temptation of introducing it in 1952, when the producers of "See The Jaguar" called on them to do what they thought would be conventional sound effects recording. You'll

(*Continued on Page 3, Col. 1*)

audio record
VOL. 8, NO. 8 NOV.-DEC., 1952

Published monthly by Audio Devices, Inc., 444 Madison Avenue, New York City, in the interests of better sound recording. Mailed without cost to radio stations, recording studios, motion picture studios, colleges, vocational schools and recording enthusiasts throughout the United States and Canada.

Fine Sound

(*Continued from Page 2, Col. 3*)

have fun trying to figure out how they achieved the effects after you hear them.

The Company's own specially built mobile-location truck, fitted with synchronous magnetic tape recorders, complete mixing equipment, 16-mm motion picture cameras and its own 10-kw power generator is kept busy to a degree which is about 200% more than the anticipated load. Each year the truck and a crew headed by Bob Fine spend about 10 weeks travelling Europe doing documentary film work and original sound recording on assignment for a humanitarian foundation and a major recording company. The rest of the year the truck travels the circuit of New York, Rochester, Chicago, Minneapolis, Detroit and other major cities. There Fine Sound does original recordings of soloists, chamber groups, and symphony orchestras for the famous Olympian Classics series of the Mercury Record Corporation. The Olympian series is recorderd under the administrative direction of David Hall, Director of Mercury Classics. Incidentally, Audiodiscs are used exclusively for the lacquer master recording of the Olympian series.

After less than a year of operation, the Company is probably one of the healthiest in the industry, doing a far larger volume of business than was anticipated and expanding into new fields at least a full year ahead of schedule.

The NEW LOOK in Audiotape Packaging

Here's what the well dressed Audiotape will wear when on display in wholesale and retail stores. This five-reel package is designed for easy conversion to an attractive counter display, simply by folding the top cover on a scored center line and tucking the front flap behind the tape boxes in the package. One of these new counter display packages is now included at no extra cost in every carton of 10 or 30 reels of plastic base Audiotape in the popular 7-inch and 5-inch reel sizes.

Porpoise Palaver Put on Tape

More Than 20 Distinct Under-water Porpoise Sounds Have Been Recorded at Florida's Famed Marine Studios

"There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy." In this famous quotation, Shakespeare might well have included "under the sea". For here, in the mysterious realm of marine life, are wonders concerning which the knowledge of man is very limited. But even now, the veil is being lifted — through patient and painstaking scientific research.

In the study of under-water sounds, for example, very interesting progress is being made at the Marine Studios in Marineland, Florida. This huge oceanarium — a mecca for tourists from all over the world — is ideally suited to such examinations. Its two great tanks are populated with an impressive variety of deep sea denizens, under conditions closely approaching their natural environment. And the 200 glass portholes, located at various levels, give an excellent view of every portion of the interior.

One of the biggest attractions at the Marine Studios is "Flippy" the porpoise, whose playful antics and seeming intelligence are a continual source of amazement to visitors. The porpoise, of course, is not really a fish at all — but a mammal. It has no vocal cords. Yet experiments have proved beyond a doubt that the porpoise actually can emit audible sounds. Tape recordings of these sounds, picked up by a hydrophone, or under-water microphone, provide valuable material for study by experts in undersea life.

Mr. F. G. Wood, Jr., Marine Studios curator, explains this recording work as follows:

follows:

Equipment used for the under-water recording includes a U. S. Navy Projector Type CFF-78187 (which is capable of both pickup and transmission under water), an amplifier, speaker or headphones, and an Eicor tape recorder.

"Flippy", the loquacious porpoise, flips skyward to snatch a fish from the attendant's hand, at Marine Studios, Marineland, Florida.

Mr. F. G. Wood, Jr., curator of Marine Studios, makes an under-water tape recording from one of the lower level observation stations. The hydrophone, suspended inside the tank, can be seen through the window.

