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ALEX NAGY: Good morning from the Kennedy Space Center. We are at an eight hour hold which began at 10:00 this morning at T-27 hours on the countdown clock. This hold is due to be released and the count is scheduled to be resumed at 6:00 pm this evening Eastern Standard Time. This morning we have with us Jay Honeycutt from the Shuttle Program Office at the Johnson Space Center for a briefing on the flight plan for the STS-3 mission. Jay will also touch on some of the payload experiments because of crew involvement but I remind you that the 1:30 briefing this afternoon is a detailed one on the payloads, the experiments and if you have some detailed questions you should hold them for this afternoon. Jay.

JAY HONEYCUTT Okay. You know we're going to launch on Monday. The liftoff time is 10:00 the launch window will close at 12:32. We're going to launch into an inclination of 38 degrees and a final altitude of 130 nautical miles circular. Mission duration is about 171 hours. We'll land on seven days later on the 29th of March at Northrup Strip at approximately 10:27 Mountain Standard Time and 116th orbit. You might note that these are basically the landing time is the same and the orbit is the same as if we were going at Edwards just a couple of minutes later. There are principal objectives of this flight are to demonstrate the launch and entry performance, evaluate the payload environment during launch and entry, to perform some long term thermal testing on the orbiter structure and the subsystems. We'll transport the Office of Space Science-1 payload into orbit, perform some experiment operations on it and return it to Northrup. Again, this is the third in our series of operational flight tests so we will be verifying some orbiter hardware and software systems performance and acquiring data on orbiter crew and the ground operations ability to support during the operations phase. And we will additionaly provide some, conduct some contamination analysis within the payload bay to see what the environment will be for payloads in the future.

see LAST page

I'm going to run through these as Al said right quick and just really to give you an idea of what the types of payloads that we'll be flying and how much of this mission will be involved to science. I don't intend to go into the details of the scientific performance because of the fact you have a briefing this afternoon on that. But basically we're going to provide some, perform some measurements on emissions that come from the orbiter that might effect scientific observation and look at some of the effects of the orbiter in the orbiter tiles on orbit.

Principal one that involves the crew is the plasma diagnostics package which they will use. It's principally berthed here in the OSS-1 pallet. The crew will pick it up with the RMS and maneuver it around and above the payload bay to perform some of these experiments. This one is on solar physics,

this is principally non crew involved experiment in which it is basically turned on and it collects its measurements and the crew is not normally involved other than in some pointing. This one is a scientific experiment to determine perhaps some different methods of heat control on orbit. It again does not involve too much crew activity other than activation. Again this is non crew involved principally once it gets turned on and collects information while it's on orbit.

This one is a Life Sciences Experiment that we attempted to fly on the last mission and didn't complete it because of the fact that the mission was shortened. This is involved in determining how well plants will grow in a nongravity environment. Again, this is stored in a lower bay equipment bay the crew basically checks it each day after their eveining meal just to get a status of how well the plants are doing.

The three other ones which I don't have charts for, Induced Environment Contamination Monitor is another experiment that's stowed on the OSS-1 pallet. The crew will pick it up with the RMS similar to the way they are doing the Plasma Diagnostics Package move it around and check for contamination in and near the orbiter payload bay. The Electrophoresis Equipment Verification Test is to determine whether or not this particular hardware can be used for separation of some biological cells. It's a similar piece of equipment which was flown on the Skylab program and it's principally an equipment verification test rather than a scientific test. And the last one is the experiment that the young man I think is going to brief you on this afternoon and it is involved with how well or lack of how well insects can fly in the absence of gravity environment.

This is a quick summary of what we'll do each of the flight days. Day one we'll do our normal activities that you saw on two previous missions, ascent, main engine cutoff is at approximately 57 miles, we'll do the OMS-1 and OMS-2 maneuvers to get us into 130 mile orbit. The crew will go through their normal configuration activties for the spacecraft. Get our of their suits, and then activate the OSS-1 scientific experiments and then they'll perform a gravity gradient test which is a controlled systems test of the orbiter in which basically the spacecraft is put in a nose to the earth attitude and the crew and the reaction control systems are turned off and it's to try and determine whether or not the vehicle will stabilize itself in orbit.

Then we start a series of thermal tests, the first of which is tail to the sun thermal attitude which lasts for about one day. These tests, there are three of them in here and they are to determine how well the orbiter systems will perform under various conditions of thermal stress.

On day two, we'll start the first of the RMS activities, the unloaded test is one in which the crew jet maneuvers the arm

around unstows it maneuvers it around and basically becomes familiar with the operation of the RMS. The Electrophoresis Experiment is then turned on and run for some period of time and then we begin the first of a series of payload bay door cycles in which we are going to open and close or close and open the payload bay doors after we have been each of these long term thermal environments to see whether there's been any defamation or any we have any concerns about operation of the payload bay doors as a function of temperature. Which we don't expect to see I might add. Then we'll end the tail to sun test. We'll start a test of thermal control test which effectively as you know a bar-b-que attitude control system where you just basically put the vehicle in slow roll as it goes around earth.

Then we'll do on day three the first of the RMS loaded operations in which we will pick up the IECM off of OSS-1 pallet maneuver it around, and collect some contamination data. We'll then stow the IECM and deploy the Plasma Diagnostics Package in the same fashion. Once that's completed we'll start the second of the attitude control mode which is a nose to the sun test. On day four we're going to do some RMS heater tests, basically the same as the other thermal tests that we're doing just to determine how well the RMS functions as a result of the various environments that we're in. Again some more EEVT operations and the second of the deployment test with the PDP.

Day five we're going to do some thermal back test on the RCS thrusters which will be attempts to determine whether or not the cold environment has any effect on the RCS jets and we'll do a PDP again. Day six is some more RCS tests, another payload bay door cycle. We'll end the nose sun and go to a top sun attitude which will have the payload bay looking at the sun for about a day. And a number of OSS-1 experiments which will operate in just top sun attitude. The astronomy experiment for one that was shown on previous chart.

On day seven we'll do a flight control checkout activties prior to entry, some more OSS-1, another IECM, another payload bay door cycle, start our thermal conditioning for entry, and then early in the morning on the eighth day we'll deorbit and land at Northrup.

Now in the event that we for some reason have to foreshorten the mission as we did on flight two, these are our priorities activities for that mission. It will be a four day mission, day one will the same as in the nominal mission. Day two we'll do our tail sun attitude test as a number one priority the OMS test will be second and then there's deployed PDP science. Day three we'll try to get in some top to sun testing some more OSS-1 science, do our flight control checks and then enter on day four.

The end of mission activities as you know we're going to land at Northrup Strip as the primary spot due to the lake bed

being wet at Edwards. The alternate sites will be either the Edwards or Kennedy hard surface runways. Northrup Strip is 35,000 foot runways, it has an MSBLS microwave scanning beam landing system on runway 17 which is used to support autoland testing that next bullet should be familiar to crew. The crew is trained out there for a number of years at Northrup so they're quite familiar with the terrain. We will have realtime telemetry available. Voice will be through UHF. There will be no command uplink but that's not a concern to us. Again our primary objective as it was at Edwards was to get a crosswind landing. We have two runways availble for that in the event that the winds are not or down we will try to get an autoland test down to 300 feet we'll do that on runway 17. And that's all the charts that I have.

ALEX NAGY We're going to talk crew activties today Jay.

JAY HONEYCUTT Yeah, the crew is going to arrive at Patrick at 11:30 local. They'll T-38s for an hour and a half at Patrick and they'll then depart Patrick for the crew quarters in the O&C building here arriving about 3:00. At which time they'll go into a review of the flight data file generally at about 6:00 this afternoon and then they'll continue their flight data file review and I think they're going to go to bed about 10:00. In the morning they're going to fly the Shuttle Training Aircraft at the Shuttle Strip out here between 7:00 and 9:00 and they have a Pad tour after that. Then they have some briefings by Joyce Pages on systems status and a review of the count and the hold procedures.

Tomorrow afternoon they have as much free time as we can get for them and some more review of the flight data file. Then again it will be about 6:00 and then on launch morning they'll get up at 5:30 to have breakfast, get a quick physical, quick weather briefing and then we'll depart for the Pad and enter during the L-2 hour hold.

ALEX NAGY There will be hard copies of this briefing availble a little bit later on the racks in the news center and the copies are also being sent by facsimile to the other centers on the loops so that they will be available at those places later also. We'll take questions now if I don't call you please identify yourself and your affiliation. Harry Colkum.

HARRY COLKUM Aviation Week Mr. Honeycutt, you said the window closes at 12:32?

JAY HONEYCUTT That's right. That's the nominal closing. That's a little earlier than it was at Edwards and the principal reason for that is because it gets for the REV 5 deorbit case it gets a little bit it gets dark a little bit earlier. We can extend that if we actually hold up into that period of time. The real constraint will be the transatlantic abort site at Rota. It's about 28 minutes later I think it gets the weather the visibility

is unacceptable. So what we will have to do in that event was make well four hour early deorbit opportunity as opposed to REV 5.

CRAIG COVAULT from the 116.

JAY HONEYCUTT No this is for the REV 5 deorbit. This is to support a REV 5 deorbit. That's what drives you toward the closing of the window.

CRAIG COVAULT some confusion about that landing time. You said it was 10:27 Mountain Standard Time. Should that be Pacific Day Light Time?

JAY HONEYCUTT I don't believe. It was it's unless I just converted wrong. I could have converted wrong.

CRAIG COVAULT It was a different time from what was given me just now by the people at ...

JAY HONEYCUTT I thought the original landing time was about 9:30 Edwards time.

ALEX NAGY That's easily found inside I don't think we have to dwell on that one. Did you have any more right now? Okay in the back Mark Kramer.

MARK KRAMER I must confess my confusion about the change in the launch window. Could you go back to that Revolution 5 deorbit.

JAY HONEYCUTT Yeah, if you once you get on orbit you have the first opportunity for landing in the event that you have some serious problem the first planned opportunity is during REV 5.

MARK KRAMER You mean of course not included AOA.

JAY HONEYCUTT Not including AOA. Right.

MARK KRAMER And to make this possible to land at White Sands in REV 5 you've got to close the window earlier is that what .....because of darkness at White Sands. And what time would that landing be at White Sands for REV 5 deorbit do you know?

JAY HONEYCUTT I'm not sure. It's extremely a low probability occurrence anyway I'm not I can get that for you but ...

MARK KRAMER Okay and then you said the other constraint the Transatlantic abort was would you talk about that too please.

JAY HONEYCUTT It's the same situation. The transatlantic abort site is at Rota, Spain and of course you have to get in there in daylight also and so the launch window is constrained by when darkness occurs at Rota which is about a half an hour later than..

MARK KRAMER But of course that doesn't change regardless of whether you go to Edwards or White Sands. I mean you're going to have darkness at Rota.

JAY HONEYCUTT The only point that he was making was that it's a little bit earlier than it was with the normal Edwards landing and the reason for that is because we would not do our REV 5 deorbit into Edwards. We would deorbit into Northrup on REV 5.

MARK KRAMER One final question. So what you're saying is you've got more sunlight at Rota you cut off the possibility of landing at Rota earlier is that what you're saying.

JAY HONEYCUTT No it does not change. It Rota doesn't change.

Is there any reason for aiming at a launch window at 10:00 am when on the first STS it was 7:00 am.

JAY HONEYCUTT I think the experiment folks will talk to you more about that this afternoon but it has to do with the sun angles for the Beta angle for some of these experiments. It was the driver that caused that.

LAZLO DOZZA Voice of America What ground facilities do you have at Rota.

JAY HONEYCUTT It's principally those that are availble at a normal naval air station. There are some capabilities there minimal capabilities there to get the crew out and get the vehicle basically powered down and certain of the experiments out but they are very limited capabilities due to the fact that the probability of going there is very low.

JAY BARBARY We were originally given when it was changed to landing at White Sands that it would be plus or minus one minute out of mission control the difference in the length of flight. Are you saying now that it's at 27 past the hour that you were going to touch down at White Sands?

JAY HONEYCUTT I believe that's right. That was the numbers I was given in Houston.

JAY BARBARY Was 27. What do you recall the original was it 24 past the hour one 24 our time I think? So it's about what three minutes I think.

ED TOBIAS AP Radio You're talking now about landing possibility autoland of 300 feet. Is that not a little bit higher than what you had planned for Edwards. Were you talking about 200 feet at Edwards?

JAY HONEYCUTT No sir it's the same as at Edwards.

ED TOBIAS Okay. One associated that if you have to go to a secondary landing site do you have a preferance between the hard runway at Edwards and KSC here?

JAY HONEYCUTT No it will be a function of the weather. Principally the weather. The crew is obviously more trained to go into Edwards, but they are equally trained here and we feel comfortable that they can come in either plan.

DAN ..... Is this liftoff planned to be significantly more stressful as far as max Q and that is concerned compared to the previous ....

JAY HONEYCUTT ...significantly more. It will be slightly more since normal expansion of the envelope but it's not I wouldn't call it significant.

Are you sure that autoland figure was 300 at Edwards.

JAY HONEYCUTT 200 or a long long time.....

You said the 300 you said there was no change from Edwards.

JAY HONEYCUTT That's my understanding. It's always 300 feet.

We can confirm that for you a little later if you want to check the query desk just to be sure.

JOHN WILKS Washington Post The payload bay sun and the nose sun and the tail sun are three objectives, three priorities on this. Could you explain that to us a little bit and why the times were chosen for each one? One is 30 hours I believe and one is 26 hours and one is 18 hours.

JAY HONEYCUTT Those are tests to principally to determine the effects of both hot and cold environments on the subsystems and the structure of the orbiter. The length of time was determined by our thermal people who feel that it takes that period of time in order to adequately allow the surface and the equipment to adequately stabilize at those particular temperatures that they will see in those environments.

Why is the tail to sun the number one priority.

JAY HONEYCUTT You got me there. I'm not sure I'll have to find that out for you.

Are there any more question here. Right here in this second row.

CARLOS BYERS Chronicle What are the maximum temperatures and minimum temperatures that you expect on that it's just not really

clear to me as to what the maximum and minimum temperatures you are expecting to see in this thermal testing.

JAY HONEYCUTT I don't have those numbers. I'll have to get those. I'll try to get those for you today. But, we have some people down here...that maybe can get that to me and I'll get it out this afternoon.

What facilities do they have for making the orbiter safe.

JAY HONEYCUTT There's a complete capability here. As you know we plan to land here the plan right now is on flight 5 so we have a complete all equipment all the people are have been trained here the convoy equipment is all here and so we would expect no impact to land here.

REED COLLINS CBS Did you tell us that there is no priority as to secondary landing sites between the hard runway and the hard runway here? Did you say that even though you have taken the 30 carloads of equipment into White Sands where in this case it would be useless to you. Does Edwards have absolutely dominancy in all that equipment?

JAY HONEYCUTT No sir, they don't have absolute dominancy. They don't have they have basically the equipment that will be left there that which is required to safe the vehicle and power it down.

REED COLLINS Well then having done that it gives Kennedy more equipment.

JAY HONEYCUTT That's correct. But on the other hand the crew is perhaps a little more familiar with the Edwards landmarks and that sort of thing. They have been training there so we'll make the decision principally on weather I think. What the weather is here versus the weather at Edwards.

Assuming that we are not able to go into Northrup which is

Making the general assumption then making the assumption that the weather is equally good here and at Edwards and no good at White Sands there is no priority.

JAY HONEYCUTT That will be discussed in the by the management in the management team meetings and we'll probably decide that on the day before entry. But at this point we don't have a priority as to which place.

Were there any questions from the centers? There are none. If there are no more questions here, let me remind you that the next briefing is at 1:30 this afternoon on payloads and experiments. Thank you very much.

END OF TAPE

* BECAUSE OF THE NUMBER OF QUERIES PERTAINING TO THE LAUNCH WINDOW AND THE LANDING TIME AT WHITE SANDS, THE FOLLOWING INFORMATION WAS RECEIVED FROM CLAUDE GRAVES, CHIEF ENTRY ANALYSIS BRANCH, MISSION PLANNING AND ANALYSIS DIVISION, DATA SYSTEMS ANALYSIS DIRECTORATE, JOHNSON SPACE CENTER:

LAUNCH WINDOW 10:00 AM TO 1:16 PM EST

LANDING TIME 11:27 AM MOUNTAIN STANDARD TIME

10:27 PST, 12:27 CST, 1:27 EST

Good afternoon, I'm Jim Elliott with the Goddard Space Flight Center, which is managing the OSS 1 payload on STS-3. The format for this afternoon: we will have the OSS 1 briefing and then we will have questions. The next two speakers will be the Marshall Experiment representative, Dr. Bob Noumann, and our getaway special representative Jim Barrowman from Goddard Space Flight Center. And then we will again have questions and then break and we will bring Todd and his bee experiment up for a presentation and questions at that time. Right now we will proceed with the briefing on the OSS 1 pallet and the experiments on it, and here to give you the presentation is Dr. Werner Neupert, the mission scientist from Goddard.

DR. WERNER NEUPERT Thank you, Jim. I'd like to welcome you all here for this briefing on the OSS 1 payload that's flying next Monday, and hope we can convey to you some of the excitement that we feel in having this opportunity to fly a very interesting scientific package on an early shuttle flight. I'd like to divide the briefing into two parts: first I'll give you some of the background leading up to the development of the instruments and their activities on STS-3. Then, for the second half, we will have an abbreviated version of a video tape that actually discusses the individual experiments. I think you will find that very informative and certainly you'll be able to see it again if you would like to do so.

Let's start by considering the background opportunities that are available to us. Early on NASA identified the first several flights of the Space Transportation System as test flights that would evaluate the performance of the orbiter systems. This is, of course, the primary objective that supercedes everything else that may be done on these first four flights. However, a second objective was identified, and that was to demonstrate the capability of the shuttle to do scientific research. Also included as an objective was the measurement of the environment that the orbiter carries around itself in space as it travels around the Earth. While the scientific activities, the demonstration of the orbiter's capability to do science is secondary in terms of the entire flight, it's obviously extremely important for the OSS 1 payload and the experimenters that are flying on it. We are asking questions such as: What kinds of observations can actually be made from the shuttle? It's not a specialized spacecraft particularly clean for optical astronomy observations or maybe magnetically neutral in order to measure fields and plasmas in the Earth's upper atmosphere. It is a vehicle for carrying payloads into space. Some care has been taken to make it clean, but obviously we need to evaluate how well the actual orbiter has satisfied those goals and we again need to evaluate how well it can be used to carry out scientific observations.

Secondly and perhaps more importantly, we need to explore how that orbiter can be used for new directions in space research. I think this is particularly important because right now we are trying find our way, how to use that orbiter most effectively. And sometimes we call the OSS 1 the pathfinder mission, because we believe that there are capabilities in the orbiter that we can take advantage of in carrying out a scientific program. Opportunities haven't been available before, and that we may very well discover scientific activities that can be carried out extremely well from the orbiter.

So these are the two objectives of our payload that you want to keep in mind as you view the film and as you look through our documents. Perhaps I should,...well let me give you a little more background.

Having decided upon this set of objectives, NASA issued an announcement of opportunity. This is a formal way of telling the scientific community that there's a chance to do some science. There's an opportunity to build experimentation, take some data, analyze the data, publish the results, and generally it's defined in terms of a particular spacecraft that's being used. In this case, the opportunity said, we have this orbiter available, obviously the science is not the highest priority, but what can you do with it. Here are our overall objectives. A very large number, I think something like 140 proposals were received, and of those eventually 9 were selected for flight on this particular mission, under the heading of the OSS 1 payload. The OSS 1 being the Office of Space Science, the department at NASA Headquarters that had the management responsibility. May I have this first vugraph please, and also the one in the middle. This shows you the layout of the 9 instruments. It's difficult to see in this vugraph, but basically 8 of them are carried in the orbiter bay on this ESA supplied pallet, actually a photograph of it is shown here during the integration into the orbiter itself. One of them, the plant lignification experiment is carried in the middeck of the orbiter's cabin.

I'd like to introduce you to the principal investigators or thier representatives, really for the purpose of identifying them, so that if you have any questions after the formal part of this presentation, please feel free to talk with them. They have displays, they have models and their own press releases that they'd be happy to distribute to you. First of all we have Plasma Diagnostics Package, and the principal investigator for that is Stan Shawhan, who is available with here, stand up. We have the Vehicle Charging and Potential Experiment, the principal investigator is Peter Banks, and he's represented by Roger Williamson; we have the Spacelab Induced Atmosphere Experiment, Jerry Weinberg; Thermal Canister Experiment, Stan Ollendorf; Solar Flare X-ray Polorimeter Experiment, Robert Novick; the Solar Ultraviolet Spectral Irradiance Monitor, Guenter Brueckner; the study of influence of weightlessness on lignification in developing plant seedlings, (garble) Dr. Cowles is represented by

(garbled) Dr. Cowles is here and we also have Carol Peterson in and Bill Scheld representing that experiment. Next one is the Microabrasion Foil Experiment, Tony McDonnel from England, I don't believe and finally the contamination monitor package, Jack Triolo. Also I would like to identify three key people in the programs that have been extremely instrumental in taking this from a concept and making it into this flight package and the operations behind it. We have Robert Kennedy the program manager at NASA headquarters , we have Dr. Eric Chipman, program scientist at NASA headquarters and Kenneth Kissen project manager at the Goddard Space Flight Center. Well lets get into the technical part now and ask well how are these instruments to take advantage of the flight opportunities and I would like to walk you through the scenerio. Could we move that to the right, well we'll start over here on the left. The thermal attitudes for this flight are predetermined for us because as you know this is the flight in which the orbiter will be exposed to extremes in temperature in order to evaluate the engineering systems. That have to work under those circumstances and therefore the flight attitudes were defined to be three in number. Details of the sun attitude at first is something like 26 hours which would heat up the rear end, the engine end of the orbiter and provide an evaluation of that under very warm condition. Then the bird would be turned around and fly for 80 hours and nose to sun so that the engine end would become quite cold. That would be followed by about 28 hours of bay to the sun in which the engineers could evaluate the operation of the payload bay doors under circumstances when the system was very hot. And these three attitudes were then to be interpersed with passive thermal controls to equalize the temperature in going from one mode to another. Now you can see that these attitudes do provide us with opportunities to carry out scientific observations. For instance when we are flying with the tail to the sun so the sun is invisible and also the belly to the earth we have a very good view of the heavens, so this automatically defines an opportunity for astronomical observations and that is in fact when Jerry Weinberg's induced atmosphere experiment will be viewing the heavens and studying the diaconal light and scatted light from stars. It also provides an opportunity for the space technology experiment, the thermal canister to evaluate its operations under very cold conditions because obviously the orbiter bay is looking out into free space and getting very cold. We will also begin our space plasma physics observations during this period. On day, well after the 26 hours and in particulary on days 3, 4, and 5 while we're aiming toward the sun, will be the prime operating time for the space plasma physics investigation, the plasma diagnostics package and its operation on the remote manipulator arm deployed and mapping the plasmas in space around the orbiter and I think its going to be one of the highlights of the operations and we certainly look forward to success of those particular operations. Finishing with those 80 hours we go park to the sun and obviously solar physics is the thing we want to do here. The two solar physics experiments will be making nearly continuous observations whenever the orbiter is in daylight.

Space technology will have an opportunity to evaluate the canister system under extremely hot conditions and then finally at the end there will be a small amount of passive thermal control to equalize temperatures before the orbiter comes back in again. I think the, when you look at the video, you'll be able to see how we have been able to take advantage of these situations. And really the flexibility in operating the space, the orbiter systems to provide an maximum amount of science for the investigators. For instance there will be a short interval when the tail is actually dipped down slightly so that the induced atmosphere experiment can get a better view back across the tail toward any contaminent clouds that may be there as well as getting a better view of the zodiacal light. While we are flying nose to sun there may be a chance if a sort of flare occurs that the crew would be able to reorient the ship and look at that flare for something like 5 minutes so that the flare experiment can get the maximum scientific results. During the solar physics portion of the orbit the crew will actually be fine tuning the pointing of the instruments themselves not the orbiter. In order that they are centered precisely on the sun, something that the ultraviolet experiment needs in order to make the precision ultraviolet observations that are its objective. I think as we view this film, we can start to appreciate the unique capabilities and the possibilities that the orbiter's flight around the earth opens up for some of these first space experiments. As I say, I think we look forward to a very exciting opportunity and operations and we fully expect that we will satisfy the word "pathfinder" mission in our title and we will be able to provide some new directions for space science in the next decade.

Now I would like to call for the OSS-1 film please, the video tape. I do have some copies of the text so if there is anyone here who hastily taking notes why don't you just sit back and enjoy it. I should also add that there are visual materials in the press site that people may want to pick up. I'm going to apologize we had set this up so that the first 3 minutes were deleted. This is really a commercial for NASA, and we felt that we really didn't need to show this first part, I had expected the tape to start with the introduction to the experiments. Obviously that isn't the case so perhaps we could just turn up the volume and listen to the entire tape.

(TAPE) Included in Columbia's scientific cargo is a group of nine investigations known as the OSS-1 payload. This project was so named because it was the first shuttle payload to be sponsored by NASA's former office of space science, now called the office of space science and applications. Management of the OSS-1 shuttle payload project has been the responsibility of Goddard Space Flight Center in Greenbelt, Maryland. After launch the Columbia begins orbiting aproximately 150 miles above the Earth. Three hours into the orbit the payload bay doors open exposing the OSS-1 pallet to space. Except for the door opening and closing tests at extreme temperatures, the doors stay open until just before

the descent phase begins. While in orbit the shuttle travels through the ionosphere region which forms important buffer zone between the Earth's atmosphere and outerspace. The ionosphere contains plasma, an electrically charged gas resulting from the energizing of the Earth's upper atmosphere by the Sun's ultraviolet radiation. As the orbiter moves through the plasma it creates a wake (tape delete) to remotely manipulate this mechanical arm (tape delete) and lifts the PDP off the pallet and moves it to several positions above the payload bay for observations of the wake. The PDP also measures electromagnetic interference created by onboard shuttle electronics. Knowledge of the extent to which the orbiter is producing such static interference will be necessary for designing and operating sensitive receivers used in future shuttle experiments. After observations are made the arm must restow the PDP in its locked position on the pallet. Several times during the mission the PDP operates in conjunction with other OSS-1 investigations - the Utah State University vehicle charging and potential experiment also known as VECAP. Part of this experiment consists of a fast pulse electron generator. This devise emits pulsed electron streams of varying duration and intensity above the payload bay. The arm then moves the PDP through the stream of electrons to study how electrons interact with the surrounding ionosphere. These observations will further the understanding of such interactions which occur in nature. If there are enough atoms in the plasma to become disturbed by the electron stream, a violet glow similar to that produced in a test chamber at Johnson Space Center may be seen by the astronauts. The VECAP experiment also consists of samples of some of the materials which comprise the Orbiter's outer surface. These materials provide a means to study the electrical charge buildup on the Orbiter caused by its movement through the ionosphere and by the emission of electrons from the VECAP generator. A sample of Orbiter insulation is used to measure electrical charge buildup on the nonconducting materials which comprise 98% of the Orbiter's outer surface. A metallic plate is used to measure the flow of electrical current from the ionosphere back into the Orbiter through uninsulated metallic surfaces. A spherical probe, also part of the VECAP experiment, is used to measure resulting voltage between the Orbiter and its surroundings. Because electrical charge buildup can affect scientific measurements on the shuttle, VECAP findings will indicate how much compensation may be needed in calibrating future shuttle instruments. Although the Orbiter is engineered to produce a minimum of dust and other particle contamination, a certain amount cannot be avoided. OSS-1 is studying the extent to which such contamination might affect future sensitive astronomical observations on the shuttle. The University of Florida Shuttle Spacelab Induced Atmosphere Experiment, formally flown on Skylab, consists of a combination photopolarimeter camera system. This instrument makes observations of shuttle induced dust clouds and other particles. It also scans the distant sky to measure the polarization intensity and color of light reflecting from dust particles in the Solar System and Milky Way. During the mission, the astronauts plan to fire

thruster jets to reposition the Orbiter 10 degrees down from a direct tail to sun position. This allows the instrument to better observe how the contamination cloud created from a thruster firing and other dust around the Orbiter might interfere with viewing the heavens. The effect of water dumps and any Orbiter leakage are also subjects for observation. During shuttle flights, thruster firings, water dumps, and other operations may also cause contamination to condense on instruments in the payload bay. Although little of this condensation is expected, an Air Force sponsored contamination monitor package serves as a check on the buildup of condensable contaminants on pallet instruments as it actually occurs during shuttle ascent, orbit, and descent. Instruments carried in the Orbiter's payload bay are subjected to temperature changes which can vary between 200 degrees Fahrenheit when the bay is facing the sun to approximately 150 degrees below zero in the shade. Presently shuttle experiment developers are forced to tailor their designs to protect their experiments from such temperature extremes. The objective of a Goddard developed thermal canister experiment is to demonstrate a better way to maintain the desired temperature environment around an instrument. The experiment uses heat pipes which can work in connection with a computer to transfer heat between hot and cold areas. If successful, this technology could provide a controlled temperature environment in which future space instruments could operate despite severe external temperature extremes. During flight micrometeroids or interplanetary dust particles may sporadically bombard the pallet. The University of Kent in England has provided the OSS-1 pallet with a Microabrasion Foil Experiment as a means to learn more about these particles. Mounted on top of the thermal canister experiment, this one-square-meter sheet consists of 50 pieces of aluminum foil varying in density. As the micrometeroids hit the foil's thin surface, they puncture the foil and form craters. After flight, the foil sheet will be returned to England for chemical and density analysis. There is increasing concern over the possibility that manmade pollution may change the composition of the Earth's upper atmosphere, thereby allowing ultraviolet radiation from the sun to adversely affect life on Earth. Because of this concern, accurate measurement of this radiation is necessary. The Naval Research Laboratory's Solar Ultraviolet Spectral Irradiance Monitor, known as SUSIM, undertakes to make such measurements. Containing two spectrometers, the objective of the SUSIM is to constantly measure the amount of emitted ultraviolet solar radiation during the time that the payload bay is facing the sun. The SUSIM also contains attached sun sensors which the astronauts plan to use as a guide in pointing the payload bay directly at the sun during the 28 hours of planned solar observation. A solar flare is an occasional spectacular eruption of energy from the sun whose nature is presently a scientific puzzle. Radiations from the solar flare include x-rays that enable us to study the origin of this energy. The major question is whether the x-rays come from very hot gas cloud or are the result of a beam of fast moving electrons smashing into the sun's surface. Should a solar flare

occur during the mission, the solar flare x-ray polarimeter (xperiment developed by Columbia University will attempt to answer this question by measuring the degree of polarization in the x-rays emitted from the flare. If a major flare is spotted at a time when the payload bay is not facing the sun and if time permits, the astronauts plan to reposition the Orbiter so that the observation can be made. At present, little is known about how plants will respond to weightlessness and how they will grow in space. On Earth plants form lignin, the skeletal but indigestable substance which allows them to grow upward in spite of the downward pull of gravity. Scientists are interested in learning whether plants might grow less lignin in weightlessness and instead produce more digestable substances such as proteins and carbohydrates. This question is being investigated in the OSS-1 Plant Lignification and Weightlessness Experiment by the University of Houston. The first of several such experiments planned for the shuttle, this experiment entails growing three types of plant seedlings during the 7-day mission. Just before launch, oat and mung bean seeds and germinated slash pine seedlings are placed in a mini growth chamber. The chamber is put into a stowage locker in the cabin's middeck. Within the container, the seedlings are maintained with a sealed in Earth atmosphere and supplied with heat, light, and water. Immediately after landing, the 7-day old seedlings will be removed from the Orbiter for photographing and chemical and microscopic analysis of lignin formation. Other effects on plant development will (lso be analyzed. The OSS-1 mission serves as a pathfinder in ...any ways. It provides an opportunity to show how the shuttle's unique capabilities can be used to explore new frontiers in the space sciences and space technology. Its measurements will characterize the shuttle as a vehicle for space observations and help in planning effective future shuttle research. The scientific information gathered by this and future missions will contribite to a better understanding of the world in which we live. (END OF TAPE)

I think that completes our presentation. Again I'd like to remind you that we have displays here and after the formal presentation by all of the experimenters, you may want to talk to our investigator. I call your attention to two interesting displays here. One is a quarter scale model of the plasma diagnostics experiment and then actually the little green house in space; the plants growing, provided by the University of Houston, so you may want to check those later on. Thank you very much.

All right, we'll follow the normal rules for questions now. Are there any questions? And please identify yourself and your affiliation when the microphone arrives. Go ahead Kevin.

(VIN SANDERS, C&M There seems to be some confusion about the ..gures that we see in various publications that are being released here and the film I've just seen on the temperature

differentials that are expected to be encountered. Is it 200 degrees minus or plus centigrade or farenheit? It's farenheit in the film, it's farenheit in Rockwell's handouts, it's centigrade in all the rest of the NASA handouts. Which is it and what are Rockwell working on in their specifications?