The investigations are primarily concerned with sounds audible to the human ear and their significance with regard to the activity or behavior of the porpoises. The two species so far recorded include the bottle-nosed porpoise or dolphin and the spotted or long-snouted porpoise.

The sounds which they have thus far produced include whistles, barks, yelps, chirps, snorts and mewing and rasping noises. Twenty distinct varieties of these sounds have been recorded. Their exact significance is not yet understood, although some of the sounds appear to be correlated with emotional states such as fear or excitement. A baby porpoise separated from its mother, emits constant high-pitched whistles. The mother reacts to these whistles and may locate her offspring by means of them.

Some of the sounds — such as whistles — can be clearly heard above the surface of the water. Others are audible only through Hydrophone. Previous studies made by visiting scientists at Marine Studios have revealed that porpoises can hear sounds well above the range of human hearing, and it appears likely that they may be capable of producing such sounds, although there is as yet no reliable data to substantiate this.

This sound recording technique opens up an entirely new field of marine research — one which may eventually give us a much better understanding of life under the sea.

Station WQXR Conducts Historic Three-Dimensional Broadcast

One of the many important conclusions reached by those who attended the Audio Fair held at the Hotel New Yorker on Oct. 28 - Nov. 1, was that binaural sound is here to stay.

In theory, binaural sound is not new. But it is only recently that standard equipment has been made commercially available for binaural recording and reproduction.

The effect of binaural sound on the ears has been compared to that received by the eye viewing stereoptican photographs. Ordinary broadcasting and recording methods are like ordinary photographs — the scene is captured, but the space relationship, the feeling of presence, the "third dimension" is lacking.

With binaural hearing, the music or speech is received as it originates. The person on the left is heard on the left. Those in the rear are heard in the rear. The progress of a person moving across the stage can be followed. It is possible to focus on a single instrument or voice.

Binaural sound in all its startling realism was much in evidence at the Audio Fair. In the Magnecord exhibit room, for example, the new Binaural Magnecorder was convincingly demonstrated with properly spaced loudspeakers as well as with binaural headphones.

When either of the two channels was switched off, the music suddenly fell "flat" by comparison — then miraculously came alive again when both channels were switched on.

Here's a portion of one of the enthusiastic crowds that jammed the main ballroom of the Hotel New Yorker for the Magnecord binaural sound demonstration during the Audio Fair in New York.

In tape recorded binaural sound, one "track" of the tape is used for each channel. Thus program material picked up from the left hand microphone is separately reproduced through the left hand speaker, and the right hand speaker plays back exactly what was "heard" by the right hand microphone.

Of special interest to both recording and radio engineers, however, were the binaural broadcasts aired over Radio Station WQXR and WQXR-FM in conjunction with Magnecord and the Audio Fair. This marked the first binaural radio broadcast utilizing FM and AM for the separate "right hand" and "left hand" channels.

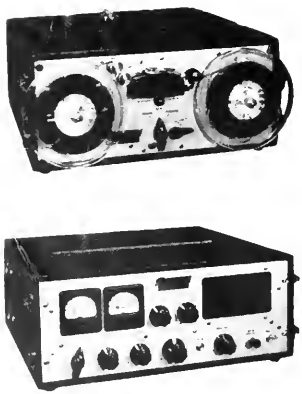
In ordinary broadcasting, when both FM and AM stations are airing the same program, the sound is picked up in the studio from a number of microphones and blended in the control room. The same blended sound is then sent to the AM and FM transmitters for airing. The radio wave is picked up in the home on either AM or FM and heard through a single amplifier and speaker, like hearing with one ear.

In this binaural transmission, the sound was picked up by two microphones placed a short space apart. The signal from one microphone was fed through the control room to the AM transmitter, the other to the FM transmitter. There was no blending and the signals were kept separate. To receive the binaural effect in the home, the listener required only an AM radio and an FM radio — both tuned to station WQXR, and placed at oposite sides of the room. Fred Grunefeld, producer of WQXR's "Music Magazine" instructed the radio audience in the proper adjustment of its AM and FM receivers to obtain the binaural "two-ear" listening effect.