NEUPERT My recollection is 200 degrees farenheit or about plus 100 centigrade. It's about the temperature of boiling water. It's minus 200 farenheit, minus 200 centigrade which is about minus 150 farenheit I believe. There may be also some confusion about the surface temperature and the temperatures of instruments. Certainly the temperatures of the instruments that we have to accommodate is about the temperature of boiling water.

PAO Can we settle on one figure then?

NEUPERT The figure is plus 200 farenheit which is plus 100 centigrade.

KEVIN SANDERS Well there are other figures around. I don't know whether it's a farenheit or centigrade confusion or what. I wonder if I could ask another question regarding the electron beam gun. There had been talk I understand that there was a demonstration planned of using the gun to skywrite on the ionosphere or the surface of the atmosphere. Has any thought been given to that, has the idea been abandoned, and if so why. Does the electron gun have any military application.

NEUPERT I think there may be some confusion between this and some of the chemical release experiments that were planned. Not under this particular program but in some of the applications programs. You're well aware that there have been many rockets experiments that have released barium and sodium into the atmosphere. One of the instruments that NASA is considering for the shuttle is called a chemical release module which would have many of these charges of barium and other materials that could be fired off at various heights and under various orientations. Now those I think myself I've seen some fanciful concept of what that might look like in the sky and perhaps that's what you have in mind. So far as the military applications for electron beams in space, I really don't foresee any. As a matter of fact, one of the things that the experimenters are interested in is in fact how far will these electrons get. You have to understand that they are not going through a vacuum, there are going through the ionosphere. They will lose their energy to the particles of the Earth's upper atmosphere rather rapidly. Roger can probably give us the number but it's probably hundreds of meters or perhaps even less, maybe even hundreds of feet before the beam is altogether diffused and lost its energy.

ROGER WILLIAMSON, Coinvestigator on the VCAP experiment from Utah State University. The answer to the first question about skywriting is that somehow you got a hold of a very fanciful idea that we probably are to blame for at one time. It was a bit of

our humor unfortunately and I didn't know that that would ever (t out. It won't work, by the way. There is one little bit of truth in that and that is that on future missions there will be experiments using electron accelerators and on these accelerators the power will be as much as a hundred times greater and there will be some possibility of generating an artificial aurora. Most people are familiar with the northern lights or the aurora borealis or aurora astrolis and these lights that we see naturally occurring in the sky are produced by energetic electrons very similar to the type that we are going to emit and in that sense you may see something on future missions. Our power levels are way too low. As for the second questions about the electron beam guns or weapons in space, that is a completely different type of an instrument. We do emit electrons from the Orbiter but the characteristics are just completely different and I don't know of any relationship between the two.

PAO Kevin, NASA doesn't have any guns. It's really a generator.

DAVE DOOLING, the Huntsville Times I know that the PDP and SUSIM are slated for reflight on Spacelab 2. Are any of the other pallet instruments being considering for reflight, in particular the x-ray flare polarimeter.

NEUPERT No, there are no plans for NASA to be flying any other of those instruments.

CHUCK DECARO with Sage My question of PDP is this. If you're going to check for electronic interference, a baseline electronic interference from the avionics onboard the shuttle, won't that change later when you've got KU-band transmission to TDRSS and also when you have rendezvous radar. Won't it change significantly and you'll have to fly the package all over again. Second I have a question on a barbeque mode (garble)

NEUPERT Stan, perhaps you would like to answer that.

PAO This is Dr. Stan Shawhan from Iowa University.

SHAWHAN Yes, in the case of spaceflight 2 we're going to carry onboard a KU-band receiver to look specifically for that and we want to make a comparison on a partial Orbiter which all this is is a two pallet Orbiter with a full up payload system on spacelab. There should be different electrical levels for that too. KU-band systems, same antennas, different transmitter and receiving system. garble That's true. And we're particularly looking for the garble. Want to see what the field strengths are in and around the bay.

DECARO The other question is when you fly in the barbeque mode, will you be flying with the radiators off and flash evaporators off to see how it operates in that mode.

That's a technical question we don't have anyone in group I don't think that would be able to answer that.

(garble) RICHEY, Channel 9, Orlando Do I understand correctly from the film that the SUSIM experiment is the first and only way to measure whether or not more ultraviolet light is getting through from the sun since the chemicals have been in the atmosphere?

GUNTER BROOKNER from NRL Perhaps I can answer this question. It is not the first and only one of these experiments. Ultraviolet radiation from the sun has been measured since space research started. Actually the first experiment in space was a captured German V-2 rocket in 1946 which carried a little spectrograph on top of it and it was the first experiment which measured ultraviolet radiation from the sun. Since that time we have recognized that ultraviolet rays from the sun plays an important role in the upper atmosphere. We have also recognized that ultraviolet radiation from the sun in this specific wavelength span varies with the solar cycle. So and also we have recognized that the variability at the moment is less than our measurement accuracy. So what we will do is to increase the measurement accuracy to the point where we can really determine the variablity. This experiment will be flown over and over again over 11 year solar cycle from solar maximum to solar minimum in order to determine what the variance of the solar ultraviolet radiation is and then other experiments which measure atmospheric parameters can then provide clues about the correlation of how the upper atmosphere reacts to the varying degree of solar ultraviolet radiation.

RICHEY Would it be safe to say then that this experiment is the only way to measure over a long term whether or not we are depleting the ozone?

BROOKNER Yes it's part of a more complex program which takes this into account. The most important part is that we increase the accuracy. What the unique capability of the shuttle is is that the experiment comes back and can be recalibrated. These experiments have the very nasty characteristic that they destroy themselves in space. In other words they are destroyed by the very thing they want to measure. Ultraviolet radiation from the sun makes them blind so we must know exactly how much they are degraded and in this respect the shuttle is absolutely unique because we can go up there, measure for a day, come back, calibrate it again and we know exactly how much the experiment is declined.

CHICAGO SUN TIMES I have another question for Dr. Brookner, there was some indication, I think in the press kit about a relationship between the ultraviolet intensities at high altitude and total energy output of the sun. Would you discuss that briefly.

DR. BROOKNER There are similar cycles of ultraviolet radiation and the principal ultraviolet radiation over the whole solar surface, so you wouldn't expect any difference. But, then it comes very intensely from the active hodges, and the sun rotates for 27 days and therefore the ultraviolet radiation... it develops and changes with the solar maximum to solar minimum. Now the ultraviolet radiation in the sun is only a very small percentage of the total output of the sun, it's less than 1 percent and specific spectral region. But, it dominates completely the atmospheric heating of the Earth above approximately 50 kilometers, 30 kilometers to 100 kilometers. A small variation in the solar ultraviolet output can therefore create quite different atmospheric conditions. Now, and then go into the very exotic part of this, which is perhaps the most interesting. We have learned recently that stars, like the sun, can emit 3 orders of magnitude, more ultraviolet light and yet when you look at them in the visible they look like ordinary stars. And so somebody may in a hundred years, may like to check this again whether the sun has changed. So, he needs some base line measurement, and that's some of the things we are looking for.

PAO One question from Johnson, go ahead.

This is Kelly Beedee from Skyand Telescope Magazine: A couple of questions, quick ones, will the micro abrasion foil experiment determine anything about the composition impact of the bodies, and who will advise NASA of the active flare region should they occur.

TONY MCDONALD from Canterbury Yes, the position of penetration is enough so it wouldn't measure it optically at first, and then those areas are extracted for scanning electron microscopy, and in that, we examine the craters in great detail to magnification up to 50,000. And at that time, we can then use an (garble) x-ray analysis to actually measure the composition of the amount of the cosmic dust particles themselves because they are in fact partly evaporated and destroyed, but at least the residues of those particles. The thing that's interesting on the C9, the cosmic dust field, which the microfoil, microabrasion foil experiment will examine, is the contamination in space from rocket flights themselves because on the Skylab four windows, one has found that there are a class of craters which are peculiar, they're lined with aluminum, and these are in fact contaminants from rocket exhausts in space. And therfore, this experiment is very critical at this time to access not any of the cosmic dust background but the manmade debris.

COLUMBIA UNIVERSITY The question about the, how we'll know about the solar activity. A national oceanic and atmospheric agency, I guess it is, in Boulder, Colorado usually monitors the sun and radio optical bands. Also, it has access data from the EO satellite, and that data is radioed down to Earth, and in fact we will have a readout in JSC of the x-ray activity, x-ray

flux from the sun, and if we see that's going up, then it will ask permission on a certain mission rule to reaim the spacecraft towards the sun and hope that we can catch a flare during the operation.

NEUPERT I might add that that's not as eventful as one might think. That in fact during our simulation, in January, the flare occurred on the sun and the mission operations center and the payload operations control center went through the procedures that would be followed if such a event happened during the mission and had it been an actual mission we would have gotten very good data from that flare event.

TOMMY O'TOOLE from Washington Post Could you tell us why tail to the sun is the number one priority to this mission?

NEUPERT Again, I believe that it represents a need to understand how the orbiter RCS's operate at those high temperatures. I can't give you any details of why that particular length of time has been selected.

PAO I think we're going to have to break this one off and move onto the next group of experiments. So, at this time, we'll ask Werner to step down and I'd like to also remind you that the prinicpal investigators on these experiments will be around and available for interviews today and tomorrow and if anyone wants to arrange them, they should either talk to themhemselves or to see me over in the press site after this briefing is over.

The speakers will be Dr. Bob Norman and James Barrowmen.

END OF TAPE

(NOTE: This picks up at the end of the OSS-1 briefing)

PAO division of that center space sciences lab which has scientific responsibility for the electrophoresis equipment verification test and the mono disperse latex reactor. He is also a former of project scientists where the induced environment contamination monitor, so he will be briefing you on all three experiments this afternoon. I might add that Dr. Naumann is heavily involved at the first commercial use of the Shuttle, the joint NASA/McDonnel Douglas electrophoresis effort which will begin flying on the next Shuttle flight STS-4. You may want to talk to him about this after the briefing and I would like to spell out, point out that his name is misspelled in the briefing sheet, it really is N A U M A N N , Bob.

Naumann Thank you very much. I'd like to take the induced environment contamination monitor package first and describe a little bit about what it does and what we've learned on the STS-2, we flew it on that mission also, and then I'll move onto the other experiments. The package itself, if I can have the first viewgraph, are is a large box about the size of a desk, it contains some ten instruments that are designed to essentially monitor the environment that a payload would see from the time it was delivered here to the Cape, go through all the integration procedures that a payload would normally see through the ascent phase of the Orbiter, the on orbit operation, the descent phase, the deintegration and so forth and then provide us with a record of what that payload has gone through in terms of the particulate and condensable and thermal and humidity environment goes. So there are a set of instruments on the package to do that, there's simply thermocouples for measuring temperature, there's dewpoint, and a hydrometer onboard to measure the relative humidity, there are particle detectors, little air samplers that pull particles through them and then essentially weigh them by having them impact on various sensitive plates that are surfaced with quartz crystal so they can be measured and weighed and then there are optical samplers onboard which then we periodically can take off during the pre-mission operations and then post-mission to see how much change in optical properties have occurred during the exposure. The other part of the package then is designed to do the on-orbit monitoring and here we're looking for things like the particle and gas clouds that are around the Shuttle which were mentioned earlier. The main differences in what we're doing here, however, this the monitor package that has been flown on STS-2, it will be flown on STS-3, and throughout the development series of both the Orbiter and the Spacelab mission. So this allows us to compare from flight to flight, get a baseline on one and see how it changes on the other. We had an abbreviated mission on Spacelab 2 as you know, this mission gives us a much longer flight opportunity to study some of things that we didn't get to see on the last mission. In particular we are very

interested in the long period where the tail is oriented to the sun because this is an ideal viewing point for some of the optical measurements we want to make. We have a mass ometer onboard to measure the scattered molecules leaving the Shuttle and coming back and from this we can induce the water vapor around the Shuttle and other gaseous species that are associated with the induced atmosphere. The investigator team, by the way, as far as I should mention, is Ed Miller, is the project scientist at Marshall, and the package was developed primarily through the cooperation of Dr. Lubert Leger at Johnson Space Center and he heads the contamination, I'm sorry, the gases and particles contamination working group of that center and they're the ones that're responsible for looking over the design of the Shuttle and seeing that the design decisions, if possible, are made such that it can minimize the amount of contamination that the Shuttle does see. I have a very brief film clip, if I could have that please, it will give you a little bit of an idea what some of those instruments look like. Roll film 1 please. Let me work over here. Here you see the dewpoint monitor being assembled on the clean benches, it is actually being refurbished from the first flight prior to the installation for this present flight. The experiment scientist on this is Wally Parker and that's who's operating it. Here you see Jerry Owen loading the cameras, we have two camera photometers onboard to measure the particles floating around the spacecraft and I'll show you what that looks like in a second. He's making sure all the dust is out of it and he's about to put the film in it. This is the optical effects monitor, this is Roger Lenton who's responsible for that, this carousel that you see up in this region is loaded with optical samples and it periodically rotates, the samples are exposed and rotated back into the instrument and the reflectivity and the scatter from the optics are measured. You can see it there being cycled. These are the temperature controlled quartz micro balances that Jim Fountain is refurbishing and reassembling. These have very sensitive quartz crystals up here at the top with thermo electric coolers underneath them and they can be cycled anywhere from plus 80C to about oh something like minus 60C and they can measure something on the order of just a few nanograms per square centimeter of coating on them so this is how we determine the amount of deposition from gaseous components, and here you see the final package being integrated, or being closed up, just prior to shipment and integration. So that gives you a rough idea of the type of package and the sort of things that we have in it. Just to review briefly the results of what we found on the STS-2 mission. We did discover quite a few particles floating around in the payload bay as a result of the ascent operation. There were probably fewer particles, I guess, than we expected above 5 microns, but from 1 to 5 microns there were quite a few more than was expected. I should point ut, however, that on the STS-2 mission there were no ontamination sensitive payloads in the manifest. Therefore, only a very minimal effort was made here at the Cape to keep the

payload bay clean. Now, on this particular mission, considerably more effort will be made so it will be most interesting to compare what we see on this mission to what we saw on the last mission. We also have air samplers onboard which are essentially grab bottles which open up at various times during ascent and some during descent and the idea here is to see if we ingest things like engine exhaust products into the payload bay, hydrochloric acid among other things. The way these devices work is that they're preevacuated containers and they have active surfaces in them which are responsive to particular contaminants that we're looking for, we take a grab sample and then close it up and bring it back down to earth and then analyze the surface to see if it absorbs materials that we were looking for and I'm very happy to announce that we saw no ascent products whatsoever in the payload bay on STS-2, nor did we see any descent products. There we were concerned about some of the oxide and nitrogen and hydrazine things like that that used to thrusters as they are being jettisoned overboard. So we were pretty happy that the payload bay does not seem to ingest any of these particular, or any of these particular materials. We did see a little bit of deposition on the quartz microbalances but it would be about what you'd expect from a vehicle the size of the Shuttle. It was under about 10 to the minus 5 grams per square centimeter over the mission which we think is quite adequate to keep from ruining thermal control surfaces of the payloads that may be launched from the Shuttle and we also feel that it probably meets the optical deposition for sensitive optics if they have some degree of shielding on them. We saw very little scattering of heavier molecules, the offgassing molecules in the mass spectrometer, we did see some considerable water vapor coming back which is what we'd expect, our very preliminary analysis, and let me say this..it was very preliminary, indicated that the column density of the water cloud was on the order of 10 to the 12th molecules per square centimeter which was sort of the ragged limit of what most of the astrometers feel is alright for doing most of the observations that they would like to do. That measurement will be repeated with more precision, we have much longer time to make that measurement on the STS-3, plus we have a control gas release where we have a radioactively tagged water which we will turn loose as predetermined time. It is different from ordinary water in the fact that it is made out of O18 H2 and it responds with mass 20 so we can distinguish it from the Shuttle water and that will give us an opportunity to send out a cloud of known material and monitor what comes back. The other thing that we did see on the STS-2 particularly early in the spacecraft, we saw these on Skylab also and, in fact, all the other manned spaceflights that have ever been made. If I could have the next viewgraph, please, I'll show you what some of those look like. As you may have been able to tell from the film the camera photometer is a pair of 16 millimeter cameras that are mounted with about 1 meter baseline between them so that gives us a stereo view. And what I've done here, turn the lights down

just a little bit, please, so you can see them, please, Ok, what you see here now are the two views of the two cameras superimposed, we put a blue filter in front of one, a red filter in front of the others so you can see then the particle tracks show up in red and blue so this and this are the same particle but the perspective is different because of the location of the camera. So this gives us then by measuring this apparent distance we can then calculate what the distance to the particle is. By knowing the direction, we then can or the projection on the film we then can work out the complete X, Y, Z position of the particle and then we can back calculate the trajectory and try to figure out where the particle actually came from. Now the reason there are notches in here is because we periodically chopped the shutter, we know at what rate we chop it so that actually gives us the particle velocity. So this is one particle that's moving that direction, moving away from us and source was somewhere over here, these represent other particles, and, of course, as the particles are further away, the images get closer together. These two bright sides, by the way, are Caster and Polyix, and, of course, they would have the same parallex in both cameras, so the red and blue here superimposed to form white. So this is the type of analysis that we can do on the particle environment. I might point out that we saw numerous of these particles earlier in the mission and particularly when we were doing water dumps and things like this where you'd expect to see ice crystals floating around. We saw fewer particles as we went on into the mission and a number of particles seen actually decreased rather dramatically toward the end of the mission. So the STS-3 we'll get another chance over a much longer period of time to see how the particulate environment essentially calms down as the Shuttle stays up there. I believe that's about it for the IECM, we'd like to entertain any questions on that package now if anyone has any.

PAO Front row

Dave Dooling Huntsville Times Bob, how long is it going to take to cycle the IECM between STS-2 and 3 and give us another quick look at the data that you get on this mission?

Naumann I'm not sure I understand the question, let me see if

Dave Dooling How long to recycle the IECM itself and how long till we'll have the first quick look at the data that it gathers during the mission?

Naumann Ok, I think your first question is how long it takes to refurbish the IECM after STS-2 and get it ready for 3? Oh, I'm sorry. Right. Dave, you'll have to help me. How long was it between 2 and 3? We made it in that length of time, we really had to work to do it, but I don't really anticipate it would take any longer between 3 and 4. It's quite a chore to do that, but

...ts do-able and I can't give you a precise figure I'm sorry to say but it is something we can do. Well, of course, the analysis continues, Right, I think we put out a 45 day report which is a very quick look which is what we did on the last mission and that gives us a rough cut at what each of the instruments saw and some idea, and I think the quick look analysis will be a little bit more definitive each time we go because you know, the first time we had to figure out what the instrument was really doing so after we fly it 3 or 4 times we get to know it a little better and it's a little easier to interpret what it's trying to tell us. But I would say in about 45 days we'll have a quick look out and the final analysis is going to take some time longer than that.

PAO I understand from Marshall that the answer is 2 weeks?

Naumann Thank you.

PAO Are there any other questions?

Chuck DeCaro with Sage My question is on the decrease in number of ice particles, are you looking for the reason for the decrease as sublimation or vehicle movement or well are you looking for?

...aumann Well, that's a very complicated question. First of all just that ice is one of the things that we know is formed up there and flakes off and forms particles but they could be pieces of tile, pieces of insulation, dust that was trapped, a dust particle sitting there against the black sky, if you will, illuminated by the sunlight can be very bright, so we really don't know what the origin of all the particles are, we hope by detailed analysis, especially by looking at their trajectories we can get some idea of the particle mass to see how they get bent by the atmospheric drag, that is not an insignificant thing for the very small particles. By being able to backtrack maybe we can locate where they are coming, if they're coming from the region of say a flash evaporator, or a dump nozzle, we can determine that if they're coming from other regions then they are probably something else. So we hope over the full analysis to be able to give a kind of detailed description of where these particles are coming from and get some idea of what the generating functions of these are. I guess, in general, what we're trying to really do is understand the particulate environment, what generates it, so we'll know what not to do when we don't want the particle.

PAO Ok, are there any other questions?

...aumann Ok, I'd like to move on then to the next experiment pk3 ...hich is the electrophoresis verification test experiment. The

Experiment team for this experiment is Dr. Dennis Morrison from JSC who's here in the audience with us, and can answer questions I guess when we come to that. Dr. Snyder in Marshall, Dr. Paul Todd from Penn State University and Dr. Grant Morrow from the Michael Reece Research Center in Chicago. This experiment is a joint Marshall/Johnson Space Center experiment. It's actually a repeat or a reflight of an experiment that was actually flown on the Apollo/Soyuz mission. And the flight on the Apollo/Soyuz mission was only partially successful but it did have some rather tantalizing results that have intrigued a lot of people and there's been quite a bit of desire to see the experiment reflown and the data that we saw on the Apollo/Soyuz verified and essentially amplified. So that's how the experiment got started. If I could have the first viewgraph, you'd get some idea of the apparatus. This is sort of, this is the whole experiment opened out, it actually folds down into this little package here that can be stowed in a mid deck locker. In the open out configuration the device at the top is a Hasselblad camera which photographs the working area here and that's our main data source. Although on the modification we'll be flying on the Shuttle we will actually have some of the temperatures and voltages electronically recorded. The other modification on the Shuttle flight is the additional electronic accelerometer package so that we know exactly what acceleration the experiment has seen. I guess is that still on, Dennis, or not? Ok, good. The readouts that you can see here, I believe maybe the next vugraph might give you a better indication of what the actual package looks like. This is a control panel here, there's a clock here that is photographed by the camera that temperature are read out with LED readouts and can be recorded on film and on tape. Now the actual electrophoresis part of the experiment takes place back in this region and I think that perhaps a short film cut I have of that gives you a little better feel of how the whole experiment is operated. The principle of the experiment is the following: We have a glass tube which is placed in this receptor here and a sample of cells to be separated are put in a little slide and a prefrozen slide is inserted in one end of the glass column, allowed to thaw, the voltage is turned on and the cells then pick up a charge by virtue of the fact that they are immersed in an electrolite or a buffer solution and the charge is determinted by the molecules on the surface of the cell itself. So as you find the electric field the little cells are actually then caused to migrate or electrophoresed along a fluid column. And the amount or the speed at which they migrate or the distance over which they migrate is dependent on the charge to mass ratiole of that particular cell and presumably that will be different for cells of different types. So we now have a way of separating out in a time domain or spatial domain by causing these cells to migrate. When the experiment is finished then the current is turned off, there's a thermal electric cooler down under the slot

right here and a thermal barrier or a insulation pad is put over the top and the thermal electric cooler is activated and the cells are then frozen in place. They are then put in a cryogenic refrigerator returned to earth and then they can be sectioned and analyzed back on the ground. If I can roll film 2 this is a very brief film clip of the experiment in the crew trainer going through the motions of simulation. What you are seeing here is the pad being or the insulation pad being taken off. This is the electrophoretic column being inserted in the receptacles. Now he would plug in the fluid loop (garble) here if he were actually electrophoresing and turn the current on. This is now after the electrophoreses has taken place, the top thermal cover is being reinstalled and now the thermal coolers were being activated and the column will be frozen solid. Then after the column is frozen the thermal cover is removed. The column now is removed from the fluid loop. Being very careful not to break it. The little end caps now are rotated to be removed and then the frozen cells are inserted in the cryogenic freezer and returned. The samples that will be processed in this set of experiments are a set of standard particles that are being supplied by the Marshall Center by Bob Snider. These are human and animal blood cells that can be easily identified by their morphology after the experiment is over with and the purpose of that set of experiments is to really just characterize the degree of separation that we can get in a low g environment. Now this particular type of electrophoresis really cannot be done on the at all on the ground because the dual heating of the current passing through the electrolyte produces sufficient convection and just simply stirs up the cells and demixes them as fast as you can electrophoresis them . There are techniques for separating these cells on the ground but this particular technique does not work readily on the ground. There is a variation where you turn the tube up and put a density gradient into it called density gradient electrophoresis and you can do some work with that type of process for separation. So anyway what we really want to do with the standard particles is to characterize residual disturbances due to either crew activity, vehicle motion, residual electro-osmotic disturbances or whatever else may inhibit the, or prevent you from getting a good separation. Then there will be six other columns which are supplied by the Johnson Space Center which contain human kidney cells. And the idea here is to separate the cells or attempt to separate the cells according to function. Now this is one of the things that was done on the ASTP experiment on the Apollo/Soyuz experiment. We only got one successful column back from that unfortunately due to some other problems but we did get at least an indication that we were able to separate kidney cells by function, in fact, we were able to finish out one group of cells that produce the enzyme urokinase. And this caused quite a bit of interest and so that experiment will be repeated and the aim here is to use what we think and improved resolution we can get with this process in space to see if we can get a better separation with this

particular apparatus in space and can be achieved by the best available ground separation techniques. I believe that is really all I want to say about that particular experiment and as I say, Dr. Morrison is with us, so if you have questions I'll either try to field them or throw them to Dennis.

PAO Question, over here

PRESS How might the results from experiment impact the one you're going to fly in the next mission to McDonnell Douglas. Is there anything you can learn on this that is going to change something you are going to do on that one?

Naumann I don't think it would change anything. Let me make it clear that this experiment is not directly connected with the McDonnell Douglas joint endeavor. This is a reflight of an experiment that we have done earlier. It's a very early electrophoresis experiment and it's designed primarily to evaluate the static fluid electrophoresis. The McDonnell Douglas experiment is using continuous flow electrophoresis which is similar but a different process. Now there are some things that can be learned. Control of electro-osmosis is one that we of course is a premium in this experiment and is something that is certainly of interest to McDonnell Douglas. Other things like the amount of concentration of material that can be used is something that might be of interest to McDonnell Douglas, but let me point out also that this one is primarily separating cells and the McDonnell Douglas experiment is at least for the first several flights will be devoted primarily to proteins, macro molecules, in-soluable materials and knot cells. So the two are not really connected.

PRESS I guess, what I really was asking was what is the point of reflying this one if you've got something that I have the impression that was more sophisticated and more applicable to pharamaceauticals that the next one.

but let me point out also that this one is primarily separating cells and the McDonald Douglas experiments is at least for the first several flights will be devoted primarily to proteins, macro-molecules, in soluble materials and not cells. So the two are not really directly connected.

PRESS Okay, I guess what I was really asking was what's the point of re-flying this one if you got something that I have the impression was more sophisticated and more applicable to pharmaceuticals on the next one. I guess what I really, what the question is, what's the point of this one.

NAUMANN Okay, Well as I pointed out, the McDonald Douglas experiment does not separate cells. It may eventually want to separate cells but that's not at least in the cards for the first several missions. Cell separation is a very important biological problem, and being able to separate out, for example, taking a mixture of kidney cells which are very complicated, the kidney is a rather remarkable organ and there are cells in there that do all sorts of things. Being able to separate those out in quantities that can be brought back and analyzed from the research point of view has a great deal of biological interest.

PRESS Interest in who for what? Okay, well just I think the ability just to separate the cells according the function, to e able to use a purified group of cells and produce an enzyme although there are probably other ways of doing that. I would say it was one of scientific interests because cell separation is a major problem still in biological science.

PRESS Okay Bob, either for you or for Dennis this experiment came into the STS-3 manifests relatively late in the game. How was that accomplished, how did you manage it and what would advise people following you not to do?

NAUMANN Goodness, not to do huh? I'm not sure I know how to feel that one exactly let me start off by trying to answer your first question first. It came into being the fact that the hardware was there leftover from ASTP, and the fact that there was interest on NASA's part to go back and redo some of the things we did on ASTP, and the way the experiment actually was, came about was through a letter that was sent from the Director of Johnson Center to the Director of Marshall Center saying that we understand you people have a piece of apparatus and we'd like to fly it up on an early Shuttle flight why don't we cooperate and do it together. So, that answer was, I mean, the letter was answered affirmately and so Johnson then took the responsibility of developing the columns and the kidney cell part of the research which is also being done in conjuction with Paul Todd at Penn State and Grant Barlow, and also supplied the cryogenic freezer which is the life science freezer which goes on the spacecraft and then Marshall refurbished there old MA-11

experiment and delivered it to Johnson. Now, your last question, what would I do for, what was that?

PRESS In terms of how you got it into the manifests, the cargo it was late in the game and was their any, you got it into the cargo relatively late in the game and compared to some of the other equipment aboard how did you accomplish that and were there any particular problems that you encountered in doing it?

NAUMANN Okay I think Dennis can probably answer that question better than I could since he worked at the Center that did that.

MORRISON Well you say relatively late, it has been manifested for almost three years. And the project has been underway for about three, three and a half years. It turns out that some of the details of what we would have included in the experiment, for instance, the acceleration package that Bob mentioned we've had it late was actually a late manifested addition but the fundemental verification test was included three years ago.

PAO Will you identify yourself Dennis.

DENNIS MORRISON, the Project Manager for this.

PAO Any other questions?

NAUMANN Okay I like to move on then to the next package which is the Monodisperse Latex Reactor experiment. The principle investigator of this experiment is Dr. John Vanderhoff from Leheigh University, and Dr. Vanderhoff is in the ground and if any would like to address any questions to him plus his team which is Dr. McCauley, and Dale Cornfeld and Dr. Allaser, and I guess that's all.

The purpose of this experiment is to look at the process called emulsion polymerization in which monodispersed Latex particles are grown or produced. By Monodisperse Latex particles, what I'm referring to are what the newspapers sometimes refer to as little rubber balls, a little bit over simplified perhaps but these are latex spheres from around two and a half microns up to about twenty to thirty microns or maybe even forty microns and by monodispersed we mean they have a very very uniform size distribution in other words they are all exactly the same size or as near as we can make them. Now these kinds of particles have been around for some time in face Dr. Vanderhoff pioneered the, the some of the work in the production of monodisperse latex spheres when he was at Dow Chemical. And they ahave been used for inumerable purposes from callibration standards for sizing filters and pours various serological tests various other biological applications and I think if any of you

ave applications questions later I like to refer you to Dr. Vanderoff for those. The reason for this particular flight was at the time the experiment was proposed one could not make particles much larger than two microns with at least in production kind of quantities, and the reason for that is in the polymerization process what you do is you take small seed particles which are grown by a slightly different process, you swell them with monomer which is stryrene monomer you protect them from conglomerating with other particles by the addition of surfactant soap then you polymerize them and form essentially a rubber like material. Now the polymerization process is one which the particles then loose some of the surfactant protection they are very sticky in this process so you have to keep them somehow in suspension, and if they bang together and stick together you wind up either up with particles that are larger than you've been trying to make, or in the worse case you get a nice gooey mass that looks like some chewing gum or coogulant. Below two microns, Brownian motion keeps the particles in suspension, above two microns you have to stir the particles to keep them in suspension. Its the stirring process that causes the particles to agglomerate. So, the experiment was proposed then as a space experiment to then take away the tendency of these particles to sediment and I might point out also that during the swelling process the particles are actually lower density than water which they are suspended in and during the llumerization process they had a higher density than water so you got a problem where you cant neutralize the density by adding say heavy water or other things to them. So this was then the reactor on the first slide that I can show you that we finally put together. One of the experiment team Dale Cornfeld is shown in the background there with the actual reactor, this then is the can which holds four of these reactors that's bolted to the Shuttle Middeck, and then this is the electronics package right here which services the whole package. The electronics package in the outer can were made by Rockwell International the reactors were then General Electrics Space Division at Valley Forge. I do have a film clip on this which shows the reactor being assembled which may give you a little better idea, if you could roll film 3 for me please.

Here you see the reactor unit itself being installed into the cluster of the four reactors that are in the can. And the connectors being installed. This now is support electronics package and the small eight track cassette tape is being placed into the package. The cassette will record the temperature and the volume expansion using a plunger with an LVT on it to measure the expansion and that will give us some idea of the reaction kinetics or how fast the reaction is taking place in space, and now you see the package being bolted together and being ready for nstallation. Now since this experiment was accepted for flight, .. fact only very recently in the last couple months, there have been some developments in the field and some new processes have

been developed by various people which have allowed them to make larger particles than the two microns which originally we saw as being sort of the upper limit of what you could easily do on the ground. These particles actually are being marketed now on the open market, so when we saw this, of course, naturally we got a little concerned about it, Dr. Vanderhoff did some of the particles and at least had them analyzed, and it turns out that the particles that are available in these larger sizes as I can show you with an electron micrograph are very nearly monodispersed that is very nearly of uniform sizes but as you can see there are number of particles that do have condiserably larger sizes. So by the definition that Dr. Vanderhoff uses for monodisperse particles which I believe is plus or minus one percent size variation the available particles right now the commercially available particles really do not meet that. So, really the aim of the experiment now is been changed a little bit but what were really doing is trying to use the space process to see whether we can actually improve on a commercial product that is presently here and available on the ground. So that will be the, I guess, the primary aim of the experiment, and if there are any questions on that I will try to field them or refer them to Dr. Vanderhoff.

PAO Alright if there are no questions here, are there any questions at Johnson? Alright, no other questions then we'll, thank you Bob and we'll move on to Jim Borrowman. You can't buy your way into heaven I'm told but you can sure buy your way into the heavens and you can do that by plunking down about three thousand five thousand or ten thousand dollars to put an experiment in space on what is called the getaway special. And here to tell us about the getaway special verification flight test that will be made on STS-3 is James Barrowman who is Project Manager with the project at Goddard Space Flight Center, Jim.

JAMES BARROWMAN Thank you very much. Can I have the first viewgraph to show you what the package that we have on STS-3 looks like it gives me a real problem by the way, I'm not quite sure how to take a plain white can that is going to sit there and doesn't look like it does much of anything through the entire flight and make it interesting for you. I guess you have to view it kind of like a seed that we planted back there at the back end of the payload bay, one that is going to grow into three hundred or more similiar experiments, or similiar containers which are very diverse group of experiments in the future shuttle flights. That is the number of payloads that we have currently reserved in the getaway special program, this a precursor to those experiments, those cans, that really is not a scientific experiment at all, it is strictly an engineering kind of in the same manner that the OFT series on the shuttle is an engineering effort. We have included one scientific experiment in this from Goddard which is, really involves film but as a rule we're measuring things like temperature, radiation impacting on the

utside, that is thermal radiation, were measuring the types of acceleration we see during lift off and all of things are going to be put together in a package which will help the future experimenters understand a little bit better the kind of environment they are going to see, of course the very same thing that makes this a nice flight for other reasons makes it, the thermal extremes and the wide variety of environments that are going to be seen, allow us to survey and wide extreme of environments and hopefully be able to give are experimenters even though it's a one time measurement a reasonable idea of what they can expect in the extreme on their experiment. Now the, give you kind of, this is not just an empty can or a gadget without any thing inside of it, I'd like to get the, where is the first slide on the video if I could, not from the back but from the video. Off to one side you just see the payload being prepared at Goddard it has a self contained recorder and battery system, it draws no orbiter functions at all. We have our own control system, I'll talk a little bit about later, that talks between the cabin and the payload can, but other than that it's strictly a self contained payload in the sense that all of the getaway payloads are going to be self contained. The users that we have set up for the future payloads, the ones that are not, that are going to be using the same kind of data that we are producing here are going to report on STS-4 with a payload by Gil Moore and you'll have a chance to see Gil a little bit later on in my presentation. Gil is here at KSC for this launch. Now with the first slide from the back the accomodations that we are providing for the getaway special users are the can that you see in the picture and in this slide. It is a sealed pressure vessel so that they can have a non-space-qualified-type gear inside of it so that as there dipping their toe into the water of space experimentation they are protected somewhat for the space enviroment and also has thermal insulation around it and that will help slow down any reactions to similiar extremes that they will have to provide there own thermal control systems inside the can.

BARROWMAN Okay. There is a line in the Shuttle Orbiter bay that goes down through the wire trays and up to the sill area where these containers will be mounted. There is a hand held controller in the aft flight deck on this flight and all subsequent flights containing get away specials and the astronauts will use this hand held controller to select which of the switches will be flipped either on or off depending upon what the experimenters operational requirements are. The STS-4 experimenter on the next video slide is Gil Moore. Working with Utah State University, the same people who brought you the VCAP experiment on this payload on this flight, different, slightly different group, but, and a slightly younger group, they are going to be giving producing a group of nine different experiments in that small container the same size as the one that we're flying. They range, they include biological experiments, space processing experiments and physical science experiments all in that one small laboratory. So they're doing quite a bit of science. It's I think a very interesting precursor to the kinds of science that we'll be going on in the get away special program. There's going to be a lot of learning by young budding scientists, they'll be a lot of opportunity for new companies to try out new techniques on the Shuttle at a very low cost. Again the price of a container is at most $10,000 and the up front money is only $500 so they have quite an opportunity to invest a very small amount and learn quite a bit about what's possible for them in space. Like to entertain any questions about what the program or this particular payload.

CARLOS BYARS HOUSTON CHRONICLE (question not recorded)

BARROWMAN There is no power provided to either our precursor or to any of the other get away special payloads. That's one of the things, in order to be able to move these payloads onto the orbiter on our last minute space availble basis, it was important that we keep the orbiter interfaces to a minimum. And so the self contained nature of the program is very key in that regard. The only interface is bolting it into the orbiter and plugging this one connector in which provides for the three on off switches and those switches control relays in fact which can switch the power that's internal to the can. There is no power provided through those switches.

PAO Any other questions? All right. I understand there are no questions from Johnson or Marshall and thank you Jim and ask Bob Peterson and Todd Nelson to come up for the last part of the briefing.

PAO Okay. The insect in flight motion study experiment is to be conducted on STS-3 will be explained by Todd Nelson on the far left who's a senior from Rose Creek, Minnesota and Dr. Bob Peterson of Honeywell Space and Strategic Operations in Clear Water, Florida, which is Todd's corporate sponsor. Before they

begin their remarks I'd like to take a moment to explain how Todd became the first high school student to fly an experiment aboard the space shuttle. He's one of ten winners to the first Shuttle Student Involvement Project for Secondary Schools. Cosponsored with the National Science Teacher's Association, the purpose of the program is to stimulate the study of science and engineering by engaging students in a competition to develop experiments for flight aboard the shuttle. The ten NSTA regional directors received 1500 proposals for the first competition. Each region selected up to 20 semifinalist who, along with their teacher advisors, were invited to participate in Shuttle Conferences held at NASA field centers. All semifinalists proposals were submitted for national judging held in Washington D.C. The ten winners of the first year's program were announced in May of 1981. NASA then matched each student with a NASA consultant and corporate sponsor. The sponsor was asked to assist the student in turning the winning proposal into a flight ready experiment pay for the development and hardware costs and pay for necessary student travel. Todd is the first student to have his experiment conducted on the Shuttle because he and Honeywell were able to complete their work in time for integration into STS-3. The other nine winners from the first year of the project are currently working with their corporate sponsors and will be assigned to the upcoming flights as their experiments are completed and as space on the Shuttle is available. Additional information concerning the Shuttle Student Involvement Project can be found in the press kit, of course, and present in the audience and available to answer question following the press conference are Dr. Glenn Wilson, Acting Director of Academic Affairs Division, NASA Headquarters. Glenn are you here? Okay. Allen Ladwig, the Student Involvement Program Manager, Allen, are you here? Okay. And Dr. Don McCurty, past President of the National Science Teacher's Association and currently Chairman of the NSTA student activities committee. Okay. We, when we were down in Houston a couple of weeks ago, they were asking the astronauts about this project and they all showed up for the press conference with this fly swatter to indicate that they were going to take something along with them and from that developed, into the theory that there's a new system going to be onboard this mission called the ITS. Insect Termination System. So with that I will turn it over to Bob and Todd.

BOB PETERSON I guess you want to go over just a brief description of the experiment first as to what it is?

TODD NELSON Well, I guess that would nice. First of all I'd like to kind of comment on generally what I've been through first. The last time I was down here was at the National Space Shuttle Symposium and the other ten national winners were in the audience and we all kind of got together and gave our presentations here. And since then I have been working with Honeywell to develop this project and the main piece of hardware

is the flight chamber. And to do that is has required a large amount of effort on a number of people and Bob Molton has been in general the general integrator. He kind of corporates the entire procedures and then we have the project itself which is more or less in the final stages of development here. This is the final version of our flight chamber. And we could kind of go from there I guess.

BOB PETERSON I could give a little description of what's going to happen here. This, is this coming through all right? Okay. The title of the experiment is Insect Inflight Motion Study and really the purpose is to compare the flight behavior of three species is what we ended up with, and I'll explain what they are, in 0-g and 1-g. They'll be two aspects to the experiment. There'll be the 0-g testing which will occur in orbit on the fourth day of the flight and there'll be a 1-g test and we'll do it simultaneously as we can with that at JSC in the hi-fi middeck mockup. The insects have been split in half so we have the same groups of insects essentially from the same colony, from the same age group in each situation. The hardware that we built is this box, is the final version. There were three, this is the third version of the design that we came up with. Each one, each change that we made was toward less crew involvement. We're trying to minimize that. The, there are four units like this one. There is, this one is essentially a demonstration unit but it's identical to the other three. One of them is currently already is now in the bond room over in the ONC building. It will be the one that will go aboard the orbiter. Another one just like it is at JSC that we use in the middeck mock up and then there is one spare in case we finally damage one unpacking or have a problem with it. We don't anticipate any problems with them. There is two flight chambers in each of these boxes and what we will have is that's the A and B chamber. What we'll have in the A chamber our current plan and this is the way I think we'll be loading the insects 9:00 p.m. Sunday night is that we'll have 24 pupae that would be caterpillar moth adults in the A chamber plus 12 common house fly pupae which will hatch or emerge at about the day after launch. In the B chamber we'll have 12 worker bees and 12 male and 12 female, that will be in caterpillar pupae that emerge again like a day or two after launch. The idea being that we want to observe how they fly having only flown in 0-g never having flown in 1-g prior to launch and initially it started out to be let's compare the behavior and difference between 0 and 1-g but, there are other things that are kind of fall outs of this, some of which are can the insects in either the adult or pupa stage tolerate the launch ascent. Toleration levels, which should peak at about 3.3 g's. We're pretty confident that that won't bother them. Another question can the pupae emerge in orbit in a 0-g atmosphere. So that will be another question answered by it. The third one that he entomologists are interested in is the in the case of the velet bean caterpillar moths will be male and female will they

mate in orbit, will they reproduce, will there be any eggs in eggs in the chamber when it comes back for example or caterpillars.

TODD NELSON I'd like just to add that there is you know there's been a lot of interest among the scientists, especially the ones that are supplying the velvet bean moths for the fact that they may be mating and that's that shows that the project is really, it's a really neat project because it involves the students at with the high school level and that's pretty neat.

BOB PETERSON Something else that's neat, I guess I'd like to go on record, saying that we've had a lot of help from outside people, outside of Honeywell and outside of NASA and that are providing these insects and I'd like to go on record with showing appreciation for them. One is one group is Dr. Norm Lefla and Dick Guy at the US Department of Agriculture lab in Gainesville who are providing all the moths. Both adult and pupae. Another one is Mel Copeland, has Copeland Bee Farms in Arcadia, Texas, who is providing the bees for us. Mel is also a JSC employee. But, he's providing the bees as the Copeland Bee Farm not as a JSC employee. The third one is Dr. David Pemintel of Cornell University that is providing the fly puparea. This is all free of charge to us and these people are providing the insects in a controlled way so they know the age and try and give us insects that the fourth day of flight on the 25th they'll be at about their prime or prime flying capability.

TODD NELSON First of all, the reason the project is being carried out is because it's a basic research project and it really has never been performed before on earth and because gravity is such a hard factor to manipulate. So by, with that in mind this project here will provide a pretty good data on the insects and flight adjustments for a contiuous period in near 0-g. That's pretty important. Because from there we can kind of in the future have some data in particular on how the bee will adjust and that may be important. Because there could involve experimentation centering around the pollination of plants and with that in mind we think that with the project here and the data on that that would actually benefit them in other experimentation in that area so...

BOB PETERSON Well, one thing I had mentioned before was we changed the design of the box to reduce crew involvement. I could just briefly go over what the crew will be involved to do with that and currently this is scheduled for third day and seven hours five minutes after launch, MET of 3 days, 7 hours, 5 minutes. And I think that's scheduled to be at about 5:05 Eastern Standard Time on the 25th. What they'll do is the box will be in a locker in the middeck, they will remove it from the locker put it up on the forward surface of the airlock using velcro pads, from that point on take video tape recordings of the

(nsects in flight for however much time we can get them to do that. It doesn't have to be a continual filming. It can be interspersed with other activities. They could take some video tape, go about another task come back and take some more. What ever happens to be the best way for them to handle it. At the end of all this just restow the box back in the locker and that's the end of the experiment. Initially some of the designs require them to manipulate parts of the box, but it would have been a little more complicated for them would have taken them more time, but at the end of the experiment then, I guess the, I guess now the Shuttle will land at Northrup Strip probably on the 29th and may be a little longer delay getting it back to the Cape but we're expecting that there will be some time late April we'll see it again back here at KSC. We'll get the box off, the insects may or may not all be dead by that time. They can live long enough I think with the food we are providing so we might find some live ones in there. If we do, the entomologists are interested in getting a hold of them and examining them as well at the end of this experiment. I think that pretty well covers unless you have something Todd.

TODD NELSON Oh yeah, we could comment on the design and procedure and what we started out with. After I won the national competition, I was assigned Honeywell for a sponsor. With that in mind we took the idea that I had won, and that idea was taken (nd we sat down and had a brainstorm with that we come up with initial design flight chamber number 1. This is flight chamber number 3 and I can see along that design process there has been a number of things that have been worked out and with that in mind you can center on first of all the procedures of which the astronauts are required to perform. That's an operational goal to keep that down to a minimum level. And, first of all, there was on the first designs, we had moveable layer and that was designed to separate the insects the species from one another and to confine them and we had in the design number 2 we also had a canisters that would store the insects and after we did a little bit of investigation and experimentation, we determined that would not be necessary to take the velvet beans and the bees and place them in a container because that would require an additional amount of space that would take up volume of our flight area. And that was not very necessary and unwise. By reducing that canister we also increase the flight volume of the flight chamber and we also introduced a more practical design. Because with that, with those little canisters out of there. We had an extra area that could not fail. See part of the success of an experiment relies on the factors that are involved in it's performance. We don't want to rely on a large number of pulleys and mechanisms and nails and all kinds of movable parts. So you can see right here a very good example of the flight chamber that has been thoroughly developed and researched into the areas of (nimal astronaut activity. And this was very necessary because

to ensure the experiment, experimental success very simple procedures are necessary.

BOB PETERSON And everything we found with these canisters we had in the bottom they were little drawers you could pull the cover off and the insects would come up out of there. They're opaque and the dumb bugs would hide down inside there so you wouldn't often you wouldn't get all the bugs flying that you wanted to see so with this design there is no place to hide. We're going to see them even if they want to sit still. That's an important thing to find out too will they fly.

PAO Ready for question?

CARLOS BYARS Houston Chronicle You're using three different types of insects, is that correct? How are you dividing them up in areas A and B? Could you explain that?

BOB PETERSON What we're going to do is in chamber A there'll be 24 male velvet bean caterpillar moths, adults. Excuse me, 12 male 12 female of the velvet bean caterpillar moth adult. And the 12 fly pupae will be in that same chamber. Okay now in chamber B we'll have the 12 worker bees and 12 male and 12 female velvet caterpillar moth pupae. The reason we separated them that way is that if we ever see any moths flying in chamber B they will have had to emerge on orbit. So we've separated them so they don't their not in the same chamber as the adults. That's essentially the basic reason for the division. There'll be 36 insects in each side. But it will be moths and bees or moths and flys is the two combinations and they are, the word we get from the entomologists there is no problem with them being together they are not going to antagonize each other. They may stimulate each other to flight we hope.

MARK BENNING (garble) Engineer Todd I was wondering if you've decided where you are going to be going to college in the fall.

TODD NELSON I wouldn't mind going to the University of Minnesota.

BENNING Have you applied and been accepted any where yet?

TODD NELSON I've been so busy right now I have really considered....

REG TURNELL, BBC I should probably have understood this but, I didn't. Is it the position in the locker they will be kept in the dark and when they are brought out they will be exposed briefly to light and that's what you hope will make them fly and then will they be back in the dark again?

TODD NELSON That's correct. Light is one of the experimental factors. It's been a hypothesis of the research report light plays a major role in the orientation of an insect and just what effect that has in the absence of gravity we'll find out.

TURNELL And the other thing I didn't understand is quite one can see how interesting it is to know this, but how will it be of some benefit later on to have this knowledge?

TODD NELSON Well that's part of the reason it's being done or performed because it is a basic research project. And, with that in mind we can think of all the other things that have been learned from other basic research projects that weren't originally accepted or originally planned out. So this project here will you know generate a lot more interest in this area by being the first really continuous data provided on the Shuttle with the experimentation regarding the flight of the insects.

TURNELL How much is this a follow up to the experiment with the spiders on Skylab?

TODD NELSON The only catagory it would follow up into would be just under the biological area of life science. Dealing with life forms is one of the very interesting areas and the more knowledge we can get on life in general in the 0-g environment the better off we'll be.

JAMES WILKINSON BBC I like in thinking that there have been experiments before in which flys were flown in space. There have been previous experiments in which flying insects were flown in space, what happened then.

TODD NELSON First of all I'd like to know what the title was on the experiment of the other, what are you talking about?

JAMES WILKINSON BBC I don't know what the title of the experiment was but I believe there were experiments where fruit flys were flown in space. Either by the Russians or Americans I don't know which I can't remember.

PETERSON It seems to me the Russians did have a fruit fly experiment. I don't recall what the results were. I don't know of any we've done. The, Arabella of the spider that was a little somewhat different, but I don't know of any flying insect experiments in space that we've done as part of our space program. We may have I'm not I haven't been associated with the spacecraft flight control for about 20 years and I haven't paid too much attention to what some of the bug payloads may have been up to this point where I had to get involved and I've enjoyed it.

TODD NELSON Well with the fruit fly you have to keep in mind that the fruit fly is very small the size of a pin head and any

time you would observe this insect would be extremely difficult to get any good flight data it's such a small animal. I think they are probably concerned with not flight but more or less the mutations, maybe, of the fruit fly if it ever was performed.

JAMES WILKINSON If the bees and the moths don't fly when they are put on the wall, are the astronauts under any instructions to shake the box or give it a kick or anything?

TODD NELSON Well, yes. There would be (laughter).

JAY SHAYBARRO KSTP TV Todd can you tell us why these particular insects were chosen?

TODD NELSON Yes. The reason the criteria for selection of the insects centers around the source for one thing. We have to have a source that's willing to cooperate with us, to supply, to integrate insects in the control at Houston and in the experiment at Johnson, uh, Kennedy. That's important. And also, the insects physical dimension the wing loading and the actual type of flight control mechanism used by the insect. For instance, the fly has a halter gyro, it's a type of mechanism that works very similar to a gyro and it's in the evolutional history of the fly that has played a role in it's flight. A bee has a pair, two pair of wings and where as the fly has a single pair. And by studying those two insects, we'll be able to determine whether or not the fly which is a more highly sophisticated flight control system is more apt to maneuvering and surviving in the near 0-g environment.

PAO Are there any other question here? In the back there.

JOE CATCHOPAL US AIR FORCE I was kind of wondering about, this looks like it might be able to tie in also with the plants, because we mentioned about the plant before that it's in 0 gravity they grow without that much I guess that stuff that makes them stiff, ligament, anyway, so I was kind of wondering about if we have a group with space stations up there that would need, we'd have plants and stuff I was kind of wondering how we'd ever have to pollinate I mean the plants up there and if this works out I suppose we'd just probably use bees? Think that would work?

TODD NELSON Yeah that would be very helpful. Because, and with that in mind to be able to understand how those bees will react in the first place will be very important.

PAO Any other question here? Are there questions from the other centers?

PAO This is the Johnson Space Center. We have a question submitted by in writing by a Mr. Michel Goldman. This is the Johnson Space Center.

PAO There are no more questions.....(garble)

BOB PETERSON ...they may not do it intentionally but we may get a lot of maneuvers that we've never seen before and it should be interesting.

PAO ...next briefing is at 10:30 tomorrow morning.

END OF TAPE

HUGH HARRIS Good afternoon, I'm Hugh Harris at the Kennedy Space Center with the participants in the prelaunch press conference for the third launch of the Space Shuttle. Participating in the conference today is Major General James A. Abrahamson, Associate Administrator for the Space Transportation System from NASA Headquarters, Glynn Lunney, Manager of the Space Shuttle Program Office at the Johnson Space Center, George Page who is Director of Shuttle Operations, and the Launch Director for the Kennedy Space Center. Ken Kissen who is the OSS-1 Project Manager from the Goddard Space Flight Center and Dr. Craig Fisher who is the crew surgeon from Johnson Space Center and Captain Donald J. Green who is the Shuttle Weather Officer. And we'll begin with a brief statement from General Abrahamson.

GENERAL ABRAHAMSON Hello, this is my first launch obviously and the first time that I've been able to carry out this particular function in the NASA team and I've noticed that as you have all been concerned with this launch and previous launches, there have been a lot of questions about the machine and how well the machine is doing and that's very natural. I think however, it's probably worthwhile for you also to think about something that's very clear to me as one who's fortunate enough to be part of this overall team, that the Space Transportation System is made up of a very complex series or group of machines and backup machines and computers. But, the system itself is also made up of people. Thousands and thousands of people who work to make procedures work, to make repairs work, to make tests work, and I think it's worthwhile just remembering that those people are part of this effort and to date, on this particular launch as they have in the past in the development of the Shuttle, they're doing a magnificent job.

HUGH HARRIS Okay, thank you. Mr. Lunney.

GLYNN LUNNEY While we're in the final stages of getting ready to launch there are a couple of things the people are still working on but, they'll be resolved satisfactorily and I think we're ready to go.

HUGH HARRIS Thank you. George Page.

GEORGE PAGE I usually speak for the Launch Countdown phase of it and I'm sure you've already been briefed a half a dozen times, but it has gone very well to date. We're just now into the last built in hold prior to picking up the terminal count and except for one or two minor little cleanup things that we have to do everything has gone extremely well and right now we don't see any reason why we shouldn't be resuming the count on time and hopefully getting to a good liftoff at 10:00 tomorrow morning.

HUGH HARRIS Thank you. Mr. Kissen.

KEN KISSEN Well, I've been told as payload from the gentlemen on my left and my right that we're just going along for the ride. That once we do get up there, we're looking forward to a really successful flight and we're looking forward to it.

HUGH HARRIS Okay, thank you. Is Dr. Fisher here yet? Okay. We'll go on to Captain Green the Shuttle Weather Officer.

CAPTAIN GREEN The weather is looking real good. We'll have some stratus and fog in the morning hours again, visibility is occassionally down to 2 to 3 miles but by launch time we anticipate partly cloudy skies 6 miles and haze. Winds will be out of the southwest about 5 to 10 knots and temperature at launch time should in the low 80's. Looking at the landing site at Northrup Strip, Edwards and Rota Spain, they are all looking good. Scattered cloud conditions, visibility is unrestricted and surface winds less than 10 to 15 knots. In summary for the launch phases and for the contigency side, weather is looking good.

HUGH HARRIS Okay thank you very much. We're ready for questions. If you would raise your hand and standup when I call on you so that the mike handlers can find you expeditiously and if the mike handlers will wave to me if there is somebody in their area. If I don't call on you by name, please identify yourself and your organization and speak only in the mike. Okay. Right down here in the second row.

JAMIE MATHEWS CFCR Radio Is the fact that the external tank is going to be about 750 pounds lighter going to significantly change the look of the initial shuttle liftoff. Will it still rock back and forth and rock forward as it leaves the pad?

LUNNEY It should look exactly the same as the last couple.

PAGE You won't be able to use the same pictures you had before though.

PETER ADAMS TODAY Yes Sir. How does the weather at Edwards Air Force Base look at this point for a March 29th. Was it the right move to move to White Sands? Could you land at Edwards if you have to? Is there a possibility that Edwards could have been the primary landing strip? Looking at the weather at this point?

CAPTAIN GREEN It's difficult to predict the weather you know 8 or 10 days in advance it's probably going to be seasonal weather out there which would mean it would be okay for a landing. We fully expected the lake bed will be unusable for probably three or four maybe even longer, three or four weeks, or maybe even longer. We felt at the time as we prepared to decide what

landing strip to use that we had the right answer with Northrup Strip. That was before we got the indication that the lake bed was going to be out of service for four to six weeks as reported a few days ago. And we've thought that around the whole system with everybody and especially with the flight crew they're very comfortable that that's the correct decision and all of us are too.

JAY BARBAREE NBC For George Page. George have you an up to date assessment on the delay the landing at White Sands will cause for STS-4?

GEORGE PAGE I don't understand your question Jay.

JAY BARBAREE Well we're going into White Sands. Have you heard about that. It's all right. Is going to delay getting it back here I understand a few days. How long is the delay?

GEORGE PAGE Delay getting it back. We've laid out a schedule which is success oriented assumes no problems from the wind or the blowing gypsum out there. Does we ought to be able to get it back 9 days after we land. Which is about 3 days longer than it would have taken at Edwards. Probably optomistic but that's what we're working to.

HUGH HARRIS Right here Connie.

CARLOS BYARS Houston Chronicle One of the primary things that you want to do on the landing is get a crosswind landing. Is that, what are the possibilities for that on the, at the Northrup Strip. It seems like your prevailing winds there are out of the south and are you going to be able to get a crosswind landing there?

ABRAHAMSON The odds are probably pretty good. We have two runways out there, 17 and 23. And the winds are generally variable out there. At this time of the year we've got a pretty good chance at getting a decent set of conditions for the crosswind landing.

DAVE DOOLING Huntsville General Abrahamson has there been any feedback from military security at White Sands with the media about to descend into what has been hitherto a closed domain.

GENERAL ABRAHAMSON You've dropped out in part of that Dave. Actually yes, we've been working of course very closely with White Sands and you're not all going to be housed in Juarez, I understand. No, we will have arrangements so that people can be housed out but it will be a major security problem and we are not opening it to the general public at this time. We may have some difficulty in that but the military people at White Sands are concerned for their own security purposes, but also we're

concerned about the safety of the people just in the area. It's many many miles from any source of water or any conveniences at all and so we're only going to be able to only handle a limited number of people.

ED TOBIAS AP Radio The question was raised this morning about how concerned you are about the winds in the afternoon at White Sands. Are you concerned that they are a little gustier on the afternoon than earlier are you concerned enough to consider an earlier landing?

ABRAHAMSON Well we're presently planning to land out there at White Sands at 11:20 as I recall local time, which is usually before the winds pickup on the runway in the area. I guess my general reaction to that question though is given to a landing at that time of day, we think it's reasonably good bet we have two runways and we've learned to kind and wait and see what the weather is when we get there and then decide what we have to do, but it looks like we have the right kind of facilities out there with the two runways to take advantage of whatever situation we have and either get a crosswind or perhaps the autoland. With the MPLSS data all the way down to 300 feet on runway 17 if that were to make itself available.

JLES BERGMAN I though you'd never see me up here, Hugh. In the left bleachers. This is for Glynn Lunney. How important is it to NASA to get this launch off on time tomorrow and why?

GLYNN LUNNEY I think, Jules, we're always interested in launching on time if we can, more importantly than that we are interested in launching safely, so I think we are going to first apply all of our standards for being sure that we are ready to launch the vehicle. If that turns out to be tomorrow that's fine with us, we would like to make it on schedule, if it turns out tomorrow that we have to decide to wait a couple days, that's what we will do.

REGGIE TURNELL Two questions I think probably for Glynn Lunney. First of all do you intend to go on landing in the desert until you get a crosswind landing before you consider bringing it back here and secondly is there any plans to get the crew on this mission to monitor the Mt. St. Helens eruptions.

GLYNN LUNNEY With respect to the first question, we would like to get some data on crosswind landing before we come here to Cape Kennedy where we have the concrete runway and don't have the runout that we have availble to us in the desert. So in that sense, we have planned our first four flights rather conservatively in that we've opted to land in the area where we ve very long runways and relatively minimum sensitivity to landing conditions, over shoot, under shoot, or crosswind for that matter. We have a general rule that we want to get some

crosswind experience before we come here to the Cape and we have planned our order of priority that way to do that first if we can on this next flight. I think if circumstances were such that we weren't able to get exactly the crosswind landing that we had that we wanted to that that would not necessarily change our mind about where we might land want to land flight 5. We could still go forward and take a look at conditions as they would apply. First time we were going to come in here and decide how we felt about it and decide accordingly. The second question had to do with Mt. St. Helens. I don't know anything about that at the present time. Does anybody? Pretty far up I'm not sure that they'll really be able to see it very well though I can't comment on that vary knowledgably but,

BOB BIZZELL NBC This is a question for George Page. Based on your experience with the first two are you getting to a place where you think of these as routine or tell us how much more comfortable you are with this launch than you were with the last two.

GEORGE PAGE Well right at the present moment, I'm very comfortable. I always am you know aprehensive about the last five hours and then it narrows down to the last 31 seconds. I think regardless of how well the checkout goes, there are still awful lot of things that have to work right in the terminal part of the count. I think from the overall standpoint we've had an excellent flow in this vehicle. I think the crew is probably better rested. I'm talking about the launch crew now. Better rested than we have been before. We've had some days free days and from that standpoint I think we're probably in lot better shape than we have been.

JULES BERGMAN ABC This is for Glynn Lunney. It's a followup on my first question Glynn, but if any of the panel can take a crack at it. What I was really getting at was isn't NASA beginning to feel economic pressure because of the Arianne at an early phase in the test program. In other words, are test and operational programs becoming blurred?

GLYNN LUNNEY Well I say again with respect to answering the question, we will launch when we are satisfied it's safe. Right now we're satisfied tomorrow is safe. Pending any further developments that might occur. We are have been trying as you know and others know to move into what we would call an operations attitude perhaps with respect to the Shuttle. We've had all of two flights under our belt. The signs of the experience of those flights are beginning to show up in terms of what we are able to do here at the Cape and what we feel like we'll be able to do with the vehicle in flight and how we feel about it in terms of our confidence in the ship. So, we are moving as best we can into a set of operational attitudes about we can turn it around how we can fly it and how we can improve

it. I would view that as a somewhat natural flow of events. It's not unduly pressure, it's not unduly influenced by any external pressures such as economic ones with Arianne you mentioned. We feel that we're on course in the program that we laid out. We are pleased that in a number of areas it's going even a little better than we expect and we look forward to doing our best to make that continue to happen.

RON LOCKHART NEW YORK I'm trying to figure out whether or not when you get to the operational stage of the Shuttle now to extend on Mr. Bergman's question, when you're in the operational stages of the Shuttle and away from the experimental stages there is nothing to indicate that you would not move up the countdown if one was going very smoothly. If it did not have all the focus that is has for instance today and if you were not in the experimental stage. That once you got into the operational and normal usage of the Shuttle, you would consider moving up the countdown if it was going a smoothly as the last couple of days.

GEORGE PAGE I'll take a stab at that. Whether we're operational or experimental phase, we try to set the liftoff time compatible with what we think we have to do and the jobs we have. I would think when we get operational we'll be a little better able to determine exactly how long it's going to take and we will establish the launch time and date on the basis of what we know we have to do and we will probably be just you know able to make those without in the absence of any big problem so I don't think we'll be talking about moving up if we happen to be doing better. We'll know of ahead of time pretty well what it's going to take us to do it.

ABRAMHAMSON Can I add a prespective on this? Please? I think the context of your question was within the count itself and that's the way you were answering it, right George?

GEORGE PAGE Well I was answering not just the count no the count itself we probably would never move ahead unless there was some external situations that .....

PAO Wait a minute, we'll go back to you. Peter Adams from Today is next.

PETER ADAMS TODAY I presume this question is for Mr. Lunney. You're going to be out in White Sands for 9 days and obviously you don't have the same kind of protective facilities for the Orbiter that you would have at Edwards. What kind of contingencies are being laid out in case of some inclement or severe weather at White Sands and you don't have any place to put the orbiter?

GLEN LUNNEY Well we are providing some temporary facilities for people and equipment but you're right. We do not have a hangar

of sorts hangar of any kind to bring the orbiter into. We do think that that is not quite as bad as it might appear on the surface in terms of sand storms. You've heard a lot about this gypsum stuff, but it is not as heavy as sand and not susceptible to the same kind of damage that you might have if you have a sand storm in the desert. So, with that situation we feel like and the length of time that we're going to be out there, that we have a reasonably controlled environment, reasonably controlled situation in which we will have to get our job done and get the orbiter out as quickly as we reasonably can.

GEORGE ALEXANDER LA TIMES On the tail to sun and nose to sun portions of the flight. Are their temperature limits where if you got to that point before the end of the 24 hour or 80 hour soak period, you would consider taking the spacecraft out of that orientation rather than exceed a given temperature and if you do have temperature limits, what are they?

LUNNEY George, I don't know what all the temperature limits are however, we plan these tests with our thermal models on the asumption that we can indeed hold the attitude that long for those three periods of time and we will monitor in real time the response of the vehicle thermally to being in those attitudes for those periods of time and if we begin to see anything that gives us any concern, we will just backout of that and go on with the next test. I don't have particular limits that I have in mind. Let me just give you one example. There was a discussion at one time that if we stayed in a certain attitude a long time and got real cold, somebody might want to fire up an APU to keep it warm. Well, my conclusion would be that would be not an advisible thing to do for example and we would not do that. We would rather change the attitude or in some way change the thermal environment that the APU was in and not go to that kind of length to maintain the attitude.

REID COLLINS CBS NEWS Was any thought given in official NASA to moving up the count and launching earlier tomorrow. Was that ever a serious subject or a subject at all?