Arrangements for the exclusive WQXR demonstration were made by James E. Kovach, WQXR Station Manager, with the Audio Engineering Society's Executive Vice President F. Sumner Hall, Harold T. Sherman of the Society, and Richard S. McQueen, advertising manager of Magnecord, Inc.

Two binaural broadcasts were transmitted — one on Oct. 29 and the other on Oct. 30, at 9:05 P.M. The first broadcast featured binaural music Magnecorded on Audiotape; the second featured a live orchestra under the direction of Jascha Zayde and the WQXR String Quartet. A press preview was held at 5:30 P.M. preceding the first broadcast on Oct. 29, in the Grand Ballroom of the Hotel New Yorker. Later the Ballroom was opened to the public to hear the binaural broadcast. McIntosh Amplifier and Electro-Voice Speaker manufacturers shared with Magnecord in the Ballroom presentations.

(*Continued on Page 5, Col. 1*)



Magnecord Model PT6-BAH binaural recorder and Model PT6-BN binaural amplifier, used during the Audio Fair demonstrations and for the historic WQXR binaural broadcast. Equipment includes separate input and output channels for each of the two sound "tracks".

Binaural Broadcast

(*Continued from Page 4, Col. 3*)

After the completion of these historic binaural broadcasts, comments from listeners started pouring in to Station WQXR's booth at the Fair. Generally speaking, everyone was thoroughly delighted, pleased, surprised and excited over the whole thing. There were a few exceptions of course. Trouble, where encountered, was due mostly to fading or interference on the AM channel or poor quality of the AM receiver used. Here are a few typical listener comments:

ROCKVILLE CENTRE, N. Y.: "Binaural sound is the greatest thing since FM came on the scene — it's just too bad we can't get the fidelity of two FM sets. Please keep up the experiments — we would like it to become a permanent thing."

BROOKLYN, N. Y.: "I sincerely hope you continue these programs and in time convert entirely to Binaural Sound. It has created more excitement among us music-lovers at Pratt Institute than 'Cinerama'."

BRONX, N. Y.: "I listened to your experiment in Binaural Broadcasting with both amazement and satisfaction. While I presume its commercial possibilities are off in the distant future, it certainly was a notable experiment."

TEANECK, N. J.: "As a regular listener to WQXR, I want to extend my congratulations and applause to your binaural sound experiment last week. I found it a musical experiment that I can only describe as thrilling and exciting."

BROOKLYN, N. Y.: "We found it most interesting and pleasant to close our eyes and envision violinists and cellists clinging to our curtains and playing, fine singers perched on our bureau, and Mr. Zayde himself holding forth upon our bed. Notwithstanding an AM set which is not too selective in the number of stations it plays at one time, this was one of our most enjoyable listening experiences."

BRONX, N. Y.: "I want to express my appreciation of your binaural broadcasts. I have never experienced such depth and direction of sound as during these programs. The music and voice actually seemed to originate in my living room."

These binaural broadcasts, in addition to marking another milestone in radio transmission, went a long way toward selling the music-loving public (at least in the listening area) on the advantage of binaural "two-eared" sound. We believe that it is here to stay.

Worn-out Recording and Playback Styli Now Resharpened and Returned in 5 Days

Here's good news for economy-minded disc recordists.

Audio Devices' resharpening service — which has been available ever since the Audiopoint line was introduced about 15 years ago — has now been streamlined and simplified so that points can be processed and returned more quickly than ever before. And improved packaging facilities give extra convenience and saftey in handling and mailing the points to be resharpened.

This accelerated service will make the economies of stylus resharpening particularly attractive to all users of disc recording equipment. A resharpened stylus is, in every respect, the equal of a brand new one. It is ground and polished on the same precision machines, by the same skilled craftsmen, and to the same precise standards of dimensional perfection. Yet the resharpening cost is less than *half* the original stylus cost.

Here, for example, are the current list prices for Sapphire and Stellite Audiopoints, together with the resharpening costs.