ABRAHAMSON Actually not. I think all of us felt that what we really wanted was we wanted a nice stable count one that afforded the crews, the launch crews in the entire system to have the, less stresses than we've had in the first two because that's the way we think we're going to have to operate, you know, on a long term repeatable basis. So there was never any serious consideration. Obviously there were, there was an option that was available to us but never any serious consideration about moving up the date.

OLLINS How about moving it up by an hour, not a day. At ...nite Sands.

ABRAMHAMSON No.

RON LOCKHART I wonder if you can give us a little background on Todd Nelson who was the student contest winner and whether his experiment is in place. We just had a second to talk with him and he seems very excited about it.

PAGE I think it goes in at T-8 hours. It's ready, it's here. And it is prepacked and ready to go in the part with the subjects in it if you will, I believe goes in at storage at T-8 hours.

ABRAMHAMSON I'd like to comment that on if I can I'm not in a position obviously to comment as George has about where we are in this particular experiment, but I hope all of you feel the same excitement that I do in that I think this is really an important adjunct to the Shuttle program and that it really, I've talked with several of these young people and they are sophisticated experimenters with a great deal of poise and I'm just delighted with the fact that we are going to be able to accelerate their experiments into the flight schedule.

MARY BUBB I wanted to know about since your delay of White Sands of getting the space ship back here, will that reflect on the date for the next flight?

PAGE ...question, will the late return of STS-3 effect STS-4. Was that the question Mary? We can't say that right now. I, we have not sat down yet or had the opportunity to sit down and lay out the STS-4 flow with the new return date. In fact we were still in the process of trying to firm up what we could do on STS-4. We're hoping we can still get in a late June time frame for launch.

ED SIDER SPACE 82 BOSTON I heard there was some possibility that thermal stresses on the external tank if there was an abort, are not bad enough to require the normal two day delay, wonder if there was any possibility if there was an abort tomorrow, that you would try going on Tuesday rather than waiting the normal two days to Wednesday.

PAGE We now have a 24 hour turn around capability. If the problem that caused us to turn around could be corrected or if it were something external to the vehicle yes we would try for the next day.

ROBERT TURNER ELIZABETHIAN NEWSPAPER I'd like to know should the White Sands facility be unavailable for landing on Monday do we have a contingency for landing the orbiter back here at the 'ennedy Space Center and what was involved in the area of the personnel.

LUNNEY We have two plans if I may. As you know we have an abort once around technique which is not targeted for Northrup. If we couldn't go there we'd probably retarget that for Edwards but we would know that in advance that that would presumably be a weather decision and we don't have any indication that that would be that would apply tomorrow. White Sands looks like it will be find for an AOA tomorrow. Now with respect to the rest of the time on orbit, we have a plan that says we're going to go to Northrup Strip and as a backup to that we have the runway the concrete runway at Edwards and we have the runway here. What we would decide to do in that case would be based primarily I think on the weather that we have in either place and the condition of the Edwards runway once you were to go off it. In otherwords we would like to think that we could use the concrete runway at Edwards and over run and be allowed to overrun it if it came to that. So, if the weather was the same we'd probably opt for the conservative thing. That is to go to the runway that we could overrun rather than the one here. However, our view of that entire situation is we got a number of options on it. It would depend on the weather the condition of the overrun out on Edwards the condition of the landing microwave landing system here and when we got through with all that we'd probably talk it over with the crew members too as to what they wanted to do in terms with what they're most comfortable with.

PAO Okay we're going to go to Johnson Space Center for questions there and then we'll come back here.

Gentlemen from Sky and Telescope.

This is Kelly Beedy from Sky and Telescope, a question for Ken Kissen, if you have to end the mission early and have to do it do what you have in four days which OSS payloads will be most adversely affected, especially the ones that require Top to Sun pointing?

KEN KISSEN I believe the high priority mission the four day mission that your referring to includes the full day to the sun orientation which would permit the solar oriented experiments to get there full share of the viewing opportunity. The thing that would suffer that we would do less with all of them, in fact probably the least affected would be the sun point experiments.

PAO Over here.

LEONARD DAVID National Space Institute, I guess for General Abrahamson. What changes if any to the SRBs and the aft skirt problem you had on the first two flights, I know that there was damage, is there any changes in the SRBs ?

ABRAHAMSON I think the question was, changes to the SRBs, let me see the only one I can think of right off hand is we did think about two inches off the skirt area in the preparation of the flight and inside the SRB inside the aft skirt area we have added some bracing material from beefing up because as you probably now know on the last couple of flights we've had some damage to the equipment in the aft skirt area on water impact and we're trying to beef it up back there to minimize the damage that we would sustain, that is not a flight issue, it's not a safety flight issue but it is more a matter of refurbishment and improving that the reuse of the SRB just as much as we possibly can.

PAO Okay coming back to the Kennedy Space Center Jules Bergman had his hand up I believe next.

JULES BERGMAN Glynn I'm still not quite clear on this cross wind landing subject. Must you get in a crosswind landing at Edwards or Northrup before the flight comes back here?

GLYNN LUNNEY I would say the answer to must we is no, we would like to get a crosswind landing in order to experience it, obviously we could come back here if we didn't have any crosswind at all, and it wouldn't even be a subject for discussion, so if we were not able to get a crosswind in the next couple of flights e would have to decide on how much of a crosswind we would be willing to tolerate down here, right now our rules are, I believe

ten knots but you know, as you know there's some reason to discuss that and it's just mostly at this point a matter of prudent program planning to try and get some experience with that before we come here.

JULES BERGMAN What I'm getting at, is the fifth flight is presently programmed or scheduled as I understand it, to land back here, it is the fifth flight, if you have a crosswind of twenty knots or twenty-five knots does that exceed the shuttles' capabilitity?

GLYNN LUNNEY I don't think its so much as exceeding the capaibility as it is being sure that we've had some experience that would give us confidence, if we don't get any crosswinds at all and we had that kind of condition facing us here we would probably and I am guessing at this point, but we'd probably have to reflect on what new experiences we had on STS-3 and 4 that would contribute to that but if we didn't have any we might be inclined to be conservative, that is and land on the lakebed.

MORTON DEAN, CBS If there is anything short of the minimum or priority mission how much will Fullerton or Lousma actually do on the way in, is the landing profile the same whether it's once around turn or two day mission or a three day mission.

GLYNN LUNNEY I would say for all intensive purposes, yes.

CRAIG CORVAULT, Aviation Week Glynn do you want to speak a moment to ascent risks from the standpoint of infant mortality so to speak on the SSMEs, the fact that you've been through two, is there any way to quantify how much more confidence you can place in the mains now that they've flown two missions?

GLYNN LUNNEY Well I guess its difficult to quatify that Craig, certainly having flown them twice is a confidence builder in using them again we have run a certification program as you know to qualifify these engines for this kind of use as part of the certification program we only permitted, well we applied the same kind of maintenance inspection procedures and replacement procedures that have applied to the engines here at the Cape so that in that sense we are flying them in a way such that they are in the same family of experience that we had during a fairly extensive certification program on these engines. The part times I should say, the times that we have on the parts in the engine is reviewed every flight they all look like they are comfortably within our experience, so we are fairly confident that these SSMEs are going to do that job for us and will continue to do that job for us for a number of more flights.

[illegible]O Gentlemen in the dark glasses.

Bob Gallagher from (garble) in New York, I've got a question here

I'm sorry Bob but we only accept ones from the newsmen here.

PAO first row

PRESS Based on what you know about the turnaround time what is the quickest you may get the shuttle to fly again?

PAGE Once we get it back here? I think we get it back in early April. We're talking for STS-4 now. What'd I say late June. That's two and a half months, something like that. Now that's you know based upon the mods we are aware of now that we have to do a minimum of problems in flight but somewhere around that time frame and that's without working every one of those days, that's keeping some open time.

ROB ZEA When do you see the turnaround time maybe getting around to about a month?

PAGE Getting down to what?

ZEA Maybe a month. or six weeks?

PAGE I still think that's a little ways off. We're going to get better each time and once we've got our full compliment of Orbiter's and full compliment of facilities at KSC we're going to be able to do a lot better and I wouldn't project a month's turnaround yet.

MARK KRAMER..CBS There was some talk this morning at the status briefing about unacceptable, or undesirable sun angle at the nominal landing time at White Sands and that was sighted as a possible reason for launching early. I understand you've knocked down the possibility of launching early, but there has been some other talk at other locations about high winds at that time of day at White Sands and I wonder if there is any consideration to coming down a rev early to solve both of those problems or avoid them?

PAGE Mark, let me correct something I happen to catch that morning briefing and one of my men was the guy you were asking those questions of and there was a misunderstanding there to start with. We had never talked about an early liftoff for any landing reason and I think as Glynn can explain the landing limitation at White Sands has to do with coming in on the 5th orbit and the amount of light, doesn't it Glenn?

PAGE There was a misunderstanding at that conference, I'm sorry it happened.

LUNNEY I guess I would say one other thing about coming down a rev early, if things go well we'll have a seven days here to look at the situation at White Sands and if it became clear that an hour and a half would substantially buy us some improvement in the landing conditions that we wanted to setup by way of winds or weather there at White Sands, we would certainly consider taking advantage of that but that's the subject that we can just wait and see during the course of the mission what the

conditions are up there. The difficulty with White Sands in that regard as a number of people have reported to me at least is that it's a fairly variable place, as a matter of fact, you can land in El Paso, it's beautiful, and then you may be weathered in and not be able to go to Northrup strip, and that's happened at Powell a number of times and it's kind of variable, so I think we have to be careful not to try to not run around and chase some uncertainty that probably will never go away on what the conditions are actually going to be when we land there but we will consider that during course of the flight and if it seems prudent to move it up to rev, so be it.

KRAMER That is it essentially the same position you've had on the previous 2 missions is it not?

PAO We'll only take a few more questions, now, over here.

DICK WESTON Star Foundation Question, has NASA considered going to Vienna for the Space International United Nations Space Conference and offering the same kind of student participation for the third world children?

ABRAHAMSON Right now we're in the 2nd selection phase of the secondary school experiment program. That phase will be over in May and we hope to select twenty US proposals. Frankly, I haven't thought of that and I'm not aware of maybe somebody else in the agency has and I'd think we'd have to think that through pretty carefully because there are other aspects of the program. For example, each student that is selected does have sponsors. He has sponsors within NASA, he also has sponsors industrial sponsor, who does provide some assistance to both financially and otherwise and I think those kinds of arrangements would have to be addressed if we were going to broaden the program.

In the upper row, here.

BRYAN HALLSCHEPSKY from Space City Two MIT Have you offered your launch crews any special private incentives to get STS-3 off on schedule and faster than 1 and 2?

PAGE I think the launch team we have out here is mature enough and dedicated enough we don't have to offer them incentives to do a good job. No we don't give them any extra incentive.

PETER ADAMS from Today Just have two brief questions. General Abrahamson, you had lunch today with the astronauts, any last minute feelings, any last minute advice they gave you or you gave them and also one other question, the robot being extremely important part of this mission testing grappling, testing its

ability to move an object through space, you weren't able to grapple on STS-2 and yet on STS-5 you've got to deploy some satellites, just how far back would you be pushed in terms of actual deployment of satellites for STS-5 if you couldn't do the arm exercise the next time around?

ABRAHAMSON On flight 5 we don't use the arm to deploy the satellites at all.

ABRAHAMSON Let me go back to the crew. I did not have lunch with either Jack or Gordy today, in fact, I was over there and we were having a discussion of the weather and how it is that we can in fact best understand and best make the decisions on the weather, not merely for this launch, but for the operational phase of the program. It's clear that Florida is a rather unstable weather area and as we look out in the future what we need is just the best possible way to in fact to be able to decide that we have acceptable conditions for launch and for return to launch site abort, those kinds of things. So that was the primary discussion and that was with a group of the astronauts, John and Joe Engle and others.

PAO Are there any additional questions? Ok, here in the second row.

PRESS As the Shuttle goes into its operational phase do you expect to ease up on the weather constraints for launch and landing or do you think they'll stay pretty much the same as we've had so far?

LUNNEY Well, they'll probably get a little bit easier, but again, I think we're going to go kinda slow on that. We certainly want have decent landing conditions here when we launch in case we have to RTLS. The range safety has some minimum limits by the way as you know here at the Cape. I think we'll I think we'll learn some things about that however, we'll probably still play that fairly conservatively as we go along especially since we will have during orbital phases the opportunity to go to another landing site or what has been discussed here move the landing time a little bit. When we get into the operational flight we will probably carry onboard enough supplies to go a day or two more than we normally would and if coming down a day early for really good weather got us out of some questionable condition the next day. I think we find ourselves trying to exercise that kind of flexibility.

PAO Ok, we'll have a final question here from the front row.

USS ROBINSON The Baltimore Sun Hugh, this question is probably for you, I've heard crowd estimates of everywhere from

half a million to a million and a half and I'm wondering what time I should get out here tomorrow. What are the latest crowd estimates and what does it look like?

PAO Well, the Civil Defense organization makes the crowd estimate and my understanding is that it is somewhere probably between 800,000 and a million would be watching in the center. I suggest that you get here well before daylight because I think that is the time we get the biggest traffic.

Thank you all for coming and we'll see you tomorrow at the launch.

END OF TAPE

Okay, let's get rolling here on a change of shift briefing with the offgoing Flight Director, Neal Hutchinson, going over the last 8 or 9 hours of STS-3. Neal.

Well there isn't really a lot to go over. We apparently as opposed to the last time out have really got a gem going here. We don't have any big anomalies. The vehicle's cooking real good, the crew is doing very well, and we got through all our afternoon and evening events without a hitch. The crew is running a little bit behind time some of the time but in general we executed everything we wanted to do today, I believe right down to the last INT. We got every single thing done in the flight plan that we planned on today and we're looking forward to a really busy schedule tomorrow. First thing in the morning we'll be taking the arm out and from then on for the next 5 or 6 days we expect to be extremely busy and there isn't anything going on in the vehicle that is going to prevent us from executing the flight plan as written that we know of. And I don't have anything else to say but that. I think that if anybody has got any questions we'll be glad to try and answer them.

(garble) let's go to questions. Do we have a mike handler tonight or are we just going to wing it? Okay, yeah, will you catch the gentleman over here.

PAUL FRENCH...VOICE OF AMERICA...Neal, about an hour ago, Jack Lousma told ally that he wasn't feeling too good earlier today but he was feeling fine at the time. Was he referring to the effects of weightlessness?

Yeah, I think Jack wasn't feeling too swift some of the time this afternoon and he's feeling a heck of a lot better now and we think (garble) he's going to be fine and he'll do a great job.

Did he take scopetec or something?

Yeah. Let's see...I think he took two, two scopetecs.

Is that normal to take these?

(garble) prescribed. Both of them took scopetec after launch.

They both did?

(garble) as laid out in the checklist.

Is there a chance that the ill effects can recur?

No.

(garble)

No.

Okay, next question. Anybody else? This might be the shortest

(garble) Erick.

ERICK ENGBERT...CBS NEWS... What can you tell us about what was discussed in the private medical conference.

Nothing. Nothing in particular that I think is...we had a standard private medicon today. What time was it Terry?

It was around 6:30, 7:00, something like that. I don't remember the elapsed time. Probably around, I don't know, 5 (garble)

And nothing extraordinary out of that.

How sick was he?

Oh, he wasn't sick at all. Jack I think (woozy garble). Yeah, he was slightly nauseated. He took 1 scopetex and he had a small amount of nausea just after he took his second. The scopetex were planned about 4 hours apart I believe and he had a good fluid intake and was feeling much better as the day wore on and by the time we got to this evening I think as he indicated on the airground just before he went to bed, he felt pretty much back to normal. I think the thing we gotta remember here is this kind of thing is something that we've seen before. Some guys are more susceptable than others. I think Jack...I think we all kind of expected we might have some small problem. I think it's over with, you'll never hear another thing about it, and I think you'll find tomorrow morning that Jack wakes up and is rip, ready, and raring to go. I think he was rip, ready, and raring to go tonight as a matter of fact if we would have wanted to keep talking, he would have kept right on jabbering along. I just don't think it's anything worth talking about.

Here in the second row, third row.

WALTER BAGLEY...ROITERS...Did Jack have a similar experience when he flew Skylab?

Yes.

So you kind of anticipated it because of his previous...

Well I think it's kind of hard to anticipate those kind of things but we and he certainly were aware that the potential was there for him to not feel too good for awhile. You've got to remember that...I don't have any ready statistics on it, but I'd guess that probably half the guys that have gone, early on in flight have had some feeling of fullness in their head and some uneasiness in their stomach and some of them react to it differently than others. The Skylab situation of course, we felt like the volume that was available to move around in had a lot to do with it, aggravated it because it was a lot easier to get a lot more motion. The Shuttle is a pretty good size vehicle too in terms as opposed to Apollo and but again I think you ought to be aware that none of us think this is going to have any effect whatsoever on the flight. It hasn't had any effect if you were listening to the air/ground

This afternoon, you noticed that Jack was always there and always working and always doing something and I think tomorrow you'll find him completely productive.

Any further questions here? Back over here to Voice of America.

On the checkout of APU Number 3, when may we expect this power unit possibly being checked out for use on ascent or descent rather? How many days into the flight?

Well, first off we haven't decided if we're going to do that yet and second off we have a normal procedure on the seventh day of the flight in the morning called FCS checkout where we exercise one of the APU's and we normally use Number 1, and it is possible that we could decide to use Number 3 instead for the express purpose of confirming what we all believe to be the fact and that is that it doesn't have a cooling problem and isn't going to have a cooling problem for entry and you'd just like to make absolutely positive it doesn't. I really think there's probably going to be a lot of conversation about that subject and I wouldn't look for us doing anything for several days, if at all.

Front row right here.

DAN BEAVERS...GULF COAST SCIENCE FICTION SOCIETY...There was some discussion debris on the nose area. Doesn't that being rather noticable, being ejected as described. Isn't that a little strange.

No, I don't think so. For one thing, Jack was describing where it was going. I don't remember the particular attitude we were flying at at the time. I'm not at all sure that it was coming from the nose. He was describing it as he looked out over the nose the direction the particles were going. As a matter of fact, I think one time I recall him saying something about a wing tip or it was coming up over the wing tip. There were some people in the Control Center speculating and that's all it is that very possibly when we went to tail sun, we still had some ice back there that was immediately being vaporized off and you were seeing some of that. All three of the previous two crews have reported a considerable amount of particle activity around the vehicle. Particularly early on after we get on orbit and ah...

Is this still early on?

Oh yes. Definitely. As a matter of fact, when Jack was doing some describing of what he was seeing there a couple of passes before he went to bed, Crippen was standing behind me and said that sounds just like the stuff we saw. No one's concerned about anything coming off the vehicle or anything like that. The RCS jets of course, the hypergolic reaction, one of the byproducts is some water. We probably...the water boilers probably aren't evaporating any water so the water boilers aren't going. But I don't think, there doesn't seem to be any concern anywhere about what it is. They are probably ice crystals.

Any further questions here?

Could you explain to us what's happening with your shift's lengths. This is a lot earlier than 12 midnight as we were told it was going to be.

He's got an early turnaround. He's coming back at 6:00 a.m. is it?

Yeah, that's not the least...When we got off an hour late, what we did was shift everybody's shift schedule one hour in terms of Central Daylight Time. I went on a little early today, so Tommy Holloway, the guy who was on before me could get out a little earlier and Harold Drawn relieved me a little earlier and I apologize for getting here too quick. But there wasn't a lot going on and this is a shift where my group comes back into Control Center. We are going to relieve the team who just relieved us so you know, we did it a little early. That's all.

Are the shifts going to be (garble)

No they will be very...once we get going in this, first couple of days we have a kind of a whifferdil that we do where a team has to leave the Control Center then come directly back in and the reason for that is so we always have a group of guys who are familiar with the entry available when we have entry opportunities and once we get into the sequence which happens basically at the end of the third day, we'll be repeating a very similar, all the briefings will be at the same time. Until then, you'll have to put up with a strange...for example, tomorrow and Wednesday I have 12 hour onconsole days. So the briefings are not uniform at the same time.

(garble) whifferdil

You want to explain that?

Lack of sleep. No it just means we aren't running a regular standard swing shift where one guy gets off and what I means is we get off and have to come right back again. That's my definition of a Whifferdil.

I'm convinced (garble) Anybody else? Erick.

One last thing. Can you walk us through the exercise of the RMS tomorrow?

In general, I could if I wanted to open the flight plan and go through a great amount of detail but basically we're going to power the arm up in the morning, we'll uncradle it, we will roll it outboard to its operating position and roll it back inboard to make sure we have all the motors required to roll the arm in and out. We're going to pick it up, of course, without anything on it. All the arm work tomorrow is what we call unloaded, no payloads onboard, very similar to what you saw in STS-2. The arm will be placed in certain positions and tested by moving it and then putting the brakes on while it's moving, and watching it stop, and making sure we gather

the data on the dampening characteristics of the arm. One test tomorrow, which is very similar to one we are going to do on Wednesday, with something on the arm, we're going to have it parked at a position and fire the big RCS jets to deliberately induce a vibration in the arm. We will grapple the IECM tomorrow, what that means is we'll put the arm on it and put the end effector on the grapple fixture and close the snares down, but then we'll just let the end effector loose. We're not going to pick anything up till Wednesday. We are going to check out backup mode to make sure we've got a full set of redundancy capabilities in the arm. That's a pretty good overview. The entire morning is devoted to armwork.

Okay. Anyone else? Okay, one last one up front here and then we're going to shut it down.

Why is there only one scheduled TV downlink? I see from our schedule here (garble)

You mean tomorrow during the day? I can't answer that. PAO TV requirements of course and TV requirements that we're doing for our own use are all preplanned and...I can tell you the general reason why. Whenever we are using the FM links to transmit television to the ground, we can't use them to dump data from the tape recorders and (garble) Oh yes, very definitely and that's what limits the amount of television we can provide and that whole plan has been coordinated. As a matter of fact, we are using the recorders absolutely filling them up and just barely staying ahead of the game the entire flight gathering data and that's exactly correct. It's a trade off between the digital data and the TV.

I think there will be plenty of TV over 7 days. Okay, thank you very much.

END OF TAPE

PAO This special briefing from the Johnson Space Center is being held to explain the loss of tiles we've had today on the orbiter. This is Tom Mosier, Deputy Manager of the Space Shuttle Orbiter Project Office here at the Johnson Space Center and we have passed out a statement to you. Tom, I guess you were responsible for writing it, and if you'd like to take over now with a statement then we'll answer questions.

TOM MOSIER Okay. Let me state first of all we have two regions on the vehicle where we have observed tiles missing. It's in the forward fuselage region of the orbiter just forward of the cabin. All these tiles that we see missing in that region which we've observed with the television camera from the Remote Manipulator System, the RMS, and from the crew description, is we have about, it looks like approximately 25 tiles missing in that region. I'll talk through that area and then I'll go to the other region. Temperatures based on predictions from STS-1 and STS-2 will range from, I'm talking about the tile surface temperatures now, that is the maximum, will range from about 400 degrees to about 800 degrees where we see these tiles missing. This is not a safety of flight because these tiles are missing, they are thin tiles. They are approximately 4/10 of an inch thick in the low temperature region and up to about 6/10 inch in the highest temperature region. Beneath each of these tiles and still remaining on the vehicle is the strain isolation pad commonly know as SIP. It's about .16 inch thick. It provides some protection to the aluminum structure and with that protection plus those temperatures we do not anticipate any problems. The other region of the vehicle we observed today from movie cameras from the launch pad, was during SSME, Space Shuttle Main Engine ignition, after ignition and up to approximately full thrust, it appears too right now. But, before SRB ignition, we can observe what appears to be some tiles which are being lost from the base region of the orbiter. It's either on the top of the body flap which is the most aft control surface or on the base heat shield of the orbiter. I think the thing that's most significant about this area, these are black tiles. They experience their highest heating during the ascent phase of the mission. Somewhere in the neighborhood of 12 to 1400 degrees maximum. The temperatures during entry back in this region are very benign. They are about 400 degrees maximum on the surface, and again, all the temperatures that I've given you today are surface temperatures of the tiles. We do not anticipate any problems with the flight because of losing these tiles. They've seen their high heating environment. I think that's probably a good synopsis of what we see today. We're continuing to map exactly where these tiles are located, correlate with some of the debris that we found around the pad. Make sure that we understand where these tiles are and that we have in fact seen all the tiles which we have missing. We can correlate with that.

PAO Okay, we'll start with questions here at JSC then

we'll go to the Cape. We'll start with Jules Bergman over here. Give your affiliation if I don't recognize you.

JULES BERGMAN ABC NEWS Tom, how can you be sure that no safety of flight issue that there are no black tiles missing from the leading edge or under the wings which do take the maximum heat when you don't have the wrist camera to examine them with.

TOM MOSIER Okay, that's a good question. There's a little bit more we know about this in the same film that we observed during liftoff. We can see the underside of the vehicle during the time which we lost these on the top of the body flap and the base region. Were clean there. All the tiles are in shape. Tiles on the high heating region of the body flap on the underside are all in place. As you saw from the TV pass with the RMS which inspected the top of the wings which would give us another indication that we are in fact in the more critical regions okay. Those two pieces of information give us the confidence that we need. The other thing that is primay interest in this is that as you perhaps recall from our experience in STS-1, where we went through the scenario of how we verified the integrity of these tiles, we put more emphasis on those tiles which are more critical. These tiles which we have seen missing today are the lesser critical tiles. We have pulled on the tiles, we proof loaded them, we densified those tiles which increases the strength of those tiles and it's attachment to the strain isolation pad by a factor of about 2 on the more critical tiles. Most all the tiles in the bottom of the vehicle are densified.

JULES BERGMAN So you're not concerned about there being any safety issue during reentry.

TOM MOSIER That's correct.

CRAIG COVAULT Aviation Week Tom, do you have any concern at all on the nose cap and have you given any consideration to maybe doing a 45 degree entry instead of a 40 degree entry to protect the top side of the nose a little more.

TOM MOSIER Craig, obviously we're looking at what all variables we have left for us to work with. Anything to minimize the heating there we will do and still keep the mission safe.

...followup. Does that mean you are seriously looking at a maybe a 45 degree entry and maybe also seriously looking at having them not do the PTIs and ASIs on the way down.

TOM MOSIER We're looking at all that. And I do not know what we're going to do right now. I think I would point out though if we continued if we flew this mission just like we did STS-2 we would have no problem. We'll do anything to add and I think the right way to say it, anything we can do to add margin, we will certainly consider. Now what else that does has to be considered

also.

MIKE TONER Miami Herald Some of the pictures this afternoon were coming from the elbow arm seemed to show in the area of black tiles just at the limits that you can see with the camera, there seem to be some voids there. Are you sure that those are not missing tiles.

TOM MOSIER Yeah, what we did on that is we have some photographs of the vehicle just prior to leaving the VAB and some that were taken thereafter what we correlated the black white tile configurations. Now I think the thing you're saying and I brought some photographs of that, we have some black tiles interspersed amongst the white tiles in that region and there is a sort of a sawtooth arrangement of black and white tiles down below where you see the tiles missing as far off the center line as we can see and we can see nothing other than above this about 800 degree isotherm.

ALLEN I'm still unclear what caused all this.

TOM MOSIER Well we're not really sure. We're going back. We're just now getting some of the data from liftoff. I think first off we would say that, left me back up one step, first thing we're doing is making sure that what we see there is not a safety flight issue we've convinced ourselves that. Our next step then is due to the detail investigation and understanding of what caused the failure. We're not there yet, we just gotten through that first and it's just conjecture as to what caused it. Anything, we flew it a little bit higher dynamic pressure, this time than we had on STS-1 and 2 which is part of the flight plan, progressively increasing in dynamic pressure. On STS-1 we saw a rather high overpressure from the SRBs. We didn't see it on STS-2. We did not see it on this mission. On STS-3. So, we're trying to get all the pieces of the data we can to put together the answer to that. We're just not there yet.

CARLOS BYERS Houston Chronicle Tom, you did a higher dynamic, you reached a higher dynamic pressure on the ascent stage and I believe you had planned a little more strenuous reentry on STS-3 than you had on STS-2. You say you'd be perfectly safe doing a reentry equivalent to STS-2. What about STS-3 reentry as planned.

TOM MOSIER No even STS-3 entry as planned we feel we're safe. No issue

PETER ADAMS GANNET Is there indication that there was an accumulation of ice on external tank before the mission began and there any indication that the external, this ice may have damaged the tiles on liftoff.

TOM MOSIER There is certainly that potential. We've viewed some of the films that we have here today. From the views that

we, from the film that we reviewed, we could not see any tiles striking the vehicle, but that is certainly a possibility, especially on that forward end of the vehicle. We feel like it's not appropriate or in anyway playing a role for the tiles that we see on the upper surface of the body flap and the [illegible] BASE HEATSHIELD region. But that certainly is a possibility on the tiles of the forward end of the vehicle.

VICK RATNER ABC You haven't indicated why you are so confident that the underside of the nose did not sustain debris damage during the initial moments of the liftoff.

TOM MOSIER Well, let me say the reason I say that is the rigor of installation and design of those tiles being greater than the lower temperature regions. Most all of those, well as a matter of fact, in the lower part of the forward fuselage on the underside as you say, all those tiles have a strength which is twice that of those which we've seen missing so far. Let me classify those two different tiles. The lower strength are the undensified tiles and those are the only ones that we've seen missing to date. The ones on the bottom of the vehicle and the forward end are all densified tiles. Densification just reflect on that for a second is the interface of the tile that is bonded to the strain isolation pad for the densified tiles we have essentially put a denser layer of fine silica particles in the tile itself which increases the local strength of the tile and that's the area that's most potential to be lost between, for an undensified tile. So in those more critical tiles we have densified those in the forward end and most of the under, complete underside of the vehicle has all densified tiles. Might further add that our next vehicle, all the tiles are densified.

ALL SHULSTED Baltimore Sun When you say stronger tiles, do you mean simply that they are densified or are they more securely pasted to the skin of the vehicle. Is there a better bonding there or is it just that they are stronger.

TOM MOSIER No, they let me step you through the layer of the thing. First of all there is the aluminum to which has bonded to it with a room temperature vulcanized rubber, RTV, the strain isolation pad or the SIP, and to that is bonded the tile. Okay. It's between and the SIP is a felt material. It has a nonuniform stiffness if you will, and the tile then an undensified tile bonded to it, if that tile SIP interface has got a lower strength than densified tile, or if you were to imagine a piece of aluminum with SIP and a tile bonded to it and you was pulling up on the tile itself, and you could take and just lift up on the tile, the undensified tile always fails at the SIP to tile interface. And it fails at an average stress about half that of a same densified tile. The tile materials are the same. It's like less than a 2/10 of an inch thick layer in the bottom of the tile that has the densification.

JULES BERGMAN Tom, you have indicated the possible causes of

this phenomena. It sounds like there might be two. Ice up forward maybe and vibration back by the body flap area.

TOM MOSIER That's that could very well be both of those. It's probably vibration in the aft region of the vehicle and perhaps ice in the front.

PAO Okay we're going to go to the Cape now for questions then we'll come back here.

DICK LEWIS Chicago Sun Times You indicated that there were 25 tiles or pieces of tiles from the nose, the white tiles that were knocked off. Do you have a number on the black tiles on the under body.

TOM MOSIER There is approximately 12 from what we've observed today. We're refining both of those numbers I might add. Those are the first cuts of them. I don't think there'll be any more than that, but that's an approximation.

DICK LEWIS Do some of the pieces that you found on the beach around the pad could they have been from previous flights.

TOM MOSIER I don't think so, we did the same inspection after the second flight as we're doing here and walk around the pad and we didn't see any problems of that type. We've correlated somewhat one of the tiles we found and it appears to be a tile that could have come from the region of the orbiter. BASE HEATSHIELD And I believe and I'm not positive I believe that there's a one of the white tiles that were found that was found had a number on it that was correlated to a one of the tiles missing on the forward fuselage region just behind the black line that goes all the way around the RCS module there.

DICK LEWIS One more question, are these temperatures you're giving us farenheit.

TOM MOSIER Yes, degrees farenneit on the temperatures.

HOWARD BENEDICT On STS-1 it was reported that you asked the Air Force to use one of it's military satellites to look at the base of the shuttle when there was some concern about the missing tiles, was that done in this case and another question, did you use either the Hawaii or Malibar camera to perhaps try to take a picture.

TOM MOSIER I'm not personally familiar with either of those activities so I can't answer the question. I do not have any data from any other source other than what I said.

PAO No additional questions at KSC

PAO Okay back here at JSC.

TONY MELISKY Canadian Broadcasting Corporation I have two questions. The first is what if any data do you not have as a result of not having the wrist camera and second, it seems to me that every time we have a flight now we have this same press conference obviously there is something wrong with the tiles and might be some thought given to redesigning them or is that not fair to say.