TYPE	LIST PRICE	
Recording Audiopoints	New Point	Per Resharpening
Sapphire No. 14 (87°)	$7.25	$3.25
Sapphire No. 14 (70°)	7.25	3.75
Sapphire No. 202	5.25	2.60
Stellite No. 34	1.75	.85
Playback Audiopoints		
Sapphire No. 113	6.50	2.25
Sapphire No. 103	2.00	1.00
Sapphire No. 303	2.00	1.00

If a Sapphire No. 14 (87°) is resharpened five times, total cost of original stylus plus five resharpenings amounts to $24.75 List. In comparison, six new points which would be required for doing the same amount of recording work would amount to $43.50 List. In this case, resharpening saves a total of $20.00, reducing the average cost per stylus from $7.25 to $3.92 List.

To help you get the most out of this cost-saving service, here are some helpful pointers on stylus resharpening.

Why Resharpen

The condition of the stylus is one of the most important factors in achieving perfect disc recording and reproduction. A worn or damaged recording stylus will produce an unsatisfactory cut. And a worn or chipped reproducing point will impair playback quality and can cause irreparable damage to the recorded disc.

These handy mailing cards and envelopes simplify the return of recording and playback styli for fast resharpening. Cards hold 4, 8 or 16 points.

When to Resharpen

Visual inspection through a good magnifier will reveal a chipped or damaged stylus, which, of course, should be replaced immediately. But a worn or dulled stylus can only be detected by its *performance*. Surface noise or scratch is a pretty sure sign that the cutting stylus should be replaced or resharpened. The shininess or light-reflecting ability of the groove walls is a direct index of the quietness of cut. The desired degree of shininess can be gauged by comparison with a new and unplayed commercial phonograph record. A playback point which does not track properly, gives poor tone quality, or causes rapid wear of the disc is very likely to need replacement or resharpening. Also, excessive wear in a playback point can usually be observed under magnification, in the form of flattening or deformation of the extreme tip.

Number of Resharpenings

If properly handled and subject only to normal wear, first quality dural-shank Audiopoints can be resharpened as many as ten times. If, however, the sapphire is chipped or broken, considerably more of the point must be ground away in the resharpening process and the maximum number of resharpenings will be reduced accordingly.

End of Resharpening Life

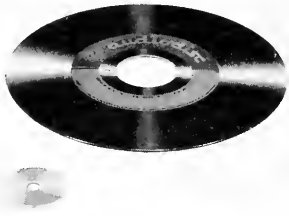
To determine when a point can no longer be resharpened, examine it under a 20 power glass. If it is found that a considerable portion of the metal shank on the back (opposite the cutting face) has been ground away at the last resharpening, the point should not be returned again for further resharpening.

(*Continued on Page 6, Col. 3*)

NEW 7" Audiodiscs for 45 rpm

Left: 7" Audiodisc as used for recording, with brass center-hole adapter in place.

Below: 7" Audiodisc ready for playback, with brass center-hole adapter removed and shown separately in foreground.



These new 7-inch Red Label Audiodiscs have been specially designed for recordists who wish to make instantaneous recordings that can be played back on any standard 45-rpm record player. Dimensionally, they conform to the same standards as commercial 45-rpm phonograph records and have the standard 1½-inch diameter center hole.

For maximum ease in recording and reproduction, a separate brass center-hole adapter is supplied. This permits these discs to be cut on any disc recorder with the standard center pin and drive pin. After recording, the disc is ready for immediate playback on a 45 rpm phonograph, without any additional punching-out operation. This gives a smooth, clean center hole of precise dimensions, assuring trouble-free operation on automatic changers.

To record on one of these 7" Audiodiscs, the brass center-hole adapter is simply placed over the center pin on the recorder turntable. The large center hole of the disc fits snugly over the adapter and the drive pin engages the drive-pin hole of the disc in the usual manner.

Paper labels on both sides of the disc are of sufficient thickness to give ample clearance between adjacent surfaces at the center of stacked recordings, assuring proper operation with the automatic changer mechanism.

The 7 inch, 45-rpm Red Label Audiodiscs are priced at $1.50 list each. Two brass center-hole adapters are included in each package of 25 discs. The adapters, of course, can be re-used indefinitely for any number of recordings.

Resharpening Service

(*Continued from Page 5, Col. 3*)

What Points Can Be Resharpened

All Sapphire and Stellite recording Audiopoints and all Sapphire playback Audiopoints can be resharpened under the Audiopoint Resharpening Service. This service can also be utilized for *any* sapphire or stellite points of domestic manufacture. Steel points can not be resharpened.

How to Return Points for Resharpening

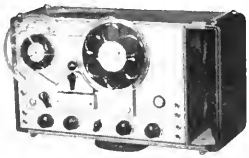
Just give the used points to your Audiopoint Distributor and tell him that you want them resharpened. He has a supply of special mailing cards and return envelopes which assure prompt and safe delivery to the resharpening plant. The points will be resharpened and returned to the Distributor *within five days* from the time they are received at the plant!

If you are a large user of Audiopoints and would like to save a little additional time by returning the points direct to the resharpening plant, your distributor can probably arrange for this and supply you with a quantity of the convenient mailing cards and self addressed return envelopes. Cards are available for holding four, eight or sixteen points. When points are returned direct from the user, the name of the Distributor through whom the billing is to be handled should be filled in on the space provided in the cover of the card.

Distributors who take active advantage of these Audiopoint Resharpening facilities are rendering a real and valued service for their clients — helping them to make substantial savings in the cost of recording and playback points.

NEW PRODUCTS

"CROWN" Portable Tape Recorder



The "CROWN" recorder, manufactured by International Radio and Electronics Corp., Elkhart, Ind., is a dual-speed, dual track machine with 40 watts power output. Listed features include: frequency response of 3¾ and 7½ inches per second; fast forward, 160 in. sec.; rewind, 192 in. sec.; flutter and wow, 0.4%; output to total noise level, 52 db. Two microphone inputs and four output channels. Simultaneous recording with public address facility. Separate volume control for monitor and PA outputs. Includes 6" by 9" 10-watt speaker. Also available in DeLux model with single-track head. Weight, 36 lb. complete. Price, $295.00 net for standard model; or $325.00 for DeLux model.

MASCO Portable Disc Recorders

Mark Simpson Manufacturing Co., Inc., 32-38 46th St., Long Island City, N. Y., offers two portable disc recorder-reproducer units with PA facilty — Model RK-5SLR with built-in AM tuner, and Model RK-5SL without tuner. Include provision for recording and playback at both 78 and 33 1 3 rpm. Three separate inputs for recording from microphone, direct from phonograph, and direct from radio. Recording from microphone or radio independent or simultaneous. Built-in 5-watt amplifier, 6" PM speaker, separate volume and tone controls, and recording level indicator. List price, $197.50 less radio; $237.70 with radio.

audio pointers for the Recordist

by C. J. LeBel, Vice President
Audio Devices, Inc.

THE AUDIO HEAD DEMAGNETIZER

C. J. LeBel

Occasionally Audio overreaches itself — we write about a new idea, and after a while the demand has grown to the point where we have to make the product.

The Audio Head Demagnetizer falls in this class. The virtues of demagnetizing magnetic recording heads were expressed in the AUDIO RECORD several years ago, after watching the effectiveness of the idea in a demonstration by Wentworth Fling. We soon found that it improved the reliability of laboratory measurements, and that the most critical studios were also finding demagnetization desirable. A sketch of a suitable device was shown in our booklet, FUNDAMENTALS of MAGNETIC RECORDING, but this increased the flow of requests rather than decreased it — for studios are seldom equipped to do machine work. It was finally decided to put the demagnetizer into production.