TOM MOSIER First of all we do have additional data from the ground. We have we're still looking at some of the film. We and that's our primary source of information. We're looking at it more closely to verify what we've seen todate. I don't believe we had this conference after STS-2. STS-1 we did. And are we redesigning, we're not redesigning per se, but we certainly are improving the strength and integrity of the tiles and that's the issue we're talking about here, is the strength integrity issue. We're improving the strength integrity of the tiles with the densification and that's the primary change that we are incorporated on the next vehicle.

TONY MELISKY Are you satisfied with the way the tiles are applied despite these failures.

TOM MOSIER Yes.

BILL WATTS KPRC RADIO Wanted to ask if the stuff that we saw coming off the tail in the previous TV pictures for the past hour does that have anything to do with the tiles or is that liquid or do you have any idea.

TOM MOSIER I really don't know. I haven't had the opportunity to see that myself. I've been off working this problem and I've heard that reported and I really can't comment on that.

PAO We'll have an explanation of that on the evening briefing when we have the shift change.

JAMES WALKER ABC NEWS Could you explain what is the effect of all the circuit breaker camera problems on the schedule of the astronauts.

TOM MOSIER I really cannot. I'm sorry.

PAO Let's keep this to the tile situation. At the shift briefing we'll be able to discuss some of those things.

JOHN VAN Chicago Tribune Is it likely that this tile problem will add significantly to the turnaround time before STS-4.

TOM MOSIER I don't envision it adding significantly. We have in our scheduled flow either the work on about 300 tiles I believe is planned. And what we've seen todate is far within that envelope and the reason we put 300, if we have, some of the tiles we have to remove for instrumentation reasons, other tiles

we are continuing to remove and densify as we have time between turnaround. Just to add that little additional margin. So I don't envision the tiles themself adding any significant time to the turn around.

CARLOS BYERS I'm curious, who first discovered this problem. Was it the astronauts looking out the window or did they look out the window, I know it's kind of a tight place I think they have to squeeze up into it to really look out at the nose like that, did they do that because you already discovered problems some pieces on the ground and said, hey guys maybe you better take a look.

TOM MOSIER No the first report was from the crew.

PAUL RECER AP Okay. Two questions. I just want to clarify something. You said film from the ground, film from the ground is a primary source of information, are you talking about the film taken from the launch pad or are their other sources of film.

significant time to the turnaround.

Carlos Myers

CARLOS MYERS I'm curious, who first discovered this problem. Was it the astronauts looking out the window or did they look out the window, I know it's kind of tight place they have to squeeze up into to really look out at the nose like that, they do that because you'd already discovered problems some pieces on the ground and said hey guys maybe you'd better take a look?

TOM No, the first report was from the crew.

PAUL REESE AP Okay, two questions. I just want to clarify something. You said film from the ground is your, I'm sorry, it's Paul Reese with AP, film from the ground is the primary source of information, are you talking about the film taken from the launch pad or are there other sources of film?

TOM No, I'm talking about the film taken from the launch pad.

PAUL REESE AP And you have no other sources of ground film?

TOM That's correct.

PAUL REESE AP Ok, and then the second question is, are any of these films that you've discovered are any of these tiles you've discovered missing the same tiles that came off in earlier flights? I mean, not the same tiles but the same tile location.

TOM The answer to that is no they're not. They're not from the same exact location as from previous flights. I might add that by virtue of the fact that in this, and to substantiate that, the tiles that have come off that we've seen and identified have all been undensified tiles. Anytime a tile is put back on the vehicle it's densified, so any of those things so any of the tiles that we repaired or replaced from previous flights would have been densified.

JULES one more time.

JULES

Tom, a numerical correction here. The release says 25 white tiles were pieces of tile missing. Now you've said 12 black tiles. Are we, therefore, to infer 37 or nearly 40 or what is the correct number?

TOM 25 white tiles on the forward end, 12 black tiles on the aft end.

JULES

So nearly 37 so it's 37.

TOM 37 total tiles.

JEES

37 total.

TOM Yes.

Question right here.

PAT DOLAN CABLE NEWS NETWORK Why not densify

Name please.

PAT DOLAN CABLE NEWS NETWORK Oh, I'm sorry. Pat Dolan with Cable News network. If the tiles that come off are then densified in the next turnaround period, why not densify all the tiles and eliminate the problem?

TOM Well, densification the additional margin enhancement with densification came into being, the process was developed after we had most of the tiles installed on the vehicles. We densified those tiles which were most critical. We densified those which were most highly stressed. The ones which were not densified were proof loaded to verify their strength integrity and in summary, they had adequate strength for any of the environments we expected to see based on analysis and ground tests for the full OFT program. So that's the reason for not densifying all of them. We thought we had an adequate or more than adequate situation. Follow up on this.

A follow up, okay.

PAT DOLAN Will you give further consideration now that this tile problem has reappeared to densifying all the tiles?

TOM We always consider any flight data and after all that's what this is a flight test program. We will certainly factor what we've learned from this flight back into those tiles which must be densified and that's the second part of this problem is understand fully what has happened here.

Okay, Peter Adams in the back.

PETER ADAMS Yes, did you do you have any significant tile loss in the RCS area and if so, is that does that pose any problem to the RCS, is there any concern for the for the reaction control system if there is tile damage there?

TOM No, there's the only tile damage in the RCS area is what you''ve seen. They were and there's no concern for the RCS itself.

ABC, here.

JAMES WALKER ABC James Walker with ABC. I have a tile question. How important is it to you to get the wrist camera to

work to take a look at the tiles under the belly underneath?

TOM Number 1, I don't know that we can do that. Number 2, I don't think you can reach around and see can see a small region and that would just add additional information to what we already have. But we're confident right now that we're ok.

JAMES WALKER Under the nose?

TOM Under the nose is yes. That's as I went back through before, those tiles have all been densified and more stringently controlled.

This gentleman here.

MIKE CONNER ROITERS Mike Conner from Roiters. Have you thought of a space walk by one of the astronauts to examine the unseen areas.

TOM No, that's not considered. We'll have time for a few more questions here.

Tom would like to get back, I'm sure. So let's wrap it up here with a couple of questions. Any more in this area here? This side?

TOM We have some pictures here, Okay, here's a question back here.

SAM ALLIS' TIME . Are the black tiles spread out, the lost black tiles, are they spread out in a large area or are they concentrated under one particular area under the body of the plane.

TOM Well, it was really hard to tell from the angle which we were viewing it but they appear to come from the same general area and whether they're all adjacent is hard to tell.

SAM ALLISON And that is under the main body of the Orbiter.

TOM No, it's at the very back end of the Orbiter but it's on the top of the body flap or on the base region of the Orbiter itself. Do we have a model, I'll point that out?

Yea. We had one here earlier.

TOM Our model is missing.

Tom brought some pictures along. They were taken from the TV pass but we only have two copies of these and you're supposed to take them back.

TOM Just one copy.

Can you use that?

I need a picture pointing out the missing tiles.

Let me use it if I can, Okay. Okay, I'll hold these here, Tom, if you want to.

TOM Hold it steady. Okay, these are, I'm going to have to see them. Pull back. Okay. This is the view looking down on top of the far fuselage, these are the windows, these are the upfiring RCS thrusters. What I've done there are some other black regions on the vehicle, some black tiles and other things, what I've done is circled the regions of missing tiles so you don't confuse those with some of these other things which are not missing tiles. Again, these are all up in the nose of the vehicle. Here are the ones again with the RCS thrusters. The ones down in this region, you can see are still well within the white region and are in the area of maximum temperature somewhere in the surface temperatures of about 800 degrees. As you move as you move up this is where you are reaching the 600 degree type of surface temperatures. 600 degree farenheit.

You want to show them.

TOM This is another photograph of the starboard side and you can see about the same type of pattern, a little bit off the center line between the windows and the nose and down on the side in the white tile region.

Wait for the microphone, here. Let's, we'll wind it up here with JULES Ok. JULES

What about the high speed cameras and launch pictures at Cape that showed the bodyflap tiles falling off? Do you have pictures of those?

TOM No, I do not JULES Just saw that film this afternoon so we haven't gotten any stills made up.

Tom, thank you very much. We have a change of shift briefing scheduled for 8:30. We'll try to have some copies of these photos for you in the morning for you. We just don't have any, have the way to do it tonight. So that completes this briefing.

END OF TAPE

STS-3 CHANGE OF SHIFT BRIEFING p9j GMT 83:21:15 PAGE 1

Good evening, thank you for waiting, we apologize for being late but it couldn't be helped. Change of shift briefing with flight director Neil Hutchinson, who's been heading out the silver team of flight controllers for the last 13, 14 hours, lost track, I think. And Dr. Sam Pool is chief of medical sciences division here at JSC. Neil, you want to give us a summary of the shift.

NEIL Yeah, I'm not going to try and go through a blow by blow account of the entire day. I would like to say that we think got an awful lot accomplished today. We did have a fair amount of problems as those of you have been paying attention to the air/ground as the day has gone on that ended up causing us to redo some things, and we're going to talk some about some of the things we are going to redo for tomorrow, and the following days. I don't have a complete picture of all the flight plan modifications, but I can give you a thumb nail sketch to give you an idea of what's going to be going on tomorrow. Before we do that, let me talk a little about today. As you're aware, we had some problems this morning with video equipment of all sorts, cameras, and film cameras and television cameras onboard the vehicle. We did get all of our RMS work done, our unloaded arm work done this morning with the exception of the grapple test which was a basically is going to get accomplished later on in the flight, and we'll talk about that in a little bit. The end effector grapple test was not done, it was the only RMS DTO this morning that we did not get accomplished. The only other thing, believe it or not, in all this fuss that you've been hearing today that we didn't get done was the CDR did not doff and donn, donn and doff his suit. And we are going to reschedule that for later in the flight. Other than that, we got everything done today that we set out to do; and most importantly we got the entire thermal tail, tail sun, cold soak completed. One of the failures that turned up this morning which was a camera in the right aft television camera, in the right aft part portion of the payload bay, known to us as camera C, failed early on this morning and that caused us to immediately first thing today begin thinking about flight plan modifications for tomorrow and insueing days. And in simple terms, at that point this morning the flight plan modificiations were going to consist of not deploying the IECM. And the reason for that is, really a couple of things. One, we need television cameras, one or the other of those aft cameras to be able to berth that payload because you can't see it from the back windows. And we had preflight decided that if we lost, we have two cameras, one in each corner and in the back and preflight we decided that we were not going to take the IECM out if we lost the camera. And, as a matter of fact we even been simulated that way a couple of times in some of the practice runs we made and sure enough we lost the C camera this morning, and it has a short in it. We attempted to repower it and the circuit breaker feeding the power to the camera will not stand, and we won't be using it for the rest of the flight. In any event, so we had decided this morning that we were not going

to deploy the IECM on STS-3, now he flies again on 4 so recall it the primary reason we were picking him up on this flight was that we needed, we desired the extra weight, he weighs about twice as much as the PDP. We desired the extra weight for the loaded arm test tomorrow morning. So about lunch time, that's where we were, we were working on a flight plan for tomorrow that involved the PDP only instead of picking the IECM up in the morning and the PDP in the afternoon. And then we got into our second camera problem, which turned out to be the one that caused us a considerable amount of concern and a lot of work in the control center, and that was the camera on the end effector. That's the camera on the end of the remote arm, also malfunctioned. Again it appears to be a short, the camera is inoperative, we tried to regain it and couldn't. That camera is the prime device that the crew uses for their remote eyes to put the end effector down on the grapple fixture to attach the arm to a payload. So we spent a fair amount of time today with a couple of crewmen in fact, Hank Hartsfield in particular. In one of our facilities here in JSC trying to determine whether, and we initially, common sense tells you probably could, but trying to make absolute certain that we could grapple and pick up successfully the PDP without any cameras. And we indeed have satisfied ourselves that we can do that. And so about the middle of the afternoon we started working on another flight deviation for tomorrow to not only to use, pick up the PDP, but to modify some of our procedures to go get it without any end effector camera. Now you heard, well we'll get into that later. Let met go on with the execution, so that's where we were this afternoon and we basically had a plan for tomorrow which picked up the PDP in the morning and I say had because I don't think we're going to be picking it up, and we'll talk about that in a little bit. We had a plan to pick up the PDP, used it for the loaded arm test pretty much as their flight planned in the morning and then kept it out and worked the PDP science in the afternoon. And as the day wore on, we had a test so we made lunch and went on about our business this afternoon. We had tonight scheduled the first of our payload bay door cycles which is a standard procedure that were using to gather test data on the door closing capability after we have stressed the system thermally, and as you know, we had been in tail sun some 20 or so hours by this time. Tonight and, I'm sure if you've been listening to the air/ground, you've heard the comings and goings of this episode so I won't go through it in great detail but the crew went through the door closing procedure. We could not get the port door completely closed; we got the door closed. We couldn't latch it. The aft bulkhead latches and we can talk about that in some detail if you want to ask questions. So we did the following, which was basically after talking about it awhile what we had planned on premission if this was to happen and that was we aborted the thermal attitude a couple of revs, or really a rev early. In other words, we left the tail sun attitude, turned the bay to the sun, warmed up the payload bay which includes the latch mechanisms and the door seals, and STS-

attempted to close the door again and as you just heard, indeed, it did close satisfactorily and all the indications are back to normal. The vehicle is now in passive thermal control attitude which is the barbeque mode perpendicular to the sun which is the planned attitude, that's where we planned to be at this point in the flight. The only discontinuity on our whole thermal profile that we incurred was the 15 or 20 minutes the top sun warming the payload bay up before we went into the barbeque attitude and we don't think that disturbed our thermal test or the recovery which, of course the PTC was designed to demonstrate was a recovery from the severe cold soak of the tail, or heat soak of the tail and cold soak of the bay. Along about this time late in the shift we also had a private medical conference and I'm going to let Sam talk about that but the crew is tired and neither one of them are still feeling real chipper and we have decided to back off on the flight plan tomorrow. We probably won't pick the PDP up, although that remains to be seen. We're going to let them sleep in. I'm going to sleep in I hope, at least for an hour and see if we can't get them a little bit more on track for tomorrow and I think that's kind of a thumb nail sketch of an awful busy but a very successful day. (garble) Sam, do you want to...

DR. POOL Just briefly, during our conversation with the rew this evening, they reported to us that they had had little sleep last night and the reason was that they were awakened several times by apparently noise in the headsets. Certainly it was not our plan to wake them up and I think in contrast to some times previous, we had a pretty good plan going, not to wake them up. Unfortunately, this did occur and the crew did not get a good night's rest last night and we've had a long day today. I think it's time to let them rest this evening. As Neil said, we're going to give them an extra hour of sleep in the morning.

HUTCHINSON Or more, we basically told them that we won't call you. You call us. They'll probably call us an hour early knowing Jack. Whatever.

DR. POOL As far as how they are feeling is concerned, I think they are very tired. They have not eaten a lot today. There could be a variety of reasons for that but basically I think they have had appropriate fluid intake and we're not much behind the power curve. With a good night's rest, I think we'll be back on track.

PAO Okay. We're ready for questions. If I don't call on you by name, please identify yourself. John Wilford, New York Times.

JOHN WILFORD...NEW YORK TIMES...Have you sent instructions up to the crew for tomorrow's procedures regarding the PDP? What are they?

HUTCHINSON The answer to that is kind of a partial yes John. As a matter of fact, I brought to me the teleprinter message. We did send up an overview of what we intended to do in the morning and of course we've kind of chatted with them off and on during the day about their feelings about picking the PDP up with no camera and they did concur in the initial assessment that we thought we could do it without any problem. We gave them an outline activities. This was prior to us deciding that we really didn't want to get into a real strenuous RMS job first thing in the morning and so we've got part of the plan, we've got a structure, an outline of the plan onboard. No detail procedures to go with it. Those were going to be generated through the night tonight and we probably will still generate them. I'm not sure we'll put them up because I don't believe we'll be picking up the PDP first thing in the morning. In fact, I can just about guarantee we won't.

WILFORD Well are you just going to grapple it? Are you going to actually pick it up?

HUTCHINSON Oh, no sir. We are going to go through pretty much the standard thing we planned on doing just as if we had had the camera. The one thing that's different is we're not going to the IECM first; we're going to grapple it and then we'll pick it up and then set it back down. We'll do a birth on birth test just like we planned with the IECM and then we're going to pick it up and run the standard set of loaded arm tests that we had planned for tomorrow morning. Not tomorrow morning. I keep saying that over and over again, but probably not tomorrow morning but we plan on doing exactly the same thing.

WILFORD But some time tomorrow.

HUTCHINSON I think what you'll ought to do is tune in tomorrow morning and see how we're doing. I wouldn't ...

WILFORD We want to sleep in too.

HUTCHINSON Well, I think you can safely do that and you won't miss anything before 8:00 o'clock or so.

JULES BERGMAN...ABC NEWS...Neil, I have two questions. One for you, one for Dr. Pool. Has there been diagnosis, any analysis of what the particles are flying around the spacecraft which we saw very vividly on the TV feeds this afternoon.

HUTCHINSON No, we still, you know everbody's got their own pet theory. We are absolutely positive we're not losing any consumables overboard. We've checked and rechecked to see whether we might have left a valve open in the main engine system that could be putting some residual propellant out in the form of ice crystals and believe that we don't have. We're still kind of

puzzled as to the source of that. I have talked to both, in fact, I've talked to Truly, Engle, and Crippen and all three of them say that that kind of phenomenon existed during their entire flights at some degree or another and their observations of the television pictures that we got this afternoon were "yeah, that looks like the same stuff that was coming out the general vicinity of the back of the bus when we were up there too".

BERGMAN Is that general stuff ice?

HUTCHINSON Jules, we really don't know. We really don't know and I don't know whether we'll be able to get any of it in the IECM. Of course, the contamination monitor is operative. It's in the bay and I don't know whether any of it's drifting around to the bay. It all looked to me like it had a fair velocity and was pretty much leaving the vicinity of the vehicle fairly rapidly. It's going into a different orbit than the vehicle's in, rather than just following it around. I don't know if we'll get a sample of it or not.

BERGMAN And for Dr. Pool. You say the crew didn't eat very much today.

DR. POOL That was the report.

BERGMAN Is Jack Lousma still nauseous?

DR. POOL No I don't think he's had much difficulty with that today. I think he's just not had much appetite and...

And in part, that may be due to the prophylactic medication that we're using, the dexadrine, which is a component of it. We're using scopolomine dexadrine tablet or combination drug and the dexadrine itself is somewhat of an appetite suppressant. So that doesn't alarm me.

MORTON DEAN...CBS...I

POOL I think tomorrow will be a better day.

DEAN Dr. Pool, to follow up on that. Did Gordon Fullerton suffer from any motion sickness whatsoever, and what was the reason why Commander Lousma decided he did not want to don the suit today. Did that have anything to do with his physical condition.

POOL I'll answer the second question first. I don't have any information as to why we did not don and doff the suit today.

HUTCHINSON Well, let me answer it. I think so MORT. I think it's fair to say that Jack didn't to get into any situation that

required a lot of body contortions which that has a tendency to do and the reason we didn't don and doff the suit today is because Jack said he didn't want to and we'll catch it later, and I think he's feeling a little better in the upset department and he just wants to make sure he continues on the same path he's on and doesn't want to incur any additional upset and that's just smart, good common sense.

POOL Yes as far as Fullerton's condition, I think he's very tired today. He has not reported to us any problems with the motion sickness.

PAO This gentleman up here in the front row.

JOHN VAN...CHICAGO TRIBUNE...Is there going to be any modification in the wearing of headsets and so forth so that these guys can get a decent sleep tonight?

HUTCHINSON Well John, we left that up to Jack. The configuration we slept in last night, was Jack had the headset on and was up in a seat in the cockpit. I think he probably slept in the left seat. Gordo was downstairs with the speaker box as his communications means. We told Jack that (garble) we have a speaker box, of course, and we told him he had the option to use that and I believe that the noise, it's just like as if you were listening to a stereo through a speaker with a set of headphones on. It has a tendency to be fairly concentrated if you've got a headset on. Jack, we gave him the option and asked him to please tell us before he went to bed tonight which he was going to choose and I suspect that since they are very tired that he's liable to use the speaker box. So that is one modification. Another modification we made, we are going to be recording the uplink tonight on our tape recorders and dumping to see if we can help isolate the source of the noise as whether it's in the orbiter or outside the orbiter, or where it is.

CRAIG COVAULT...AVIATION WEEK...One medical question and a couple of RMS? Did Jack vomit last night?

POOL We, as you know, have a discussion with them which is very very short and somewhat cryptic and I think most of you know that the symptoms of this malady, motion sickness in space, whatever it is, can lead to a variety of symptoms, some of which are fairly pronounced and some of which are fairly mild. I think the best way to answer that is to say the symptoms we discussed with him were not those that would make me think we were getting into major difficulty with motion sickness.

COVAULT Did Jack vomit?

HUTCHINSON See, he does this much better than I do. That's why he's here. Someone asked me last night, and I just said yes.

COVAULT Moving to the RMS, Neal to reaffirm what you said earlier, you do plan to get the loaded PDP, the loaded RMS test done with the PDP sometime in the mission.

HUTCHINSON Yes sir.

COVAULT And tomorrow, you do intend to pick up the PDP in the afternoon for the PDP science.

HUTCHINSON The answer to that is I'm not sure we're going to pick the PDP up tomorrow. I think a lot will depend on how the crew feels when they wake up in the morning. The message for tomorrow is that we really need to get the crew back on the straight and narrow here and get them to, not tired, eating reasonably well, and a totally functional part of tha airborne system because you just don't get productive work when they're not. We will not run the PDP for science prior to running the PDP for loaded arm.

COVAULT I understand.

HUTCHINSON The loaded arm work is higher priority and if we do pick it up tomorrow, we'll run the loaded arm first and if that's all we have time for, that's all we'll run. I might add that we haven't decided yet whether we'll put him away. We may just stay grappled to him for 2 or 3 days, depending on how difficult the grapple test is without the cameras. We think it's going to be fairly easy, and if it is, I suspect we'll put him away just like we normally would at night, ungrapple and tuck the arm away, and then pick him up again the next day. If it's not, we have a couple of options. Probably the one that's in most favor right now is to sleep with the arm attached to the payload but the payload birthed and latched.

COVAULT Okay. Have you given up on the DACs and the wrist camera?

HUTCHINSON We've given up on the wrist camera. I've heard that there are some procedures, when you say given up on the DACs, the DACs are, of course, about, you cycle a circuit breaker on and off is the extent of the troubleshooting capability there. I think it's fair to say that we probably won't doing much with the DACs. There are some folks talking about the possibility of trying to get them repowered tomorrow with circuit breaker cycling although I doubt it's going to do much good. I really think we probably lost them.

PAO Carlos Byars Houston Cronicle

CARLOS BYARS Neil, how about any changes due to the tile problem? Any thing developing along that line?

HUTCHINSON I don't know alot about the tile problem, I did read some of the briefing material, it was, it went on in the briefing we had earlier. The on console bunch is not participated in the tile analysis other than when we were asked of course the day, you know, we ran an extra RMS operation to survey as much as we could. That's really all I know about the tile. There are no, no flight plan modifications for tommorrow's activity, for sure that would have anything to do with the tiles. At least that I know about.

BYARS All on a different subject. What has become of that fly?

HUTCHINSON Well I'm sure he hasn't gone EVA. He's in there somewhere.

BYARS Has he been seen around the cabin?

HUTCHINSON You know we were so darn busy today, I really meant to find out and there were not a word one about him.

BYARS Gordon didn't smoosh him?

PAO Hal Selstad, Baltimore Sun

SELSTAD I didn't quite follow you on the closing on the, closing of the payload bay doors. Did turning the spacecraft toward the sun someway provide heat that solved this problem?

HUTCHINSON Yes we believe so. Yes we're sure. Yes it did. Let me explain a couple of things. We have a lot of data together about the mechanism of this thing, we took films of the door, we took measurements of the door when it was shut and wouldn't latch and all that stuff is going to have to come home and be diagnosed and run through computer programs and so on and so forth before we know the real mechanism of the problem. People suspect, the biggest suspect right now on the door are the door seals along the longeron and the stuff we call monkey fur if you have ever seen it, its the seal that goes up over the bulkheads, its, I don't know what the material is, but its about that long and it has a tendency to get very stiff when it gets cold and if it has any moisture in it, it litterly becomes an solid object. Now what we think, we had the door almost closed, the door was basically down, now the way these doors work, the door drive, drives the door 99% shut but the bulkhead latches actually pull it the rest of the way and if you ever saw one of these things when it was down and just compressing the seals, when the seals are perfectly pliable, the door drive motors don't have the capability to shove the door all the way down on the top of the bulkhead. And the latches, there are a gang of them, four of them on each bulkhead, when they operate and they operate all gang together, the latch closest to the hinge reaches its dog

first and its kinda going around and dogging a door in the old days it just pulls a little bit and a little bit and then the next one just pulls a little bit more. The door actually is bent down to conform to the bulkhead. Now when we got to stall current on the motors which was after about 15 seconds of driving those latches, stall meaning they wouldn't go any farther. We didn't have the door fully latch indications, we never did get them until we warmed the bay up. But we think the door was very very close to being latched. And the, like I said the theory is that we had some stiffness in those seals that were stiffer, we didn't expect, of course to have problems latching the door and that's one reason we're running these tests and when we went to top sun and put a little heat in the bay and started PTCing and about a half hour later they operated the door. Everything was absolutely normal.

PAO Right here in the second row.

Tony Lawski, CBC, three questions really. The first two are both on the cameras on the DACs. What do we know about why they failed. On the video cameras was there anything we learned from the failure of the elbow camera on STS-2 that might tell us why these two cameras this time went wrong, who made them and what do we know about that. And the third question was, what was the impact of the absence of the IECM experiment?

HUTCHINSON Well the camera question. I don't know who manufactured them. We did have a problem with one of the cameras on STS-2, we obviously have had some further problems with them which we didn't expect to have or we would have corrected them before we took off. I do know that we have a new solid, well let me back up, I know a few things about the camera. The cameras are basically cameras we, similiar to the one we used on the moon, infact I not sure they're not almost identical. They're not state of the arts, solid state, the very latest and greatest thing. We do have some new cameras which are in the program coming in way on down the road aways. They were scheduled to come in earlier but I think we moved them along down the road because of budgetary considerations. We're not sure why these guys are malfunctioned. We know that both of them have an electrical short of some sort in the camera itself that caused it to draw more current than its supposed to and its circuit breaker protected and they won't stay powered. We don't know whether temperature may have started the problem but the end result is that the temperatures, or the cameras cannot be powered.(garble)

LAWSKI And on the DACs and the IECM.

UTCHINSON I don't have really any knowledge of the DACs and why there not operating and we may have a temperature phenomena there too, of course they're all down in the bay and they were all getting very, very cold. That's another reason why we may

try them again. The IECM recalled it, the IECM was not being deployed for science purposes on this flight, it is riding on STS-4, they do have all of their science objectives already program on STS-4 and of course they would have liked to have gotten out here but we'd, just assume not go out since we don't have the redundency of the TV system and we do need the TV system to birth them as opposed to the PDP. You can't see the ICEM from the cockpit.

BERGMAN Neil it seems to me that we spent most of the day worrying about the tiles. And from we heard from the air to ground, so have you and the guys up there. Are you relaxed about the tiles now? Do you feel they're safe for reentry?

HUTCHINSON Quite frankly, I would choose to disagree with your statement just a tad, Jules. I haven't thought about the tiles one iota. And most of the people in the room over there haven't and I don't think the crew has either. We've been so busy working on this execute day from what I know and have been told about the tiles and I have talked to Tom Moser and I read his parts at least of his press conference with you folks, I think we're in, I would have the same personal feeling I had when we had this anomaly, or similar anomaly last time and that is that we're on, we're on safe ground here. It makes you a little uncomfortable here when things come off the vehicle but based on what we know about they are and the kind of temperatures they are going to see, all the best minds around here think we're on solid ground and I certainly don't disagree with that.

PAO Let's go to the second one on the back row there. Go ahead Jules.

BERGMAN When we saw Chris Kraft and General Abrahamson and Joe Engle all clustered around your desk around 5:30 in the MOCR. What was the subject?

HUTCHINSON You know I had a lot of people around my deck all day, I'm not sure I remember.

PAO We identified the subject on the loop and I believe the subject was the, you were discussing the procedures for grappling the PDP tommorrow. I'm pretty sure.

HUTCHINSON Oh yes. There was, infact we were talking about whether, one of the things we were talking about is whether we were going to do the science first versus the arm first and of course the scientist would like us to go do the science first and the arm guys want to go do the arm first. It was that kind of discussion, we were working on how to get this flight plan strung together for tommorrow.

PAO In the back row there.

try them again. The IECM recalled it, the IECM was not being deployed for science purposes on this flight, it is riding on STS-4, they do have all of their science objectives already program on STS-4 and of course they would have liked to have gotten out here but we'd, just assume not go out since we don't have the redundency of the TV system and we do need the TV system to birth them as opposed to the PDP. You can't see the ICEM from the cockpit.

BERGMAN Neil it seems to me that we spent most of the day worrying about the tiles. And from we heard from the air to ground, so have you and the guys up there. Are you relaxed about the tiles now? Do you feel they're safe for reentry?

HUTCHINSON Quite frankly, I would choose to disagree with your statement just a tad, Jules. I haven't thought about the tiles one iota. And most of the people in the room over there haven't and I don't think the crew has either. We've been so busy working on this execute day from what I know and have been told about the tiles and I have talked to Tom Moser and I read his parts at least of his press conference with you folks, I think we're in, I would have the same personal feeling I had when we had this anomaly, or similar anomaly last time and that is that we're on, we're on safe ground here. It makes you a little uncomfortable here when things come off the vehicle but based on what we know about they are and the kind of temperatures they are going to see, all the best minds around here think we're on solid ground and I certainly don't disagree with that.

PAO Let's go to the second one on the back row there. Go ahead Jules.

BERGMAN When we saw Chris Kraft and General Abrahamson and Joe Engle all clustered around your desk around 5:30 in the MOCR. What was the subject?

HUTCHINSON You know I had a lot of people around my deck all day, I'm not sure I remember.

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PAO In the back row there.

WAYNE DOLCHFINO...KTRH...We were told that no critical heat tiles were lost. There were reports on STS-1 that DOD satellites or some sophisticated equipment on the ground to get a better look at those critical areas. Has that been done or is there any plans to do that?

HUTCHINSON I don't know. I don't know that either. You know, I'm not trying to be smart. I really honestly don't know. I don't know of any plans to do anything like that and I don't, you know, the tile activity has just not been addressed by the online teams in the Control Center.

PAO Go ahead, Mark Kramer.

KRAMER Neil, can you talk a little bit about the latches. Did, I think there are 32 to 28, reach the fully closed position and did 1 gang of 4 not or did all of them remain open or what?

HUTCHINSON No. You're correct in the number and yes, only 4 of them did not get fully closed, and we think that of those 4, really probably only the last 2 on the outboard side toward the centerline were the ones that weren't completely all the way down. You know, as I explained, they're driven in a sequence. Remember that what we're doing here, is we're closing only 1 door and the idea is that we've been soaking the vehicle and we've had some distortion in the vehicle frame and two bulkheads, the 582 in the front, the 1307 in the back, twist a little bit relative to one another. Now the doors are very limber and they literally take the shape of that twist. Now, what we're doing is we're anchoring the door in the front and the back and then using the theodolite to measure that door distortion. So the only door that we latched down is the port door, and since we aren't bringing the other door down, the centerline latches don't come into play. Okay. So there were only 8 latches attempted. The forward and aft bulkhead on the port door and the 4, the one gang of latches that we had a problem with were the aft bulkhead.

KRAMER Can you quantify that a little bit? Does that mean that the door was jammed open, say a quarter of an inch beyond where it should have been, or was it a 16th of an inch or 4 inches, or characterize it some way if you can.

HUTCHINSON Well, we didn't ever get any visual report and we did get a verbal report from the crew and I think to quite them, "by golly, it looks like it's down to me", which means, and based on the amount of time the latches drove, we think that we were, I would characterize it in very small numbers only. It was down all the way up the bulkhead and probably, you know, an inch or ?. I really don't...I'm really not sure, but a very small amount up at the inboard side of the back of the door. We'll have some pictures. They took lots of TV of it and I'm sure it's

going to get dumped onto VTR and probably get a look at it before the flight's over.

KRAMER One final question remaining for that. If you were about to come back and you closed the doors and you got, say, 28 latches latched, and you had, say those 4 not completely latched, would that represent a safety hazard.

HUTCHINSON No, we have looked fairly carefully at the latch situation and we have, right now, a circumstance where we believe we could reenter without any one set of the bulkhead latches. Now the centerlines, we like to have all the centerlines made. In think if we had a problem with the centerlines, we'd have a real big debate about whether we needed to go outside and put the spare latches that we carry on the centerlines; but the bulkhead latches, we've pretty got it cleared to reenter without a set, 1 set of 4 of them not latched.

PAO We'll take one here in the 4th row. Right up here and then we'll go to KSC for questions.

PETER ADAMS...GANNET...Are you finding that looking at the payload bay door problem that Columbia has, doesn't stand up well to some of these thermal tolerances. Are you finding that some of these thermal tests are taking their toll a little more than one suspected?