What It Is

The Audio Head Demagnetizer, shown in Fig. 1, is an AC magnet assembly provided with extended pole pieces shaped to fit the countour of the recording head. Properly used, this head demagnetizer will remove any *permanent magnetism* which may have accumulated in the recording head — thereby reducing noise level which is attributable to this cause.

Figure 2. Hysteresis diagram showing how magnetic condition of head is carried in opposite directions, but with successively decreasing amplitude, finally ending at zero.

How It Works

The Audio Head Demagnetizer enables the magnetic condition of a recording head to be carried through a series of hysteresis loops of ever-diminishing size, leaving the head substantially free of permanent magnetism, as shown in figure No. 2. This operation is the same as the action of an AC erase head on tape.

How to Use It

1. Put a single layer of self-adhesive cellophane tape on the tips of the demagnetizer poles, as shown in figure No. 3. This prevents scratching the surface of the head.

2. Plug the cord into a 110-115 volt, 60 cycle outlet.

3. Place the demagnetizer pole tips against the recording head of the machine. Move the tips over the entire pole surface of the head for about *one second*. Then move the demagnetizer slowly away from the head and disconnect it from the power circuit. Slow removal of the demagnetizer from the head is particularly important, since it is the gradual separation of head and magnet which causes the hysteresis loops induced in the head to diminish slowly in size, finally ending at the zero point.

4. Be careful not to overheat the demagnetizer. It should not be left connected to the power source for more than five minutes at a time. If it gets too hot to hold comfortably, disconnect it.

Why Demagnetize

Since the minimum noise level occurs with the tape in unmagnetized condition, it is important that the recording head impart no steady (dc) magnetism to it. This can only be true if the head is itself free from permanent magnetism.

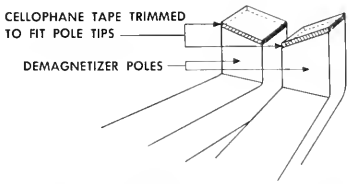


Figure 3. Sketch showing demagnetizer pole tips with cellophane tape in place.

When a recording machine leaves its factory, the heads are unmagnetized. However, music and speech consist of a series of transients, often not symmetrical in peak value. Other asymmetrical transients may occur in line noise, in starting and stopping the machine, and particularly during tests. The effect is cumulative, and after a week of steady use the recording head may have picked up enough magnetism to raise the noise level by several db and to increase second harmonic distortion slightly.

What the Demagnetizer Cannot Do

There are no universal panaceas in engineering and so the demagnetizer will not necessarily make your machine quieter. The following common causes for high noise level may exist:

1. Magnetized recording head.
2. Noisy input tube in reproducing preamplifier of machine.
3. Noisy resistor or condenser in reproducing preamplifier of machine.
4. Hum pickup in machine circuits.
5. Bias leakage masquerading as noise.
6. Faulty bias waveform during recording.

Head demagnetization, of course, can only remedy fault No. 1. If any of the other difficulties exist, they must be cured before demagnetization is worth while. For example, a number of machines have sufficiently poor bias waveform and enough hum so that these form the major causes of noise.

Different heads and different machines differ unpredictably in their tendency to magnetization, so that the easiest way to judge the effectiveness of a demagnetizer is to try it. If the unit fails to help your particular machine, it may be returned to your jobber for full credit — provided, of course, that it has not been damaged. The price of this Audio Head Demagnetizer is $12.00 List.

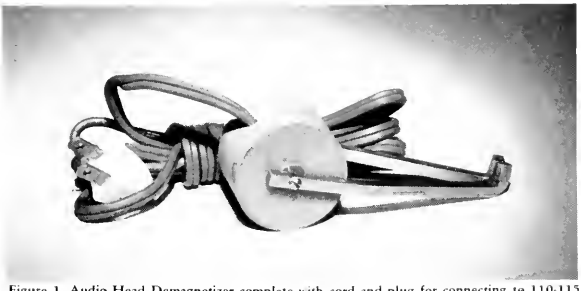


Figure 1. Audio Head Demagnetizer complete with cord and plug for connecting to 110-115 volt 60 cycle circuit.

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