HUTCHINSON No, I...well, obviously, it's more than we suspected, or we wouldn't have subjected the vehicle to a test where we couldn't close the payload bay doors, but that's what we're doing it for and I think we've gathered some very good information here about the doors perform and how the seals performed and recognize that we're going to turn right around tomorrow morning and start this whole thing all over again, cold soaking the bay, and not as bad as this last attitude, but it is going to start getting cold again and during the 80 hour nose sun, we're going to check those doors several times and with the same intent, to try and understand how the structure is performing. I wouldn't say it's...I think we were a little surprised...one thing that you should be very aware of though, the reason the door didn't unlatch was not that the structure had deformed in any way, shape, or form thermally; it was...everyone really believes that we had a seal problem. One good piece of evidence that tells you that is that we got out of it very quickly. If it had been the structure, in other words, we had actually twisted those 2 bulkheads relative to one another, it would have taken us a long time, quite a bit of PTC to get ourselves in a position where that door would close properly. So we've probably learned something about the seals and I don't think...the bottom line answer to your question is I don't think we're learning that the vehicle's behaving, misbehaving. We're just learning how it behaves.

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PAO Okay, we'll go to Kennedy Space Center for questions.

PAO This is Kennedy Space Center. We have a couple for you.

MARK BLUME...MEDICAL WORLD NEWS...A couple of questions for Dr. Pool. Could you say Dr. Pool, when or if the astronauts took the scopolomine dextro amphetimine tablets or if indeed it was prophylactic and what the dosage was?

POOL Yes. They took scopolomine dexadrine. The dexadrine is 5 mg and the scopolomine is 0.4 mg. It's a combination tablet. They took the first shortly after OMS 1 burn which is something like 20 minutes into the mission. They then had the option, based on their own feeling about their symptoms, to take additional medication. We recommend they not do that any more often than about 4 hours. I think on the first day we ended up taking it about 3 times and I think about the same thing today.

BLUME Is that both crewmen took it 3 times the first day and today, or just Lousma.

BLUME Yes, and it was taken prophylactically. I forgot that part of the question. That is a prophylactic regimine.

BLUME Both crewmen prophylatically?

POOL That's correct.

BLUME Both crewmen 3 times yesterday and 3 times today?

POOL I believe that's correct.

BLUME Okay. Now, in view of the fact that Lousma had a similar upheaval on Skylab, the question is, why didn't you try the scopolomine transdermal patch for him this time?

POOL We had some laboratory data provactive test data which was done here which indicated that the scopolomine dexadrine combination was much more effective than the transdermal scopolomine patch alone, and that's not uncommon. We run these sorts of tests on our crewmen preflight to try to attempt to optimize the medication to the crewmen.

BLUME Just to follow up this one bit. I believe Lousma took the scopedex on the previous flight or on the Skylab flight and had his problem or was he one of the men on Skylab who did not take it prophylatically and then have the trouble?

POOL As I recall a scenario on Skylab, it went something

(ike this. He took it prophylatically, but then waited some considerable time before he elected to take it again and in the interim he had some difficulty.

PAO No further questions from KSC. I'm sorry. One more (garble).

LINDY WADSWORTH...WUOM...Back on the topic of the particles that are visible outside the shuttle. Are these visible all the time or only in certain periods, or relative locations, and do they appear to be related in any way to the particles that Glenn and Carpenter and possibly some other astronauts had seen previously.

HUTCHINSON Well, to answer your first question, or answer your second question, I'm sorry, first. Since we don't know what they're made of, I think it's kind of, it's purely speculative, obviously, I mean to try and relate them to something happened in Mercury or Gemini or any other program for that matter. In terms of their visibility, they seem to be there all the time; however, they're most visible when sun angles are proper such that the sun,...the particle is between the sun and the observer and that obviously occurs around sunrise. And of course, it depends on the attitude you're flying, but they seem to be when illuminated against a fairly dark sky, fairly obvious. At other times, they're not so clearly seen.

PAO Mark Blume

BLUME Yes. Was there a provocative test on Astronaut Fullerton as well indicating that the scopolomine transdermal patch was not as effective as scopedex.

POOL That's correct.

BLUME One further question. Why is Fullerton continuing to take the scopedex on the second day (garble) that Lousma's condition is a touch contagious?

POOL Like anybody that's been in that situation could say it could be a little contagious. I'm not sure. It was our plan going into the mission to administer these drugs prophylatically and quite honestly I'm a little bit sketchy about Fullerton's medication profile today. We tried to make sure Neil had plenty of time to ask some other questions so we did attempt to minimize the amount of time we talked with the crew today.

PAO Any more questions?

PAO Okay. Let's come back to JSC for a few more q' stions. Let's get this gentleman over here. He hasn't had an o, portunity yet.

JOHN BISNEY...RKO...Am I correct in (garble) hear you say you've not nailed down the activities for tomorrow yet?

HUTCHINSON Yeah, that's a good way to put it. Yes, we have told the crew that we'd like to get up late and take it real easy in the morning and (garble)

BISNEY (garble) idea at all of what might happen tomorrow in even general terms?

HUTCHINSON Well, I think there are some cabin activities that very well could take place. I'm sure we'll do things like EEVT samples and non-high concentrative tasks in the morning and I think it all depends really on how well the crew feels. If we can mutually agree that they want to take off again on a fairly riugorous schedule, we probably will go to work on the PDP with the arm later on in the day, but it's a fair assumption, I think, that we probably won't be doing any arm work in the morning.

CARLO BRYARS...HOUSTON CHRONICLE...A couple of questions, the first one will be either for you Neil or for Dr. Pool. Lousma did get in at least one session of work with the electrophoresis experiment. I believe you made a comment that it seemed to be working well. Could you perhaps amplify on that a little bit?

....transmissions about obtaining some desirable stereo pairs of a Mexico site, I'm just wondering what that was in reference to.

HUTCHINSON On the latter question, didn't hear, I don't hear every word that goes up, but almost, and I don't recall that conversation at all. That happened on my shift, I'm real surprised.

BYARS I might be mistaken about the shift now.

HUTCHINGSON Yeah, and so I don't know Carlos, about that. The electrophoresis, we got started late but we did get, in fact, I'm not sure we hadn't determined when we left there but I believe we got two samples done today. The first one, which was the red blood cell operation, as far as I know went fairly well, and I'm certainly not a scientist. And I think probably you know you got to wait till you get these things back, there cryogenicly frozen and then they need to be examined fairly carefully to see how it went. But procedurally and in terms of the execution and the things that the equipment supposed to do and the crews interface with it it seems to be going very well. And of course we got a lot more of those to go you know. We got, I believe we have 8 samples aboard and we'll probably get to all of them before we get home in a week.

PAO Right back there.

PETER LARSON Orlando Sentinal Star: Two quick questions; how would you characterize or how have the astronauts characterized this nocturnal radio interference? And secondly, is it true that Lousma has been taking pretty much only liquids today?

HUTCHINSON Well I'll answer the first one. It's a static in a radio system in your air and it's loud enough wake you up from what probably isn't a very deep sleep, but what certainly is sleep and Sam can...

Dr. POOL Ok, both crewmen have reported eating today, but not very much. And they both reported that they've taken onboard quite a lot of fluids and we're pleased with that.

PAO Kay Ebeling

KAY EBELING With Lake Publishing Newspapers: What kind of activity takes place on the ground here at Johnson Space Center during the activation of the electrophoresis experiments onboard the spacecraft. In other words how many people are involved what are they doing here on the ground in support of that.

HUTCHINSON Well you're going to embarass me Kay, because I can't, we have a PI here and of course we have some, Sam may know more about this since it's on the medical side of the house, but we have the folks who built the experiment and I don't know, are we running a ground model.

POOL No, we did our ground, baseline studies but not being done during flight, those are done preflight. We have some very interested principal investigators who hand on every word, I think, the crew gives us.

KAY EBELING Ok, but they don't conduct any activity themselves that's integrated with the experiment.

POOL No.

KAY EBELING Ok.

HUTCHINSON No, they are in the control center, though, continually humming about things that are being reported back and forth between the crew and us and asking us to ask the crew things that so and so were, they're very active in the actual operation in terms of gathering information.

POOL There's been a tremendous amount of work done on the ground on leading up to this as well and there'll be some after the flight.

PAO Ok, let's take one here and then we'll get Pete Bulban up here next.

JOHN PINER, REUTERS, Last night, in addition to the headset noise, the crew complained temperature fluctuations in the cabin, what was that about?

HUTCHINSON Well, a couple of things, the situation we were in last night, first off, when you first get on orbit the vehicle takes a while to get to an ambient temperature, in other words the temperature, it's going to stabalize at without doing anything to the control to raise or lower it. And as we've discovered in the STS-1 and 2 that usually takes, oh, 10 or 15 hours. As we've also discovered in STS-1 and 2 when metabolic activity and TVs goes down at night and the TVs get turned off and so on and so forth the cabin has a tendency to cool off some. And you'll recall on STS-1 we had some problems with the crew being very cold the first night. On STS-2 we thought we had that pretty well whipped. And on this flight, since we were going into the cold attitude, in other words the an attitude, you remember last night was when we first started the tail sun, we didn't have a chance to see how the cabin was react to that but we anticipated that was going to cool off quite a bit. Now we had some standard procedures that are used to add heat to the cabin air. And we recommended guessing on what the cabin, how the cabin was going to respond to tail sun that the crew do a couple of things. One of them was to pin the cabin heat air interchanger full air full hot, which puts the minimum amount of air through the heat exchanger taking heat out of the cabin. And secondly we told them to misbalance that heat exchanger so a disappropriate amount, it was inefficient. It turned out that we led the problem a little bit to quickly and the cabin warmed up before the thermal effect of tail sun could cool it down and the crew got uncomfortable. So they took the heat exchanger back to normal efficiency, if I could put it in those terms, and then sure enough several hours later the cabin started to cool off like we thought it was going to and they got cold and had to change it again. It's kind of like setting the thermostat in your house and not being quite sure whether the sun is shining or not. It takes you a while to home in on an answer. I don't think we'll have any problem tonight. The reason I don't is because we're in passive thermal control and the cabin's pretty well stabalized now and I think they'll be comfortable.

BULBAN Dr., were you able to determine just how much sleep Lousma got last night?

POOL Only the crew report.

BULBAN And did they say how much sleep they got?

POOL Very little sleep. We didn't take the time to (arble)

BULBAN You didn't qualify it?

POOL No.

PAO Okay. We've going (garble) we'll take one more. We've been going almost an hour now.

PRESS Just one final question Mr. Hutchinson. Was any change in procedure in the PDP testing either tomorrow or later in the flight. Will the crew's role and that, as a result of the camera malfunction, will the crew's role be incrased in any way, and will be there be any change in the crew's role with the failing wrist camera.

HUTCHINSON Obviously, the crew's role in initially getting to the point where you picked the device up is increased by the fact that they are having to use cues, visual cues from a non-optimum camera source. We've actually given them some initial conditions to place the arm fairly precisely over the top of the grapple fixture. This one has got the grapple fixture sticking straight up in the minus Z direction up towards the tail, so they'll be going to that position just by dialing in some numbers and driving the arm there. Then they are going to have to depend on their judgement and the cameras we have which don't include, of course, the cameras looking right down on top of it to go down and grapple the payload. Now, once it's grappled, the day looks pretty much the same. The auto trajectories are run, the picking it up to the loaded arm positions and firing the primary RCS jets and all those kind of tests are all going to look just about the same, so the crew's involvement in that would be exactly the same as it was without the malfunctions. So the big deal is getting hooked on.

PRESS Will they actually look out the window and do any observation. Will they (garble)

HUTCHINSON That's how they're going to drive it down on top of the...a lot of it will be out the window and some of it will be using the TV cameras that we have left and some of it will be using numbers displayed to them from the RMS joint angles and position readouts.

PAO Okay. We'll say goodnight now. Thank you.

END OF TAPE

STS-3 CHANGE OF SHIFT p10j 9:30 am CST DATE 3/24/82 PAGE 1

PAO Good morning and welcome to the Change of Shift Briefing. I'm sure you recognize Tommy Holloway who was Flight Director during ascent and is fresh out of the MOCR after having spent the past 14 hours in there and has the privilege of going back in there at 6:00 this evening again. I'll let Tommy start off with a summary of his shift and then invite questions. Tommy.

TOMMY HOLLOWAY Well first of all the shift, I'm not sure I'm fresh out of anything, right now I'm about to run out of steam. The shift that the ascent team participated in was a very normal shift and with only a couple of additional what we would consider in terms of flying flight 3 minor failures which maybe worked out before the day is over and I'll get to those in just a minute. As you probably know we have restructed the flight plan very slightly for the next two days to provide a little better opportunity for the crew to catch up on their sleep and eating. Yesterday as Mr. Hutchinson no doubt briefed you we had a problem with the payload bay doors that kept the crew busy, additionally busy. They already had a busy plan working on ascertaining that we had a good condition with the payload bay doors, and as a result of that and along with the additional fact that they were not feeling quite as well we'd like for them too, we elected to give them the opportunity to sleep a little late this morning and make up for being kept up late last night. Although, we stopped talking to them on schedule last night I'm confident that they had another hour hour and a half of work to do before they could really go to bed so we've restructured the plan and are flying flight day four today and are planning on executing flight day 3 on flight day four. So, in general you can trade those two days and we'll be accomplishing those activities that are in your crew activity plan on flight day 4 on flight day 3. And most of the activities on flight day 3 we will accomplish on flight day 4. This morning we did ..in the morning we did experience a failure of the commode as you may have heard on the air to ground. We are hopeful that that situation will be remedied and some malfunction procedures that are currently being worked on and the crew has part of them in place already. The second significant thing or thing that of least of interest that has happened in the last 24 hours is that for a period of time we experienced what appeared to be a one or two one and a half pound per hour GN2 leak out of the GN2 that is used for the to maintain the cabin pressure in the orbiter. There is a great deal of margin in the quantities that are required to support the cabin pressure during the flight and in fact, most of the GN2 that's onboard the orbiter some 200 odd pounds is used is on board for the possibility that the orbiter develops a leak at some time and of course of having flown it for these some three days, we would not expect to develop a cabin leak at this time. So, back to the GN2 eak. It leaked for a while and then it appears to have stopped. Now, that could be caused by a couple of things. It could be an unusual thermal situation that's going on in the

orbiter that's faking us out and instrumentation is not really correct and we may not even have a leak. And Mr. Hutchinson is struggling with that now and trying to understand it. Or, it may indeed be a leak, that remains to be seen, but we still have malfunction procedures that we can do to isolate the leak and in fact with the present leak if it indeed was leaking and did reoccur we would expect to be able to fly the full duration and I think that's about it for openers and we'll let you ask any questions.

PAO Okay, let's begin with questions here at Johnson Space Center. Please wait for the microphone and identify yourself with your name and affiliation.

CRAIG COVAULT Aviation Week Tommy, would you review your RMS for today and your outlook for RMS tomorrow a little more specifically.

TOMMY HOLLOWAY Okay, today we're doing the activities that are on flight day 4 and the RMS that involves doing a thermal test basically. We are not unberthing any payloads today although they originally there was one unberthing of the PDP as kind of a piggy back operation to the thermal testing. The purpose of the basic day to day is to determine how the arm will operate and react to not having the heaters on. So, we're basically going to put the arm out along the longeron operate the heaters for four hours then turn the heaters off for a couple of hours and see how the temperatures react then orient the arm in a Z direction, that's straight up relative to the orbiter and operate the heaters for four hours to achieve some stability on the thermal situation then turn the heaters off for two more hours and see what happens and tomorrow with the exception of the IECM operation which you've probably already been briefed that we have under the camera situations we're in right now, we're no go to grapple and unberth the IECM, but we do expect to be able to grapple the PDP and do all of the science operations associated with the PDP tomorrow.

MARK KRAMER CBS Regarding the arm. There'll be no grappling at all today. Is that correct.

TOMMY HOLLOWAY That's correct.

DAVE DOOLING Huntsville Times Just what is it that has gone wrong with the cameras. Is it inside the cameras, is it the circuit breakers, do you have an idea what it is if it is inside the cameras.

TOMMY HOLLOWAY Well, camera C has a short, electrical short that is popping it's circuit breaker somewhere and I don't think we know where. Probably require some postflight work before we know. (That's the aft starboard side) Yes. Camera C, thanks for helping me. And the wrist camera we don't understand. We really don't know.

PAO And for you Marines, aft starboard means rear right. And are we going to try to fix the wrist camera ...

TOMMY HOLLOWAY There's some consideration that the wrist camera may have been a function of the temperature, particular thermal profile that we were in and perhaps we'd try to operate it again later but that's being reviewed now by the television systems experts and will be decided at a later time.

JOHN PINER, Reuters As I understood it, the crew had to go to sleep with the headsets on last night. Was there any interference like they had the night before. Apparently there was none. They had a restful sleep, but did you talk to them about it.

TOMMY HOLLOWAY Well, I can only tell you what I know about that. The crew reported that they slept, I heard, much better last night. And I've not seen a transcript yet. My friends heard better, so I don't know if it's much better or better, but they did apparently have a better sleep period last night. And, we know by looking at the playback data that the crew was up one time and turned the UHF off for a period of 5 minutes which would be indicative that they were having interference problem and turned the UHF off to see if that would cure the problem and then turn it back on.

WAYNE DOTRAPHINO Jack Lousma, it may be the toilet situation but still doesn't sound like he's feeling too hot. Anything more in the medical situation. Are they still taking medication and how long does an illness or motion sickness have to continue before it becomes more of an issue.

TOMMY HOLLOWAY Well I think it's too early to tell anything about Jack this morning. You know when I get out of bed in the morning I can't find the floor with both feet and Jack may just be a slow starter. But, as far as medication is concerned, right now that's a thing that's between him and the surgeons and I'd rather not speak to that.

DOUG ROSS More specifically about the toilet problem. Just what is the problem what are they trying to do to fix it and if you can't fix it how do they manage.

TOMMY HOLLOWAY Well, the commode has a what is called a slinger in it that separates the fluid from the other stuff. And the pump the electrical motor that powers that slinger or separator is pulling excess current for some reason and you would guess because perhaps it was overloaded and I wouldn't draw any conclusions from that either if I were you. And the circuit breaker is opening up and the motor doesn't run anymore. Now, what we have done is it has a different mode that and we run it in a slower speed that's really not adequate for feces and we run it at that speed to attempt to clean out the system and unclog it or unstop it whatever the problem is. And hopefully that will

unclog the system, but if it doesn't we have a backup mode of using a bag within this system which draws air through it and then he basically has to deficate in a bag that's placed in the commode itself and then he disposes of the bag in the waste system in a stowage system. But there, rest assured we have a way of taking care of those situations.

GEORGE ALEXANDER You gave them extra hour worth of sleep last night. Did they take advantage of it to your knowledge?

TOMMY HOLLOWAY They certainly took advantage of it in terms of structured work and the kinds of things that fatigue an individual and as best we can tell on the ground, they were not active all night long with the exception of the UHF switching that I talked, spoke of earlier and about an hour or hour and a half before scheduled wake up, someone switched on a CRT. Probably Jack. Upstairs, but he didn't do any..he very quickly put it back in the mode and stopped using it so I have no idea why he did that, he was probably curious about something turned his CRT...and hopefully went right back to sleep.

GEORGE ALEXANDER And where did they sleep. In their couches or did one of them try the bag in the middeck area.

TOMMY HOLLOWAY I assume Gordo was down stairs and Jack was upstairs.

DAVE DOOLING With juggling the timelines have you lost any time on science instruments or are they moving ahead as was given in the schedule we had.

TOMMY HOLLOWAY Well I think overall, that remains to be seen. But, our overall plan in general is going to accomplish the majority of the activities that we are able to do considering the failures that we have. Now there's some things that we don't want to do because of the situation we're in like grapple the IECM. But with those kinds of exceptions I think we'll accomplish all that the majority of what objectives that we had for the flight.

TONY MELISKY FROM CBC With respect to the RMS, the data acquisition cameras being on the blink, the wrist camera's on the blink and you're going to even if you do lift the PDP, it's going to be a much lighter load than was planned for the loaded arm test. My question is what is the impact of the failure to acquire a lot of data on the RMS, in other words, are you going to find out what you need to know about the behavior of the RMS in flight?

TOMMY HOLLOWAY Well, I'm not an expert on the dynamics of the RMS in terms of the data that's required to reduce, the data reduction possibilities for determining the answer to your question, but my impression is that the televisions that are remaining even if the DACs do not work are adequate to provide

the basic engineering data that's we're after in those particular tests. Also we're hopeful that the DAC cameras will work tomorrow. We're going to ensure that the heaters are on all night tonight by asking the crew to turn them on before they go to sleep and hopefully after having warmed up all night, good and warm system, that they'll operate tomorrow.

REED COLLINS CBS Where was the spacecraft at the time the UHF was turned off. Was it in the same region where it's had the trouble and you also made plans last night to (yes sir), in the same area. you made plans to try to record onboard the interference sound. How did that work out?

TOMMY HOLLOWAY Well, that's that's the reason the UHF was turned off for one period. We did record some of the interference.

REED COLLINS What's it sound like.

TOMMY HOLLOWAY All the information that I have is that it's apparently a UHF interference and not and S band. That's all I know about it.

COLLINS Well what does that mean if it's a UHF rather than an S band.

TOMMY HOLLOWAY It appears to be the same frequencies that are used in common aircraft like a T-38.

MARK KRAMER CBS I recall that during Apollo they were always very explicit descriptions of the astronauts conditions. In the morning when the guys woke up they'd say Commander slept 6.5 hours the pilot slept 1.2 hours. You don't do that anymore. And consequently when we ask questions about how long they slept, no one really has a firm handle on that. What is the rationale behind that more relaxed approach to things of that sort.

TOMMY HOLLOWAY On Skylab you know we were flying 28 days, 65 and 85 I believe and it was a long flight they were concerned over continually monitoring the health of the flight crew and the possibilities of the long term situations developing and it was very important to make sure that they were getting their sleep and also that data was part of the medical experiments that were going on or at least supported the reduction of the medical experiments that were going on so I think on the short missions we're primarily concerned with how the crew feels the next morning, whether they are able to execute or not.

MARK KRAMER Actually I was talking about Apollo which were missions of about this duration or a few days longer. In those days you did ask the specific question you got the specific response.

TOMMY HOLLOWAY Well, frankly I don't remember asking the Apollo

crews those kind of question. I think you're probably remembering the Skylab.

LYNN SHERR ABC In addition to day four being substituted for day three, will the suit donning and doffing happen today with Lousma.

TOMMY HOLLOWAY Well, the flight crew has the option to accomplish that today if they would like to. The suit donning and doffing exercise is primarily an exercise to give the crew a little more confidence and they have a great deal of confidence that they'll be able to put the suit on and the time is scheduled on entry day. And, the two crews that have already flown reassures us that that's not a required activity to demonstrate that the time, but they can go ahead and say well let's go ahead and give them the option to try it so, today the pilot I believe is scheduled on flight day four and when he gets to it if he feels like he'd rather not do it, we wouldn't be upset if he cancelled it.

LYNN SHERR Last night Neil Hutchinson said that one of the reasons that Lousma didn't do it yesterday was because of the way he felt. Will it be up to him will it be up to Fullerton to decide whether they do it or is it up to you.

TOMMY HOLLOWAY In that case it's up to Gordo.

MORTON DEAN CBS Could you be any more specific about that frequency noise. Have you people figured out precisely what it might be. Say it's a common frequency sound from aircraft...

TOMMY HOLLOWAY No sir, I've told you all I know about that subject.

MORTON DEAN And concerning the trouble with the APU. Is there anything new on that and will that effect the descent at all next Monday.

TOMMY HOLLOWAY At this time there's not any new information. A possible checkout procedure on flight day seven is being reviewed and by the experts and at the present time we're anticipating we'll be able to use the APUs as normally scheduled.

JOHN WILFORD NEW YORK TIMES Two questions. Are there any plans to do more work with the cargo bay doors because of the trouble yesterday. Do you plan to exercise that in different thermal conditions again and the other question is, in the RMS work today, will you again do photography of the tile situation.

TOMMY HOLLOWAY Relative to the first question, there is not any additional payload bay door operations scheduled over what was already planned. But, currently there is a door closure activity and thedolite and that's like a surveyors instrument very precise instrument to measure angles and those measurements were made

yesterday. Those are scheduled again on flight day 6 at the end of the nose sun attitude and at the current time we are planning on closing the doors and taking those measurements and see what kind of situation we have at that time. We also close the doors before entry and that's scheduled. Second question was...

WILFORD RMS any more photography any more inspection of the tile situation.

TOMMY HOLLOWAY There is not any planned at this time.

CARLOS BYARS Houston Chronicle Getting back to this problem with the GN2 leak, is that a cabin leak itself or is this from the GN2 tank. In otherwords are they losing air along with the nitrogen. I have a second more frivilous question.

TOMMY HOLLOWAY Okay we'll get the first one. There are two systems that supplies GN2 along with oxygen to the cabin and its proportioned out in the cabin as a function of partial pressure of oxygen in the cabin and if the partial pressure of oxygen is high enough, the system flows oxygen, nitrogen and if it the PPO2 that's what we need to breathe is low it flows oxygen. And the tanks are out in the bay in the mid body of the vehicle and there are four in two tanks two on each side and two for each system. And they are ganged together, manifolded together and come through the bulkhead the aft bulkhead of the cabin and then are regulated down to lower pressures inside the cabin. Now, the leak is not inside the cabin or we would be seeing effects on the cabin pressure and on the partial pressure of oxygen and in the cabin. So if there is a leak, it's outside the cabin in either the bottles or the lines themselves. And I stress if there is a leak.

CARLOS BYARS The more frivilous one is have you heard anything yet from the fly. This is the Florida, alleged Florida Fruit Fly that was creeping across the window enjoying itself.

TOMMY HOLLOWAY No all I read in someone's handover that Jack saw one and that's all I know about it.

SAM ALLIS Time Magazine What is how far have you gotten in your space plasma physics experiments. How far along are you.

TOMMY HOLLOWAY Rephrase your question.

SAM ALLIS How far how much have you accomplished in your two man space plasma physics experiments .....

TOMMY HOLLOWAY Well I can't answer that question quite honestly. My job is to give the POCC the opportunity to execute as much of that activity as possible and their about doing that. Now we did read up a note from that was generated by the POCC this morning you may have heard it on air to ground and they sounded very enthusiastic about the quality and the amount of

data that they are receiving and so based on that interpretation, on those words I would think that they are very excited about the situation and the quality and quantity of the data that they are getting.

PAO We did power up the PDP yesterday as scheduled.

KENNEDY

DICK LEWIS Chicago Sun Times ... I believe by Col. Lousma that the (excuse me could you back up we missed part of that) Edwards was drying out is there any more on that and is there any possibility that if it does dry out the landing might be changed.

TOMMY HOLLOWAY I haven't been briefed on the status of the lakebed in the last couple of days. That may have been because my schedule has not accommodated the last briefing I had we did not anticipate the lake bed being dry enough to support a landing in the time frame that STS-3 would be flying.

PAO That question was from Dick Lewis Chicago Sun Times.

ROB ZEA Channel 2 Could you elaborate on the particles that were seen coming off the back of the spacecraft and whether they could pose any serious problems.

TOMMY HOLLOWAY Well, let me say two things about the particles, first of all both the STS-1 and STS-2 crew believe that they have seen similar particles although they report that it didn't stick in their mind quite as well as the flight 3 guys have seen. Perhaps that's caused by the orientation of space craft. We do have different orientations and are flying we flew a local verticle attitude constantly almost on flight 1 and 2 so we have a different orientation and different sun angles and it may just be a phenomenon of coming out the back end out of the main engines that we also experienced on flight 2. Additionaly there is a change in the main engine hardware that allows a constant vent that's used during entry for purpose of purging the main engines. It was not present on flight 1 and 2 and as of last evening, there is a theory and or suggestion by our main engine experts that what we're really seeing is some residual lox venting out these new drains. These drains were placed in the vehicle to provide a vent capability during entry that doesn't use as much helium as the system used on flight 1 and 2.

ZEA Apparently no serious problem.

TOMMY HOLLOWAY We don't think so.

MARK BLUME Medical World News You said at the beginning that the crew wasn't feeling quite as well as you would have liked. Are you including Gordon Fullerton as well. Do you have any indication that he is not quite up to snuff just as Lousma is

not.

TOMMY HOLLOWAY Yes, generally that is correct. He's not feeling as well as we'd like, but Gordon performed very well yesterday.

BLUME The question was asked of you before whether the crew was still taking medication and you referred that to the physicians who fortunately is not sitting next to you. Could you answer the question with yes or no. As the crew as the Flight Director you must know. It's an operational point. Is the crew taking medication.

PAO Well as a matter of fact that is private information between the man and his doctor and I don't think we have the privilege of releasing that unless his doctor says we can do that.

BLUME I don't believe that's true unless the rules NASA rules have been changed.

PAO Well I'm afraid we're just going to have to defer to the doctor on that one and let him decide and we'll try to make him available to you.

MARK BLUME One final question. On the sleep problem. Surely ou must have some working theory as to the radio interference. Chinese radar or God knows what. What are you people kicking around the MOCR.

TOMMY HOLLOWAY Well, frankly let me say up front that there's people that are looking at that and they're trying to sort out what it is. But, with the data that we have, it's very difficult and it really doesn't make any difference what it is right now. The problem that we have is bothering the crew and we're doing our best to get a situation that will prevent that from happening and somebody else is off working that and when they tell me what it is and what I can do about it I'll go do that.

2nd part of press conference

REG TURNELL BBC I didn't fully understand the references to reentry and landing. Is it a fact that you are considering simplifying the reentry and final landing because of all the technical troubles and perhaps cutting out some of the maneuvers because of the loss of tiles.

TOMMY HOLLOWAY Not at this time. Right at this at the present time the entry is planned as scheduled. If we should require an entry tomorrow for example, and I was executing it I would do it exactly as was planned preflight.

HOWARD BENEDICT AP You've had a lot of problems on this flight. Could you give us, dispute them, could you give us your overall assessment of how the Columbia is performing and what are it's chances to complete the full to seven day mission.

TOMMY HOLLOWAY Well, you know I don't have any insight on how long we're going to fly, that's kind of guessing, but I'm confident that we'll be able to complete the mission based on the status of the spacecraft right now. None of us can see in the future on what might happen, but based on the current situation and the current set of problems that we have, I'm very confident that we'll be able to fly full duration. In terms to the number of problems that we have in the spacecraft, I guess we all would like to have a spacecraft that was absolutely perfect. But in terms of my own expectations, I think when I get honest with myself considering that this is the third time that the orbiter has flown, I think we're doing okay at this point in the flight.

PAO Okay we're advised that the current assessment for the lake bed at Edwards is it would take 4 to 6 weeks for it to dry to acceptable levels.

TOMMY HOLLOWAY That's the data that I had also, I thought the gentleman might have some new stuff.

PAO Okay for the benefit of Kennedy let me repeat that that the current assessment for the lake bed at Edwards it is would take four to six weeks for it to dry.

GEORGE ALEXANDER Tom, not to belabor the point, I just want to make sure that I understand. The UHF noise is just unmodulated carrier wave that the guys are picking up on their receivers.

TOMMY HOLLOWAY Well I think you've said more than I intended for you to say because we don't have enough capability to tell that much about it and really need the experts over here to expound on that.

GEORGE ALEXANDER It's not some kind of a feedback loop which ou sometimes get in a public system you know that...

TOMMY HOLLOWAY No I don't think so.

GEORGE ALEXANDER They are receiving radio energy from some source other than what you anticipate receiving that particular part of the ....

TOMMY HOLLOWAY They are receiving something from the ground apparently. If that's your question. It's not coming from the orbiter.

PRESS not radar.

PAO Did you say it was not radar, Tommy.

HOLLOWAY No I said it was not coming from the Orbiter.

PAO You did not say it was not radar.

HOLLOWAY I don't know what it is except it's in the UHF...

MORTON DEAN Tom did you say that it is not effecting the spacecraft in any other way, it's not being picked up on ...

TOMMY HOLLOWAY Absolutely we haven't no indication of any problems that's caused by the radio interference onboard the orbiter except the noise keeping the crew awake.

PEERS AKERMAN London Times Could you clear that up. Is it radar or not radar and you say that it is not a single band right.

TOMMY HOLLOWAY You know I'd really like to go back to what I said in the beginning. All we know about it is it is apparently a UHF frequency that's the same kind of devices that are used on airplanes, airplanes talk to one another and talk to the ground and that's all I know about it.

PRESS Then what you experienced last night is different in it's characteristic from that you noticed the first night isn't it.

TOMMY HOLLOWAY Not necessarily, I think we found out more about it last night.

PRESS It's not it doesn't interfer with the S band.

TOMMY HOLLOWAY I , at this point we don't think it's the S band so that's an update from last night. That's what I said in the beginning. It appeared to be UHF.

MARK KRAMER One question for John Lawrences and one for Mr. Holloway. Will Public Affairs let us hear that, we play that on the loop, I think Tom said he heard you said you heard some it the ground heard some of it.

TOMMY HOLLOWAY We didn't record it on the ground, it's been

recorded onboard.

MARK KRAMER Oh, we was in the general sense. Okay the other question well are they going to dump that to the ground will we hear that today.

TOMMY HOLLOWAY I'd have to check back with the guys I don't know.

MARK KRAMER Let me ask you a landing question if I may. I think that the chart shows there is only after the nominal landing time at Northrup there is one more pass during which you can land at Northrup and if you have an unacceptable situation there due to weather or winds your out of opportunities at the Kennedy Space Center. Does that automatically mean that if you can't make it there you go another 24 hours and try Northrup the following day.

TOMMY HOLLOWAY That would be the general plan, yes. We always have the capability to fly through at least the early part of the program. We maintain a capability to fly additional day after the planned deorbit.

MARK KRAMER Is there any consideration being given to chopping one rev off the mission to come into Northrup earlier in the day when the winds are I believe generally lower.

TOMMY HOLLOWAY Well, as you probably have guessed there is a capability of doing that and it's not a major change to do that. Is simply get the crew up an hour and a half early put them to bed an hour and a half early the previous day and if required we can certainly do that. But at the current time we are not necessarily anticipating doing that. We'll wait and see what the situation is when we get there.

PRESS One more question about the radio interference. You said that is it S band. Does that mean that is not ....

TOMMY HOLLOWAY I did not say it was S band I said it was UHF.

PRESS Okay does that mean it is not ground radar.

TOMMY HOLLOWAY I'm not a communications expert and you ought to find you one and talk to him.

JAMES WILKINSON BBC I just want to clear my mind about the nitrogen leak. If it is a leak how much is leaking away and is it possible that it might cause a shortening of the mission.

TOMMY HOLLOWAY During the period of time where the instrumentation indicated that leak, that instrumentation indicated we were leaking a pound, a pound and a half an hour. Now in terms of the duration of the flight and I emphasize that that so-called leak that we really don't know whether it's

leaking or not, has stopped at this time and has been stopped for some 5 or 6 hours. Even if the leak continued at the rate the instrumentation is indicating we have the capability to fly the full duration of STS-3 if we elect to do so and have nitrogen left at the end of the flight.

TONY MELISKY CBC At the risk of being gruesome, I'd just like to clarify this toilet problem. Is the toilet blocked, can it be fixed, or is there possibility of the crew may have to endure this for the rest of the mission.

TOMMY HOLLOWAY Well I don't know whether it can be fixed. That was being worked on when I left the control center. They may have occurred by now, we may know. But, let's presume that it could not be fixed there is a backup way of using the commode by instead of letting the material fall down into the commode being sucked down by air a fan and then separated by the slinger. The slinger function is what's wrong what's broken. The fan still works and there's a bag there's an alternate way of using the bag in the commode where it can gohead and function with the commode in a backup but less desirable fashion and continue to operate and that will be the next step if indeed the slinger is malfunctioned.

JOHN BISNEY RKO Is this radio interference only being noticed night time or do you pick it up during the day. Does it interfere with any transmission.

TOMMY HOLLOWAY Well we have not had any reports that I am aware of occuring when the crew is active and working but that may be simply because they're busy all the time using the radio all the time and they may not be noticing it. I really that's about all I can say about that.

MELISKY To get back to the toilet problem again, is the have the crew complained that the air is foul or is it sweet smelling up there.

TOMMY HOLLOWAY I have not had any reports of any problems with odor on board the orbiter.

PETER LARSON Orlando Sentinal Star Two quick questions. Again, on what basis are you so confident there are no tiles missing from the bottom of the ship when you can't inspect obviously with the wrist camera and secondly what were the circumstances surrounding the discovery of the broken toilet. Who made the discovery and roughly at what time.

TOMMY HOLLOWAY Well let me answer the first question by saying Mr. Moser was over here yesterday and gave a very detailed set of information about that he's the expert and I'd defer to him.

PAO That briefing has been transcribed and is available in the newsroom.

TOMMY HOLLOWAY I don't mean to put you gentlemen off, but my job is to fly the orbiter and make sure we get the most done with what the experts tell me that I have and I leave that up to them. In answer to the second question is that as I interpreted what was going on Jack was down using the commode and it stopped, the separator stopped working and that was about the time that we first talked to them whenever that was.

PEERS ACKERMAN Times Approximately how many pounds of nitrogen did you lose in that period when it was leaking 1 1-1/2 pounds.

TOMMY HOLLOWAY About 20 pounds, but if you'd like based on instrumentation we may not have lost any, but based on instrumentation, if you chose to believe it, about 20 pounds. Which is not a significant amount in terms of 250 or so pounds that we had in the beginning.

LESLIE LINTER CAP NEWS Per this updated CAP that we now have this morning on what's now flight day 4 and 5, about 45 minutes before Col. Lousma goes to sleep he's due to do exercise. Now, at least as I've always been brought up you're told never to do exercise within two hours of the time you go to bed cause it will get you too riled up you won't be able to relax. I was wondering, is this an experiment. Is this per his own request or what. I just looked on the other CAPs in the past three flights or two flights and it's never been done before.

TOMMY HOLLOWAY Well, you probably didn't find any exercise in the first two flights. We have a general ground rule or guideline, is probably a better way of saying it that on very short duration flights exercises are not required, flights of up to 7 days at crew option we'd like for them to exercise 30 minutes a day and for longer flights there's additional requirements and I forget what those are offhand. Now, why our crew activity planning people are scheduling exercise just before sleep is a good question, probably because it was an oversight on their part and we ought to go fix that on flight 4 and not do it again.

PAO Any further questions. Please get your questions out of your system I really want to let this poor man go home and I don't want a whole bunch of people running up and trying to get one last thing. He's had a long day and he's got a long night. Okay thank you very much. Appreciate your help and attention.

END OF TAPE

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STS-3 CHANGE OF SHIFT BRIEFING DATE 3/25/82 DAY 84 PAGE 1

Good morning ladies and gentlemen. Welcome to the Change of Shift Briefing. Let me introduce Dr. Ellen Schulman who is the Flight Surgeon for the Ivory Team and of course you recognize Ivory Team Flight Director Tommy Holloway. Let us begin with a summary of the overnight shift by Mr. Holloway. Tommy.

TOMMY HOLLOWAY Well the last 12 hours has been relatively uneventful and that's kind of the way I like them. We didn't have a great deal to do. The spacecraft behaved perfectly for the last 12 hours and we had zero additional failures with one minor exception. A small instrumentation bias that showed up that has no significance. The flight crew appeared to go to bed about on time last night. They were up and into what we would consider one of the more productive and busy days today, and they were up on time. They reported as you probably heard that they were eating much better and sounded to me like they were in very good spirits and were eager to get into today's activities and were feeling better than what they have on previous days. And with that I guess, since it was sort of an uneventful evening, we'll get on with the questions.

Well, let me see if Dr. Schulman, do you want to make any remarks about the crew's health or anything.

DR. SCHULMAN I've nothing to add.

Okay. Questions here in Houston.

PETER LARSON Yes, Dr. Schulman did Jack and Gordon have a good night's sleep? Did they get more sleep than they did on Monday and Tuesday nights and how are you improving their ability to get a better rest during the evening.

DR. SCHULMAN We don't know exactly how much sleep they got, but from what they told us this morning, it sounds like they had a restful night. We left some of the equipment powered up last night so the cabin would be a little bit warmer and we were careful to not wake them up with any alarms during the night.

What about their medical intake. Do you have an idea of that?

DR. SCHULMAN What do you mean.

Medication. Did they take any last night, today, yesterday.

DR. SCHULMAN Yesterday morning they each took a motion sickness medication and to my knowledge they haven't taken anything since then. They are feeling better.

Just to follow up. Was there any more discussion of sleeping pills?

DR. SCHULMAN No.

PEERS ACKERMAN Times of London Was there any interference from that UHF source reported last night?

TOMMY HOLLOWAY Well, first, let me answer that question this way. The crew slept without the headset on last night and although they haven't reported it yet, we're hopeful that they did not have any interference this time. Now we did take an opportunity to record the intercom of the orbiter at a particular time. Intercom A and we have recorded the interference and we have that noise recorded.

PEERS ACKERMAN Is this recording you made, is this from last night and if so, what do you what have you analyzed?

TOMMY HOLLOWAY Well, we haven't analyzed anything and as far as the quality of the data all it is is noise and it's not any qualitative data that you can derive any analytical results from in terms of the source of the noise nor what's causing it and so on and so forth. So, we can't really analyze it. All we can do is determine that the noise was there and it's a very irritating buzzing sound of 1 to 2 seconds that occurs every 10 to 15 seconds. And that's frankly all I can say about it because that's all I know about it.

That's correct. It was last night.

JOHN WILFORD New York Times Do they get any of this radio noise during the day time? Or would you not notice it because of your own communications.

TOMMY HOLLOWAY Well, I think that's probably correct. We have not had any reports of it in the daytime, but I wouldn't draw any conclusions from that. It might be occurring during the daytime and because of the fact that we're communicating with them so often and so contin...at times continuously, they may not be noticing it.

LYNN SHERR ABC I'm sorry I'm confused about the difference between the buzzing 1 to 2 seconds every 15 seconds and the interference from the night before. I thought there was no interference last night.

TOMMY HOLLOWAY Well, as far as I know the crew did not hear the terference because they were on a different system and we recorded intercom system and they weren't wearing a headset last night and we have speaker boxes in the spacecraft that is attached to our communications uplink and downlink and the

intercom per se was not hooked up to that system and the noise was recorded on intercom now. I got there, we're not sure of and of course we don't know where the source of the noise is.

Is that something that happened every 90 minutes the way it happened the night before on the spacecraft.

TOMMY HOLLOWAY It appears that that's the case. It's the same noise that we've been talking about all three or four days. How many ever days it's been.

So you heard last night what they have been hearing but they didn't hear it.

TOMMY HOLLOWAY Yes, we recorded it on an onboard tape recorder and then dumped that tape recorder, played it back and listened to it.

Okay and just to clarify, you said it's a buzzing of 1 to 2 seconds duration every 15 seconds.

TOMMY HOLLOWAY 10 to 15 seconds.

Once every 90 minutes.

TOMMY HOLLOWAY No, for a period of 15 or 20 minutes.

10 to 20 minutes. Okay thank you.

TOMMY HOLLOWAY 10 to 20 minutes, what was I don't (the duration) oh okay of the...

MARK KRAMER What time did you dump that audio to the earth so we can look for it on a piece of tape. And was that on the mission audio or was it some other channel.

TOMMY HOLLOWAY Is was on intercom A and Mark I don't recall. It was I listened to it about 4:00 this morning.

Do you know if public affairs line put that out.

Yeah, we can get that. We don't have it yet but we can get it to you.

Was not feed out on the...

No it wasn't fed out on air to ground or any of the public access loops.

Could you make that available to us please.

Yeah. Yep yep.

WAYNE DOLCEFINO Can you run through the experiment today with the PDP just sort of from beginning to end what we're going to be doing throughout the day with it.

TOMMY HOLLOWAY Well, we're doing a number of things with the PDP and the first thing we're going to do in lieu of performing a unberthing and berthing test with ICM, we're going to undock or unberth or the PDP and then immediately do a berthing test to see how well we can reberth a payload. That's the first activity. After that point we're going to do a control systems evalution with the payload on the RMS and see how the RMS operates with a payload. Of course, up to this point we've operated the arm without anything on the end of it and it was built to handle payloads. At that point we're going to do what we call a primary RCS interaction test that's involved in similar to the unloaded interaction test involves firing the primary RCS reaction control thrusters onboard the Shuttle to better understand the dynamics of the RMS. After that point we'll spend the rest of the day performing detailed science objectives of studying, looking for the field the magnetic field of the earth and assisting in the VCAP experiment for the scientists. And if you want to know the details of the science of those operations, you'd best talk to the DIs.

PEERS ACKERMAN Somebody I guess has to ask what's the status of the head onboard the Columbia at this time?

TOMMY HOLLOWAY Status of the commode? Well at the time we're lipping along ON the commode. It's still operating based on what Jack reported just before I left the control center it appears that the commode in the low speed mode has slowed down a little bit and he's worried that it may stop. We're still thinking about some additional steps to take to clear it up and help that situation, but that's under review now by Neil Hutchinson.

ALBERT SAILSTED Baltimore Sun You referred a few moments ago to dynamics test of the arm by firing the reaction control jets, do you mean by that you're going to be holding the arm up and then moving the Shuttle or orbiter and then seeing how the arm reacts to those strains as it were?

TOMMY HOLLOWAY Yes sir absolutely.

ALBERT SAILSTED Will you have a payload on the end of it at the time?

TOMMY HOLLOWAY Yes. Loaded arm means that there is something on the arm namely in this case the PDP. Originally that was to have been done with the IECM, but since we're unable to or nwilling, that's probably a better way to say it, to unberth the IECM we're using the PDP for that function.

ALBERT SAILSTED About what time today would you plan to do that.

TOMMY HOLLOWAY I don't have that information with me but I'm sure you can get it.

Yeah, we brought back a summary timeline that's being xeroxed and will be available out here it'll have that on it for you.

What was the times you said.

TERRY WHITE About 11:30 local when it shows on the summary timeline here.

JOHN WILFORD Dr. Schulman what are your instructions to the crew as far as taking medication today and do you consider the nausea a thing of the past?

DR. SCHULMAN You mean medication for motion sickness?

JOHN WILFORD Yes.

DR. SCHULMAN For the last couple of days the instructions have been for the crew only to take it as they need it. We haven't suggested that they take it on a regular basis. And, I think we've turned the corner with the motion sickness. I think they're both feeling up to par today.

JOHN WILFORD We were turning the corner yesterday. Have we really turned the corner today. That was the phrase yesterday. I want to know how far around the corner we are now.

DR. SCHULMAN I can't tell you that I think we're better today than we were yesterday, and both crewmen sounded very good this morning.

KENNEDY

REG TURNELL BBC A couple of questions. Can you tell me please what happens to the RMS when it's not in use. Is it stowed away or clipped down or what?

TOMMY HOLLOWAY Yes sir it's what we call cradled. It's initially the RMS is stowed inboard in the orbiter and we rotate it approximately 60 degrees to get it in a position where it's we're able to use it and then we do what we call uncradle. That's undock the arm and move it into a position where you can use it. So, during the nonactive periods, that is the periods that the RMS is not in use, it's put to bed so to speak and that is put away and we do that primarily because that's the best situation to be in should we encounter a contingency situation

where we would require a quick type deorbit and we wouldn't want to be interested in having to worry about an RMS or payload.

REG TURNELL Thank you and the other point may have been dealt with the previous change of shift, but I'm sorry I missed it. What has happened about the pressurization leak?

TOMMY HOLLOWAY Well at the present time the leak has disappeared. It disappeared sometime, the so called leak I should emphasize, it disappeared sometime yesterday and has been infact we have used zero almost no nitrogen in the last oh, 20 hours or so. So the leak disappeared sometime yesterday and has not reoccured. And we're almost caught up on our nitrogen I might add. We're almost back on where we expected to be at this point.

REG TURNELL Isn't that rather worrying though that you should have a completely unexplained leak.

TOMMY HOLLOWAY Well, to be honest with you I'm not particularly worried about the leak as long as it doesn't start again and even if it did start again, we'd have more than adequate margins at this time and we'll be able to deal with what ever comes up at the time. I might add that if all of the N2 should suddenly leak out instantaneously, it would not be a serious situation. We could still effect a normal entry into Edwards landing, not at Edwards now at Northrup, landing site and all would be well. (You called it a leak, we don't really know that it's a leak do we) Not really.

ROGER CLARK You decided against an overnight heating of the arm as a possible fix for the wrist camera if not the wrist taking out the elbow camera. Could you explain how that procedure could have jeopardized the elbow camera?

TOMMY HOLLOWAY I'm sorry I missed the details of that question. Try me again.

ROGER CLARK You decided against an overnight heating of the arm as a possible fix for the wrist camera. And that was decided to not to risk taking out the elbow camera. Could you explain how that procedure could have jeopardized the elbow camera?

TOMMY HOLLOWAY Well the I still missed the first part of your question, but let me answer it and see if I get the intent of your question answered. The elbow and wrist camera have common power sources and their potential failure modes in the camera power sources that would result in a, if there is a short on the n the wrist camera system, would result in that short showing up into the elbow camera and causing it to fail should we repower the wrist camera. So, rather than take a chance of losing both cameras, we have elected not to repower the wrist camera.

JOHNSON

JAMES WILKINSON BBC Apart from the medical consultations that the astronauts have been having are there any other conversations they've had with the ground which we haven't heard.

TOMMY HOLLOWAY No sir.

PEERS ACKERMAN One further question, this morning that Jack Lousma said that a knob on the waste system came off in his hand from one of the valves. What did that relate to.

TOMMY HOLLOWAY That's one of the knobs that is used to manipulate the valves in the commode system and he is been replacing that putting that knob back in place when he needs to use the system. But it's, you could consider it a malfunction, of course, he's worked around the problem and still using the lever.

Sounds like the knob came off of your commode lid.

PETER LARSON Orlando Centenal Star Had the astronauts resorted to using any of those backup bags that fit inside the commode.

TOMMY HOLLOWAY They have not used the backup bags as far as the kind that are used inside the commode, when you do that it's apparently drastic step in terms of the utility of the commode on this particular flight. And I'm sure they wouldn't do that unless they'd talked to us, and they have not done that.

But in terms of the storage of the solid waste, are they using some bag system as opposed to the compartments where the...

TOMMY HOLLOWAY I don't think so, I think they're still using the commode.

PEERS ACKERMAN Since they've been flying with nose to the sun the thing has been cooling down. Have they done any more tests on the payload bay doors or any more scheduled today?

TOMMY HOLLOWAY No sir. There's a door schedule door operation schedule day after tomorrow. Very similar to the one that we had on flight day 2. That will be in midday on day after tomorrow and the test is identical in terms of the sequence that we go through at that time.

PEERS ACKERMAN So, just to go that again, you said earlier on a couple of days ago because of the problem you've had originally with the payload bay door when you couldn't close the latches that you would be paying more attention to testing it while it was in this ATR nose to sun attitude. Have you decided not to do

that as to wait until the scheduled test?

TOMMY HOLLOWAY Right now that's our plan. We're going to wait till the regular scheduled door cycling test day after tomorrow.

GEORGE ALEXANDER Just to clarify something Neil told us last night and make sure that it's still current, once you have the arm on the PDP you're going to leave it there for the next couple of days.

TOMMY HOLLOWAY Neil is still considering all of the tradeoffs in terms of what we were going to do with the arm and the PDP this evening. At the present time the plans are to particulary if the grappling goes well this morning, our plans are to reberth the PDP ungrapple and put the arm away which is our standard operation for the reasons that I explained earlier. Now there are some advantages of leaving the arm out. The PIs would like to get additional data, but, our standard operating procedures to put it away during the evening and that's our current plan although Neil has been provided all of the information in terms of what it would take to spend the night PDP out and he'll make that decision as the day goes on based on the circumstances at the time.

MARK KRAMER CBS On that same subject. When you do that do you actually cradle the arm in those arm holders and then rotate it inboard so that it's completely prepared for door closing.

TOMMY HOLLOWAY Yes sir.

MARK KRAMER There's no position whereby you just cradle it and leave it.

TOMMY HOLLOWAY No sir. We rotated in. It's ready to go.

MARK KRAMER Okay.

Ready to come home.

Pete right here behind you.

JAMES WILKINSON BBC Are there any plans for President Reagan to talk to the astronauts this time?

TOMMY HOLLOWAY Any plans to do what sir?

JAMES WILKINSON For the President to talk to the astronauts this time.

TOMMY HOLLOWAY Not that I know of.

PAO Anything further?

TOMMY HOLLOWAY If he decides to I suspect we'll do it.

PAO We've got some people going over to the MOCR now to get copy of that tape and we'll duplicate it and make it available just as hastily as we can. I can't tell you how long that's going to be but I think we can probably expedite that and we'll also make arrangements to get it to the folks at Kennedy. One final note, Malcolm Hines from Spar Aerospace Limited will be here at 10:00 to give you an RMS briefing. Thank you.

END OF TAPE

Good evening and welcome to the change of shift briefing. I think it's evening. It's always dark when we come in and dark when we go home. This is Neil Hutchinson, the outgoing flight director of the Silver Team on my immediate right and he will give you a run down on some things and then representing the OSS-1 payload, we have Dr. Werner Newpert, program scientist from Goddard Space Flight Center, and then Dr. Sam Pool representing the medical side of the house if you have any questions in that area. We will go ahead and start with Neil and then after we...I'm not sure what you had planned for the OSS-1, perhaps Dr. Newpert will have some things to say and we can go to questions at JSC and move to the other centers and then come back. Neil.

HUTCHINSON Well good evening. We had a really busy day today and a very, very successful one. As you all have probably heard, we're having a little fuss at the moment because we've had a problem with the communications system and we'll talk about that a little bit. As far as the day went, we accomplished one of our really big DTO's on the flight by picking a payload up and you've probably seen all the television as it...and listened as it occurred today. We got all of the RMS loaded arm work done this morning right as scheduled. We got all of the science done this afternoon with the exception of about, I think we missed about 1 REV or maybe an hour's worth of VCAP vane search activity this afternoon. We ran several other smaller orbiter DTO's. We are still in tail sun attitude. Vehicle is continuing to cool down at about the rate we expected, a little bit slower than we expected and it's not as cold as we had thought it would be by this time. This attitude cools the vehicle off a lot slower than the tail sun did so that's not totally unexpected. Basically, as far as the flight plan goes, today we accomplished everything we intended to do. You will recall, last night I told you that the one thing that we didn't accomplish that we had been set out, that we had set out to do premission was picking up the IECM and you all know why we didn't do that. The only RMS DTO we have left is backup cradle which we probably will get done before we quit with the arm. That's just a fairly simple procedure, about 20 minutes long, where the crew puts the arm away in the backup mode. Tomorrow's going to be another busy day. We have done some things to start saving a little bit of cryogens to open up our entry options. I guess about the only thing I want to say about that is we're looking at weather and no decisions are going to be made for a couple of days. We had a private med today.

DR. SAM POOL Shortly after lunch. We received a message from the crew that they wanted to talk to the surgeon. The pilot, Gordon Fullerton, said he had some lower abdominal discomfort, cramping, and he was interested to know whether or not there was anything in the medical kit that we could prescribe which might make him feel some better. We talked about that problem and attempted to rule out anything serious. Our conclusion was that

he had some gas in his abdomon and this was probably giving rise to some cramping. We prescribed Mylanta which has a combination of an antacid and simethicone, which is a surface tension reducing agent and we also thought it was time that they should start to eat. We think that one of the problems perhaps in producing this abdominal cramping has been due to the fact that they've been taking in quite a quantity of fluid, but perhaps not eating as much as they should and so we recommended that they begin to eat, and as a matter of fact, just before we came over, we heard on the air to ground loop that they were beginning to do that.

HUTCHINSON Okay. I don't have anything else. I'm sure there're going to be a lot of questions about what we're doing with the end of mission and we'll try and answer them. Would you like to say some things about the things we accomplished with the science today?

DR. NEUPERT Be happy to.

HUTCHINSON Then we'll back up to the operations part.

DR. NEUPERT The OSS-1 payload operated very well today. All instruments that are active continue to be in good shape. Not all of them are taking data. Two of them are waiting until we get to bay to the sun and one, the solar overbottom, monitor the irradiance monitor and solar flare x-ray polarimeter experiment did not take data. The induced atmospheres experiment has already had its primary data taking run. It was on for a short period of time today. The two additional experiments, thermal canistry experiment, continues to fulfill its scientific objectives by demonstrating that payload's interior to a large volume can be held at very comfortable temperatures in spite of extreme temperatures on the outside using this heat pipe technology and the contamination monitor experiment began picking up slight amounts of molecular accretions on the surface of quartz crystal microbalances primarily in the direction viewing out from the bay. It was very small accumulations in directions viewing toward the liner. Of course, the highlights were the joint operations with the vehicle charging and potential experiment plasma diagnostics package. You saw it on television. You saw the crew scanning through the beam and picking it up which was an exciting day, exciting time I can tell you in the payload operations control center. We do have some initial assessment of what that beam appears to be at first glance. Of course, tomorrow is another active day but interestingly, we can for instance, estimate that at a distance of 30 feet from the emitter, the beam seems to appear over a width of about 20 feet, so you can imagine that it starts out at a width of that small aperture which is about half an inch and it verges to a beam of 20 feet. Not only did the PDP detect charged particles but it detected a considerable amount of plasma wave energy and this will be explored tomorrow with the sequences that are going to be carried on in the joint beam operations.

They will be exploring as to why this beam is so wide. To give ou another idea of some of the things we are exploring, if this beam of electrons were shooting out in a vacuum, of course, it wouldn't diverge at all. Even in the pressures that we are seeing, which are probably typical of orbital pressures, an electron would traverse about a 1,000 kilometers of the ionosphere before it collided with another particle and be scattered so the width that we're seeing is not due to collisions of the particles, the electrons coming out with the particles in the atmosphere. It's due to some other kind of plasma interaction. As I say, it's going to be explored to some lengths tomorrow. One of the highlights of the vehicle charging experiment, having to do with charging of the orbiter, they noticed that the orbiter charged to some higher potential at night than during the daytime. Not much potential, about 10 volts instead of 1 or 2 volts negative, and they hypothesize that there simply is less opportunity for the charge to be neutralized at night so they're investigating that further too. So, altogether, it's been a fine day.

Okay. Thank you and I think we'll go ahead and start with questions now. Have we got the microphones. Okay. Jules Bergman here.

JULES BERGMAN...This is for Dr. Pool. Did Fullerton say whether the Mylanta helped him?

DR. SAM POOL We don't know yet.

JULES BERGMAN...And you said you recommended that they eat.

DR. SAM POOL Yes.

JULES BERGMAN...Does this mean that they haven't been eating all their meals or whatever.

DR. SAM POOL That's correct. For example, this morning that we reported that the pilot ate granola with bluberries and grapefruit drink with a total caloric intake of 400 or so. We do not think they've been eating and they say they haven't been eating their entire meals.

JULES BERGMAN...Just too busy or what?

DR. SAM POOL Well no. I think the lingering effects of the motion sickness problem which we've had and perhaps the schedule had a part to play in that as well. I think they're beginning to, I think Jack particularly is beginning to eat now and I think Gordon this evening is also said he is going to eat.

JULES BERGMAN...You said the lingering effects of a motion sickness problem. Do you mean that or the dexadrine and scopetex?

DR. SAM POOL Well, the last time they took scopolamine dexadrine was I believe yesterday morning and those effects should pretty well have worn off at this point. I think they're also beginning to get over their motion sickness. As I watched them on the television today, I noticed they are moving about the cabin quite freely in doing the job that needs to be done. As far as the Mylinta and whether or not it's going to be effective or not, we've had some experience with this sort of problem in spaceflight before. Whether it's going to be effective in this particular individual or not, we hope so. There's a private medcom as a matter of fact along about right now and hope (garble)

HUTCHINSON Providing the comm works.

DR. SAM POOL Yeah. Hopefully I'll have some feedback on that soon.

Okay. And also, if I don't identify you, please identify yourself and your affiliation. Right back here in the next row back.

PETER ADAMS...CONNET NEWSPAPERS...Could you discuss a little bit about the weather problems and Northrup. Are we looking at a 24 hour delay or a one revolution (garble)

HUTCHINSON Yeah. I really shouldn't have said weather problem. I think really the best way to describe that thing is...we've been doing very well on our consumable situation as the flight has worn on here and with just a little bit of tweaking, we think we can get ourselves an option to stay another day. Now that doesn't mean we're going to do that, but it does provide us some flexibility in case we might encounter a weather problem later in the mission.

PETER ADAMS...Would you be more inclined to land earlier or later?

HUTCHINSON Well, that depends on what the weather situation turns up. And really, you know, it's going to be the middle or end of the weekend I would expect before any decision is made on what to do because we don't like to prognosticate that far, we aren't successful in prognosticating that far in advance on the weather.

PETER ADAMS...If you were to delay a day in landing, do you have enough fuel to do such and do you have enough fuel for a continuency if you had to land, let us say 48 hours in advance.

HUTCHINSON Yes sir.

PETER ADAMS...Thank you.

48 hours?

..JTCHINSON Yes sir. The cryo situation as it exists now, and I'm not exactly sure of the numbers, but we basically have been running about a couple of kilowatts, maybe 3 average power level lower than we thought we were going to run and of course as you all know our hydrogen for the fuel cells is the critical consumable and when I said management, the management techniques are very simple. We were planning on going back to two computer operations, normal operations today for the G&N computers. We didn't do that. We turned off some heaters that we know we don't need. For example, the heaters in the flash evaporator system because we haven't been boiling any water since launch basically and those kind of things with that little kind of a tweak, we're going to be able to provide ourselves enough cryogenics to go 24 hours extra, another day at normal mission power levels, and still have our 24 hour wave off capability.

CARLOS BYARS...You just answered one thing for me right then. You have enough to go an extra 24 hours now I believe Neil. Is that correct and you want to stack up enough that you can go an additional 24.

HUTCHINSON No, no let me correct that. We have enough as projected with the kind of power levels we've been seeing to extend an extra 24 and maintain our 24 hour reserve that we ; ays will maintain. We have no intention of nominally cutting i..to that 24 hour reserve. So right now on the books, projected assuming we don't get into any ditties as we go down the road here, we have enough for a 24 hour mission extension and then come home and when we get home we'll have 24 hours left.

CARLOS BYARS...Yes, that's what I got. Would you comment please on your communications problems. We've just heard some bits and snatches and are you having some sort of a problem there?

HUTCHINSON The easiest way I guess to describe the comm thing, the comm system, like all our other systems, is farily redundant, in fact completely redundant. There's really two of everything and even more than that it can be what we called cross strapped which means you can take one part out of one of those systems and make it talk to one part in another one of the systems and get a path that way to communicate. On top of that, individual parts of each one of those two strings of communications gear have redundancy in them. Today, during the normal execution day, we had an experiment associated with the plasma diagnostic package. One of things, you recall that it does, it's mapping the orbiter's electromagnetic interference. And one of the things we want to find out is when the S-band system is in high power mode, what kind of EMI is around the orbiter. And so, we have been operating in what we call low po.er mode. The only time nominally we ever operate in high power mode is in launch phase. And the reason we do that is to pierce the plume of the SRBs. So, once we get on orbit, we go to low power and stay there, and that's what we've done in STS-1 and

2. Today, we went back to high power for the expressed purpose cooperating with the science people to get this map of the orbiter S-band EMI. And when we went back to low power at the end of that exercise which we did, that was the last PDP activity we did today, was the EMI mapping. And when we went back to low power about, I don't recall, a couple of hours ago, the low power side of the S-band transponder system number 2 was inoperative. Now the problems that you probably heard when you came in and when you were waiting for me to get over here were associated with troubleshooting that problem and nothing else is broken that we know of. We're just trying to explore exactly what it is in the transponder that is not operative now. There are 2 transponders on board, you use one of them at a time. They have a high power mode and a low power mode. And inside each mode, they have a high and low frequency, and that represents multiple paths through that given transponder. The low power mode on this transponder in both the high and low frequency appears to be inoperative. And that's really all I know now. Now the thing that happened at Hawaii we got ourselves a little bolixed up, the ground did on the procedure we used and it turned out that we left the vehicle in the configuration that we couldn't communicate with the crew at Santiago without them doing an action on their own. Which I suspect they did, they have their little calculator that goes beep and tells them when we got an AOS and I'm sure that they probably did panel command which will switch us back to the backup system and we'll regain c munications. Of course any sight where we have a UHF system, which we don't have at Santiago, we have S-band and UHF voice.

Let me ask, to follow on to that very thorough explanation Neil. This outage in the transponder, the affected transponder, is that only in the low power mode, or in both modes.

HUTCHINSON We've been unable to check the high power mode yet. As a matter of fact, that was one of the things we were attempting to do at Hawaii that we didn't get accomplished. And that's probably going to be checked before we go to bed, cause we'd like to know if we've lost that whole unit.

DAVE DUELING...HUNTSVILLE TIMES...How did reberthing on the PDP go first and second times around. How did the retention mechanism checkout?

HUTCHINSON Everything was completely normal in all of the payload deployment and reberthing operations today. As a matter of fact, in my estimate I was really amazed how smooth it went, and I think that's a tribute to a lot of things, not the least of which is of course the gear design but the training that we were able to get in Toronto on the air bearing floor and here in Ho ton in the MDF, apparently stood us in really good stead, because it took us about 10 minutes to reberth it the first time and I believe he said it took him 4 minutes to put it away tonight, and latch it up. So it appears we've got a really fine,

c od operational system there.

MORTON DEAN...Neil, if you loose your redundant communication system, how does that affect the flight plan from here on and do you have to come home early?

HUTCHINSON No. We haven't determined the extent of the loss Morton, I think. If we lost all of that transponder, I think we'll probably doing some pretty serious talking about what that means. Because then you have the other transponder, which basically is certainly not a single point failure, but if were anything to happen to it, you have no S-band communications, which of course is our last flood in terms of telemetry and command capability and so on and so forth. But it would be pure speculation, we don't know what we've lost in it yet. All we know is the low power is not working, and if the high power is working I would venture a guess that there would be no, absolutely no impact whatsoever.

MORTON DEAN...But, if you find out you've lost both, does that hard thinking include wrapping it up and coming home early, as a distinct possibility?

HUTCHINSON I don't know, I really don't. I think we'd surely discuss it, because that does have, it does have some pretty s ong implications in terms of further failures, if you happen to get one on the otherside of the comm system.

HUTCHINSON But, if you wait around a little bit you'll probably find out the other half is cooking along, cause I think probably going to check it before we go to bed.

MARK KRAMER...CBS...Isn't a transponder something which when hit with a signal responds with another signal stronger, why aren't we talking about transmitters, I'm confused. It's not a transmitter, it's a transponder?

HUTCHINSON The shuttle is a RF system is, well a simple way to put it. The shuttle locks on to the ground instead of the ground locking onto the shuttle. So signals go up and get locked on by the shuttle and get turned around. And that transponder is the transmitter for data coming down. It is the turnaround devide, a transponder as you described it exactly correctly for the S-band radar and it is the receiver for our. In other words, all S-band communication up and down, go through that device.

MARK KRAMER...And what kind of troubleshooting can you do from here? Is it a question of having to throw some switches and circuit breakers?

HU. INSON It's primarily commands from here. In fact, of course, the crew got involved in it twice tonight because our commands put us in a configuration where we couldn't command so we asked them to go back and switch us over to the alternate

s' 'tem so we could get back in and do some more troubleshooting.

MARK KRAMER...Is this the kind of failure you've ever seen before on this equipment? I don't recall ever hearing about this.

HUTCHINSON Not to my knowledge.

Paul Reesner, right here. Second row.

PAUL REESNER...Yeah, you were talking about an option of staying up another day regarding the weather. What have you been told as to what the weather might be on Monday.

HUTCHINSON We haven't got, excuse me Paul, go ahead.

PAUL REESNER...Is there some weather prediction that triggered your looking into this option?

HUTCHINSON No. We just want to make sure we have it and we were very close to it, and so we just thought the right thing to do was to make sure it was available to us, and like I said, it's going be the middle of the week, middle or end of the week again before anything is exercised in that regard.

PAUL REESNER...Okay. You have no particular concern about a fo 'cast for a sandstorm out there or anything like that?

HUTCHINSON No, and as a matter of fact, I didn't get any weather data myself today at all.

PAUL REESNER...Now, I've got one for the doctor. Earlier in the mission, Fullerton reported that when he filled up a bag with water, there was a lot of bubbles in the water. Could this be the source of his gastric distress or what?

DR. SAM POOL Could be part of it. I don't know whether that has continued or not. We really haven't asked. I think the bag as he described it contained something like 10% water. We've had individuals before in spaceflight who have had some minor cramping in the abdomen, who've taken by the way, the same medication for it. Could be a variety of causes.

HUTCHINSON A comment on the water, 10% gas in the water is not an anomalous condition and in fact, after we got to talking about it, it turned out to be about what you'd expect as a nominal amount of gas in the water. We don't think we have the (Apollo) Shuttle 2 gas in the water problem that we experienced.

Right here behind you Mike.

AL .LSTEAD...BALTIMORE SUN...Just let me do the transponder bit again. You have two transponders aboard. Right?

HUTCHINSON Yes sir.

AL SALSTEAD...You've lost low power on one of them. On the other transponder, you have both low power and high power. You have UHF communications through some stations for voice communications all the time?

HUTCHINSON Yes sir.

AL SALSTEAD...So, all you really know you've lost is the low power on one transponder.

HUTCHINSON Yes sir.

AL SALSTEAD...I'm a little bit confused as to why this gives you pause about even possibly ending the flight when you have the other transpon...

HUTCHINSON It doesn't.

AL SALSTEAD...Okay.

HUTCHINSON As long as we proved that we still have a redundancy in transponders. Now the question was asked and again, that's why I don't like to play what ifs. The question was asked by Mr. Dean whether if we had completely lost that transponder, whether it would give us pause, and yes it would because then you've got all of your S-band communications. You have to have a transponder to communicate on S-band. When it goes, if one goes, and of course it has power supplies in it, so and so forth, there are failures that could get a whole transponder, although they are very remote. When it goes, then all you have left is UHF voice. You have no command, no telemetry, and no S-band.

AL SALSTEAD...You told him if two transponders go?

HUTCHINSON Yes sir.

AL SALSTEAD...But you don't want to take the risk of operating with only one transponder. Assuming the worst, and the one transponder didn't work at all, then you would perhaps come home early because you don't want to fly around with only one transponder because you don't have redundancy.

HUTCHINSON That's correct.

AL SALSTEAD...Thank you.

Okay. In the back here from about the 5th row back on this side. Right here.

VIC RADNER...ABC...Can I follow that up please. Is there any transponder hardware onboard, any extra hardware that could replace something that might prove a problem, and second, I'm

so· ·y, what was that?

HUTCHINSON No. No there's not. We have no inflight maintenace for the transponders. 10

VIC RADNER...No replacement power supplies or things like that?

HUTCHINSON No. That's correct. We do not.

VIC RADNER...And second, do the mission rules specify hard and fast that you have to come home if you lose one transponder?

HUTCHINSON They specify a thing called a priority flight, which as you are aware, we have already accomplished, so you could interpret them to say that, but recall that mission rules are good places to start discussions as opposed to hard and fast, I've never seen one that was hard and fast.

Okay. Right, next row. Yeah, there you...

JOHN BISNEY...RKO NEWS...I understand there's been a little bit of jockeying for that precious flight time between the RMS people and the PDP people for tomorrow. I wonder if that's been worked out and a more general question, as the orbiter experiment package becomes more complex, if that's a growing concern enc ·eering versus science time?

HUTCHINSON Well I don't know about any jockeying tomorrow quite frankly. I think we are all squared away for what's going on tomorrow, so I can't answer that and as far as the engineering versus science, you know, this is the third flight of this vehicle and the engineering is high on our list of things to get done and we have one more of these test flights and hopefully, the balance between those two is going to change, it is changing. I mean that ought to be obvious in what we're doing here on STS-3 as compared to what we did on STS-1 and 2 and the scales are going to be tipping the other way. You'll probably see them tip even further 4 and by the time we get to STS-5, it will be primarily science or work deploying payloads and such as opposed to gathering engineering data on the vehicle.

Okay. Next row up. Right there...

LOU COLE...MINNEAPOLEOUS TRIBUNE...If you were to lose both of the S-band tansponders, could a landing still be made? Is that a safe landing and still be made?

HUTCHINSON Yes.

Okay. Let's go to KSC for questions now and then we'l come back and wrap it up here at the Johnson Space Center. Do we have anything from KSC?

Obviously not.

No, we do. They're working on it.

It's an hour later over there. They're a little more tired.

Okay. Have we got anything at KSC. I'm going to give you about 10 more seconds here. Okay.

Having a few technical difficulties over there.

Why don't you take questions from here while we're waiting.

Yeah, I think if we're not going to have anything from KSC, we'll have to go back to them in a minute John. Is that all right? Okay. I'm sorry, we'll have to come back to you at KSC. Okay, in the back of the room here.

PETER ZACKLAND...LONDON TIMES...Has there been any determination yet on that buzzing noise? Is it side band radar? Is it UHF?

HUTCHINSON I don't know and I don't think it's going to bother us anymore because the commander is not sleeping with his headset on. I honestly don't know and we have done nothing more except for our own comm cnfiguration.

Okay. Right up here about the third row back.

I have two quick questions, does the failure of the low power side of the transponder change any way the procedures in which you communicate telemetry and command to the orbiter and also, this evening will the end effector be disengaged from the grappling of the PDP?

HUTCHINSON The low power will have no change on how we operate. Now we are going to operate in a little different configuration but we'll operate with the rest of the S-band equipment back on the system, the string that failed and operate on the good transponder, so we will have one of these cross straps made where we're operating on system 2, NSP, and all the rest of the gear that we need, but on transponder 1.

So in other words, you'll be shifting a great deal of your capabilities on the good transponder I presume.

HUTCHINSON All.

All of it? Okay.

Okay. One more here and then (garble)

HUTCHINSON We berthed the PDP tonight. Ungrappled, put the arm away, and we'll go get him again tomorrow.

Okay. Let's go ahead and swap over to KSC now and see if they're awake and...

KIRK FRANK...UPI...I have two questions. First off Neil, we've heard a lot of talk tonight about some problems. Are you satisfied so far with how the orbiter is working and secondly, has there been any indication from the solar flare x-ray experimenters of any unusual solar activity?

HUTCHINSON Well the orbiter answer first. The answer certainly is yes. (Are they reading me all right) Is certainly yes, until we had this little anomalie with the comm system of course, we went all day today without any problems at all in the orbiter. The only malfunction I had with this entire day of very busy work was another minor problem with camera in the payload bay. One of the cameras zoom in and out has frozen up on us. This comm thing is likely to turn out to be nothing but one small part of a very redundant system and I think the orbiter is just behaving super. We've been up 4 days and there just isn't anything in it that's not behaving fairly well. I've forgotten what to say. Oh solar flare. We've been being kept aprised by the NOAA folks about the flare activity. We haven't had any m=5 events since we've been up and every day they are hopeful as you are aware some of the days we are allowed, or we have allowed our[illegible]ves to go look at flares, if one presents itself of sufficient magnitude. I can't remember whether tommorrow, I believe tommorrow is one of the days we can go flare chasing but we need something to go look at since we do have to go out of this solar inertial lattitude to go look at one, we're very careful to only go, we can only go once a day until we can get to the top sun attitude at the end of the flight where they're able to get a flare anytime they want. So were very careful to pick and choose and as a matter of fact I'm sure we wouldn't go looking for one unless he was five or better.

That's all the questions.

Okay that's all from KSC and lets go back and see if we can rap it up here with just a couple more and let these gentlemen go home. Right here in the green.

JAMES WILKERSON...BBC...Can you just outline very briefly the plan of tommorrow. Is it as printed or...

HUTCHINSON Very much.

JAMES WILKERSON...And you say, what are the most important items tommorrow?

HUTCHINSON Well we're doing a test burn in the morning and we're going to pick the PDP up and do a lot more science. Those are the two big ones. We're going to do some, remember that we're still staying in the thermal attitude, nose sun, and that's

continuing on, and tommorrow you're going to see some testing that's advantage of that, for example, this L2U burn in the morning. And more science.

Okay lets take one final question. The gentleman in the blue coat back here.

WALTER BAGGLEY (ROITERS)...When do you think you will know whether you will have the high power on the number 2 transponder?

HUTCHINSON It depends on what the team did tonight, if we finish the troubleshooting that I started before I left, we will know before we go to bed and if not I'm sure we will know fairly soon in the morning because we will want to find out if we have the other side of that transponder.

WALTER BAGGLEY...Neil, can you tell us what they are doing to try and determine that?

HUTCHINSON We will want to look at the high power mode on that transponder. And its a command from the ground and the first thing we tried to do like I said was look at another path through the low power mode that didn't work and you know the high power mode of course we were on it all day today. You know that .s what we were using for this CMI search that we ran with the PDP.

WALTER BAGGLEY...Neil, this transponder in the high power mode.

HUTCHINSON So we have every reason to believe that the high power mode is operative and is going to work when we get it turned on.

Okay and thank you for coming and we'll see you at the next one.

And other items in this crew checklist, we'll have acquisition of signal again in about 30 minutes through once again through the s-band station at Hawaii for about 4 minutes duration. The flight control team is now discussing troubleshooting the s-band problem. There are two s-band transponders on board the vehicle.

END OF TAPE

p14j CHANGE OF SHIFT BRIEFING 8:30 AM DATE 3/26/82 PAGE 1

Good morning ladies and gentlemen and welcome to the change of shift briefing for the Ivory Team. Let me introduce the participants I guess most of whom are familiar to you by now. Dr. Ellen Schulman the Flight Surgeon for the ascent team and of course Tommy K. Holloway, Flight Director and on my extreme right Al Pennington who is the Integrated Systems and Communications Officer, INCO. I don't mean his presence to suggest we have a communications problem, but we thought maybe you'd have some questions for him. Let Tommy begin with a summary of the evenings events.

TOMMY HOLLOWAY We started off last night about a couple of hours before crew sleep period and at that time we did have some difficulties with the COMM system and by the time the crew went to bed, which established a mode that was satisfactory for communications through the evening and during the evening Al and the experts worked on and examined the information that we have in the control center and have developed a plan to determine the details of what the problems were or what the difficulties were with the COMM system and I'll let him talk about that in more detail later on or at least answer your questions. At the present time we are operating with full communications capability and we anticipate that today we'll be able to determine the exact nature of what happened to us last evening and are looking forward to reestablishing all of our redundancy or at least most of our redundancy in the COMM system. I would emphasize that we do have redundancy in the COMM system in terms of being able to communicate and both with our command system and our voice with the flight crew and the spacecraft. The plan that we have for today is flight day 5 modified a bit to adjust to some propulsion DTOs that you will hear executed today by the entry team. Harold Draughon is in for the second shift of flight three and we'll do several propulsion burns and we'll also unberth the PDP again today and do some more of the PDP field mapping and EMI searches and VCAP PDP joint searches and so on and so forth. And with that I'll turn it over to you and see if you have any questions.

PAO Before we do proceed let me make one point of order here. We've got a funny with the satellite this morning and we've got some downlink TV scheduled of the PDP deployment at 9:05. So, we're going to take a kind of a 10 minute break in there and go in ectasy over the PDP deployment and then return to the press conference assuming that the questions go that long. Roy Neal?

ROY NEAL Can you be more detailed Tommy, particulary can you give us some details on when you would expect PDP deployment especially for TV and when you might be prepared to exercise with the crew whatever procedures you've figured out to try to bring that transponder back on line?

TOMMY HOLLOWAY The PDP scheduled for today is the plan that you have been given, the preflight plan, and I don't have those times at my fingertips, but they are as scheduled.

PAO Yeah, the TV plan still is

ROY NEAL You're not going to make any unscheduled transmissions. You're not going to exceed the Jack Lousma's desire to show us a little more of the United States if you could bring something up for us.

TOMMY HOLLOWAY Well today is a very busy day and I don't expect, we never there's, and Al can tell you more about this. There's quite often an opportunity to do unscheduled TV and when it comes along we always try to do that, we can't guarantee that that will happen today.

ROY NEAL How about the transponder? When do you plan to exercise that procedure?

TOMMY HOLLOWAY Well, the men that worked last evening and they worked very diligently looking at the data have a plan in place and we're going to spend about another half a day having the second shift or the morning shift evaluate that plan and make sure that in the wee hours we didn't miss anything and that we've got the proper procedures and we'll probably execute it this afternoon.

PAO Jules Bergman

JULES BERGMAN Tommy, I want to make sure I understood you correctly. You said at the present time we've got our full COMM ability.

TOMMY HOLLOWAY We have our full capability as far as communicating with the spacecraft yes.

JULES BERGMAN Both transponders are working in both low and high power modes.

TOMMY HOLLOWAY No sir I didn't say that. I said we could command and we had full voice and command capability and downlink capabilty and I'll let Al tell you just a little bit about what we know. And I emphasize that we don't really know what our totally capability is at this time, but he'll tell you just a little bit about the, what we do have and what we do know. Al.

AL PENNINGTON Yeah, basically the operational mode that we were in when we first established that we had some kind of a problem, we were running in an operational mode that had the transponder number 2 on line in a power amplifiers configuration on system 1. We do have two redundant systems, they are cross-strapable

within every LRU (or line replaceable unit). This gives us a quite of bit of redundancy in the fact that we basically then can conceive of four separate downlinks, four separate uplinks because of the the capability of the cross strapping those particular guys. The initial problem happened when we were commanding out of the mode that we were utilizing for PDP NI nominal operation on yesterday and the problem was basically that we had lost the PM downlink carrier at that time. We recovered that successfully by crew switchover and at that time everything was operational. We had at that time three separate systems. We only knew of one potential problem at that time and we continued at that time to press on with our normal troubleshooting activities as we do at Mission Control and we had exercised these procedures at length in simulations and after about 3 or 4 sights we got into some unusual situations and last night we were able with the help of our ND personnel and our own flight operations personnel to come up with what we think is a potential solution to the problems having to do with some logic on the input to the control of these systems. We have a very detailed and dedicated box on the front end of the communications system that controls it. A guy called it ground command interface logic controller unit. But, basically it's a solid state unit that has a massive amount of logic relays (solid state however), that allows us to control those guys. And that would, we think, is where we're headed to try to troubleshoot that this afternoon.

TOMMY HOLLOWAY Now what Al just told you is that rather than, perhaps what he didn't tell you is rather than him going ahead and pursuing the malfunction procedures last evening when we might have to wake up the crew, we elected to hold that, study the problem and once we get it all squared away, we'll go back in and figure out what our real situation is.

JULES BERGMAN But, Tommy, what Al is telling us is that you two are confident you've got a work-around procedure and the flight will not have to land early.

TOMMY HOLLOWAY Right now we're confident that we'll regain enough capability to have the redundancy we're required to continue yes.

PAO Lynn Sherr, And if I neglect to call on you by name please identify yourself and your affiliation.

LYNN SHERR Can you go into a little bit of detail that I might understand that would explain the nature of the exercise when you do get around to trying to figure out what happened and how to make it work again? What will you do and what will the astronauts be asked to do?

AL PENNINGTON Basically, it's a strictly matter of an operation that we will try to set up the onboard system in the same p14j

configuration we're operating in now, a configuration where we have all the capability. We'll proceed by ground command which we have total command capability of that system.

AL PENNINGTON That means the astronauts won't be involved or (they will not be involved)...his counterpart will be doing it.

TOMMY HOLLOWAY We'll try to do this on a very noninterference basis with the spacecraft and maintaining all of our voice and telemetry capability at the time as much as we can. What we plan to do primarily is exercise a configuration where we would go in, if you will, is to try to reset. That is to toggle logic on and off to see if we can unstick something that we think is on. And the reason we're waiting to later on this afternoon is we're bringing in the Rockwell Contractors to make sure that after we've looked at all these procedures, that the actual contractors on the box have looked at the unit to make sure that everything we're doing is exactly correct.

PAO Peter?

PETER ADAMS Mr. Holloway, one option you have is to land a little bit later to go ahead 24 hours. To land on Tuesday if ather is a constraint at Northrup and last night you were talking about the possibility of landing earlier if communications was a constraint. When will the decision be made just when you're really going to land and when will you have the decision on your full communications capability? When will you really have it tacked down?

TOMMY HOLLOWAY Well, I would expect and that we'll have our communications problem situation I'd rather call it a situation than a problem, sorted out by evening (this evening) so at that time we'd know our status relative to the communications problem. Now as far as landing early or late for the weather situation, that is entirely dependent upon the weather. There are people that are watching the weather continuously and as we approach the planned deorbit opportunity and, if the weather permits us, we intend to land at the planned time and as we approach that time, we will start making decisions based on weather forecasts and short term and long term on whether we ought to come in a day early or whether we ought to try it on a normal day or whether, and once we get to the normal day, if we don't like that we have the capability to go multiple days late.

AL SAILSTED Baltimore Sun This question of weather came up I believe last night for the first time at Mr. Hutchinson's briefing and I infer from what he said and what you have just s d that you have some kind of long range forecast which indicates that the weather at White Sands might not be too good. Is that true or am I wrong?

TOMMY HOLLOWAY No I don't think that's true, but I wouldn't, it's just that the weather always, you always have the possibility that you're going to have bad weather at any one particular place and if you've been in Houston the last few days, you can probably understand that. It changes regularly.

MIKE TONER Miami Herald You said you had multiple day stay capacity. Could you tell us exactly what that capability is.

TOMMY HOLLOWAY Well at the present time (well I'll back up just a bit), the orbiter is actually using less of the critical consumable which happens to be hydrogen that's used in the fuel cells to make electricity than what was predicted up to this point in the flight. So, relative to the predicted, we're actually gaining hydrogen as a function of time while we're flying. At the present time we have a capabilty of flying at two extra days without any significant powerdowns or any compromise in our capability onboard the orbiter and there's not any intentions of doing that at this time, but as far as a functional spacecraft and both as far as the consumables are concerned, we could fly two extra days at this particular time.

JULES BERGMAN Tell me, I guess what we're all interested in is the recalcitrant Transponder fails completely and you're left with just one transponder, the mission rules say, at least I have seen them, you must have both transponders operating to continue the flight.

TOMMY HOLLOWAY You have interpreted that correctly.

JULES BERGMAN Will you, (I may have answered my own question then). Will NASA continue the flight with only one transponder?

TOMMY HOLLOWAY Well as you probably know, the NASA management can waiver mission rules based on the circumstances and the situations that we find ourselves in at any time so they might elect to go ahead and fly the full duration. Our flight rules, our mission rules would indicate that we would terminate the flight early if we did not have redundancy in the fundamental COMM system. Now, I should flavor that by saying as a member of the operation team, that our recommendation would be that we select a landing opportunity that would provide us with a very orderly preparation and deorbit into the Northrup Strip opportunity and we would not do a big hurry up and deorbit and so on and so forth, but our at that point we would be looking forward to an orderly deorbit into the Northrup Strip opportunity and the NASA management at that point, based on the condition of the spacecraft and all of the overall view of the where we are in the flight and how far it was to the end of the flight, they might elect to fly additional days over what the current flight rules say.

JULES BERGMAN But one, you haven't lost the transponder yet?

TOMMY HOLLOWAY We do not know that we've lost the transponder.

JULES BERGMAN Two, you're hopeful you can get it back?

TOMMY HOLLOWAY Yes sir.

JULES BERGMAN And three, even if you have lost it, the first landing opportunity might be Monday anyway?

TOMMY HOLLOWAY Well, based on the weather that very well could be.

ERIC ENGBERG CBS What is the reason for the mission rule that requires two operating transponders? What I'm trying to get at here is what critical function would you most be concerned about in the remaining phases of the mission that the transponders are involved in?

TOMMY HOLLOWAY As much as we talk to the crew, it would probably appear that the ability to communicate with the crew verbally is the most critical thing that we have, but in fact, a ability to transmit a vector definition of the position in space of the spacecraft to the onboard computer is the most critical thing. And as a matter of fact, if we lost the uplink the ability to communicate and could still send commands, we would, spacecraft would fly around and the crew would deorbit it to next good opportunity into Northrup and we would be sending commands along the way, including updating their state vectors to support them even though we could not communicate with them.

ERIC ENGBERG As a follow up, if you lost both transponders, then you would have no way to communicate with the computer onboard or..?

TOMMY HOLLOWAY Yes sir that's correct. Al, why don't you fill in the details.

AL PENNINGTON Let me make one thing perfectly clear. The transponder loss, (sorry about that) the transponder loss that we're talking about is a downlink only. We have verified in every configuration that we have up to this point in time, that the uplink voice and the uplink command operations do work. We further have the capability just by monitoring the links that we have turning those links on and off that we do have a good uplink and with that that does give us some more confidence in the fact th[illegible] the transponder itself has a problem in the downlink. Like I said, let me point it out. It's only there.

TOMMY HOLLOWAY We didn't talk about it only being downlink.

AL PENNINGTON That's right and that's the problem we've experienced so far is the downlink which is our ability to get S band voice and telemetry.

TOMMY HOLLOWAY And Al wanted to explain this simple system. I'll tell you it's extremely complicated system and he does a good job of managing that system in the control center and keeping us with a basic capability all the time.

ERIC ENGBERG The philosophy for the mission rule is a redundant system though in essence is that correct? That NASA policy is that redundant systems and, if you don't, you come on back.

TOMMY HOLLOWAY Yes sir.

JUSTIN FREEMAN ABC What you're saying to us about transponders is that over the last evening you have tested uplink transmission with the high power and the low power side of both transponders

AL PENNINGTON That's affirmative.

JUSTIN FREEMAN And all four of those sections have accepted your uplink.

AL PENNINGTON In the configurations we've been in which is majority of the configurations that we can be in with those units, we have checked uplinked and been successful in all cases. Both uplink command and voice at this time.

JUSTIN FREEMAN Just to follow that. Your problem last night was with the low power downlink of transponder number 2.

AL PENNINGTON Yes, that's correct.

JUSTIN FREEMAN You have not yet exercised the high power downlink of transponder number 2 because that would have required you delaying the sleep period of the astronauts?

AL PENNIGTON Now let me, like I said, this system is extremely complicated in a fact that we can operate in several different operational modes. The mode that we're in right now is a high power mode and that is we're using it for pre-amplifier and power amplifier system. Okay. We're just doing it in a cross step mode. We're using systems 1 power amplifier and preamplifier instead of systems 2. We have not at this point in time checked out the system 2 preamp and power amp. We don't think that it's required at this point because that's not where we're going on our failure analysis.

LYNN SHERR As a result of the switch to White Sands and the fact that you had to bring in communications equipment there that wasn't already there, does that hurt you any in terms of landing

thinking about landing at White Sands perhaps with one transponder down? Is there anything that's missing in that case?

TOMMY HOLLOWAY No I don't think so.

PAO We'll take one more question here at Houston. Then we'll go to Kennedy. Carlos Byars.

CARLOS BYARS Houston Chronicle Seems like everytime we go through an explanation of what you're testing and what you're not testing things get a little bit fuzzier. Have you yet tried on the faulty, using the faulty transponder for a downlink in the high power mode and if so was this successful?

AL PENNINGTON Well we have experienced some difficulty we have tried the alternate mode, the various modes and we've had some difficulty acquiring in some of them that's why we're about getting ready to test them. To answer you question yes and we did have some difficulty with the other modes and now we're going to go find out why we did and we expect to regain them.

PAO Okay, let's try Kennedy Space Center and then we'll come back here to Houston.

RICHARD LEWIS Chicago Sun Times We're having some difficulty here really getting an understanding of what you're telling us. And it appears as though you do have some difficulty from what I just heard with the downlink on the high power system on the transponder number 2. Is that correct?

AL PENNINGTON The answer is no we do not have a problem with that. We are operating currently with transponder number 2 in the high power mode. That is where we are today. The strictly a matter of which system we're on like I said we have redundant cross strap systems. The problem we've had is the low power side to that transponder and we're operating on a high power side of that transponder at this time.

RICHARD LEWIS Okay. That's clarified. I though the way we heard it here you were operating on the high power mode on system number 1. But you're in the high power mode on system number 2.

AL PENNINGTON On system 2 transponder. I want to clarify that because of the way we utilize the term systems. Okay and basically we work in a string operations and there's at least 5 LRUs in this system we're talking about.

PAO LRU is line replaceable unit.

Yes sir.

TOMMY HOLLOWAY And Al can switch any one of those 5 back and forth from the ground.

Is there any relationship between the operation of the PDP, the electron gun experiments last night and this problem?

AL PENNINGTON Absolutely none.

REG TURNELL BBC Do I understand that you prefer to go to a 9 day mission if there's weather problem at White Sands in order to land there rather than come back to the alternate site here at Kennedy on the right day?

TOMMY HOLLOWAY I think that's probably correct.

REG TURNELL And we've not heard anything about the health of the astronauts this morning. Can you tell us if they're now 100 percent fully recovered?

TOMMY HOLLOWAY Well, I'll give you my impression and then I'll let Dr. Schulman give you hers. It appeared to me on the air to ground based on what they said, they felt well and they were up an[illegible]eager and were really hustling this morning and I would it sounds to me like they're in very good spirits and are feeling very well.

DR. SCHULMAN I agree.

PAO No further questions from Kennedy.

PAO Thank you. Back here at Houston. Dave Duling.

DAVE DULING Huntsville Times Considering the success that you had yesterday getting the PDP berthed and attached and everything, have you looked at the possibilty of picking up the IECM? I understand that some astronauts were in the simulator working on that yesterday.

TOMMY HOLLOWAY No, I don't believe that we're actively considering. I suppose there's always someone in our organization considering other alternatives and trying to work out something to recover a situation that we've lost, but as far as I know at this time there is no plans to pick up the IECM. We really need those cameras that we've lost to do that and there is not a way that we're willing to attempt that without them.

REE[illegible] COLLINS CBS Did you lose the lower power of the second tran[illegible]ponder at the time you switched back from high power after the PDP experimentation was done? Was that the period?

TOMMY HOLLOWAY Yes.

REEVE COLLINS But you still think that using it on high power in that regime had nothing to do with the loss?

TOMMY HOLLOWAY No, and in fact during the test and checkout that we were doing, we have successfully gone back and forth to this same mode at least three times and we're very confident this is a very good mode of operation.

REEVE COLLINS Just to followup. What will the astronauts have to do and how long will this troubleshooting thing take and will it impact anything else that they might otherwise be doing?

AL PENNINGTON The basic thing we're going to ask them to do is at the beginning of the set of procedure is to strictly set themselves up in a mode that corresponds with a mode that we're in at this time. And from that point they would only be asked depending upon a particular situation they set up to throw one or two switches onboard the spacecraft based on where we are in the procedures.

TOMMY HOLLOWAY You know I can probably answer that question more in a layman's term than Al can. He's the expert and I'm kind of the layman. Over in the control center the crew will be asked to set a series of switches up in the spacecraft so they can make, throw one switch and get the COMM configuration back to the one that we know is working. So if they are unable (you probably heard me use the term panel and command last evening), we were asking them to throw that one switch and get us back to that mode that we know will work.

PAO Al Sailsted, Baltimore Sun.

AL SAILSTED I assume, I don't want to be too tedious about this, but I assume that high power means just that, you're putting out more energy, lower power means you're putting our less energy. Why do you have the two power energy levels, Al?

AL PENNINGTON The two energy levels Houston and the STS initial program are used only primarily for operations during the initial boost phase to punch through the plume effects to the Merritt Island launch station. Later on those same power amplifier will be used with the tracking and data relay satellite we will use after it's deployment on flight 6. So those things we're getting some very good initial testing in this program while using those modes and we're also providing some testing in the PDP area. In this case the EMI modes.

Switching course completely at the moment. You had a long conversersation with the astronauts about the tiles and what happened to them on takeoff. Fullerton said there was a lot of "shaking and rattling" I think was his word, just after the SSME

start before the SRBs went off and Lousma allowed us it was about that time that things started hitting his windshield then he had to look down at the instruments so he wasn't quite sure what was happening after that. We have that slow motion pad film that shows us something falling down between the orbiter and the ET. Do we think that what that is falling down is tiles, do we think it's ice. Has anybody identified that material for sure?

TOMMY HOLLOWAY Well, I've not participated in the analyses and the activities that's been going on with respect to the tile loss and the work that's going on to understand or try to understand where we believe the loss occurred and so on and so forth. So, I'm really not in a position to answer that question.

The Tom Mosier briefing that was held Monday, I guess about the most sophisticated statement on it so far that's transcribed and is availble out here.

LYNN SHERR Tom, was there any repetition of the radar or whatever it was the noise interference last night? Was that recorded again?

TOMMY HOLLOWAY No, it was not recorded and at this point we're in a configuration where it's no longer bothering us as far as we know. The crew has not reported any problem. We believe being on the speaker boxes at night has solved the problem and as far as I'm concerned the problem has gone away.

LYNN SHERR Is there any follow through on it though? Is somebody still trying to figure out where it came from and what have you learned?

TOMMY HOLLOWAY My flight control team in the control center is not doing anything and I don't know what other people are doing.

GEORGE ALEXANDER LA Times Dr. Schulman, any other medication taken by either crewmen yesterday other than the Mylanten by Fullerton.

DR. SCHULMAN No.

GEORGE ALEXANDER No motion sickness.

DR. SCHULMAN No.

JOHN PINE REUTERS The crew were they woken up this morning when that alarm went off? That alarm that meant nothing or had they already been up using the terminals?

TOMMY HOLLOWAY Well, I can't answer the question, I don't really know whether the alarm woke them up or not. If they were asleep, they did get woke up. That thing will wake anybody up

and it's supposed to because it might be serious some day.

If nothing happens, if nothing changes from your current capacity with the transponders, do you have two of two or are you coming back?

TOMMY HOLLOWAY If I have two of two?

Do you currently meet the flight rules.

TOMMY HOLLOWAY Well, I honestly don't know yet. I've got to wait till these we do the malfunction procedures this afternoon to find out.

Well, is the malfunction procedure to determine what is malfunctioning or to provide the solution or a little of each.

TOMMY HOLLOWAY Both.

PAO You might explain that you don't just frivilously let go of a channel that's working to see if ...

TOMMY HOLLOWAY You know we're very careful about our switching back and forth and we want to make sure we really have a squared away situation before we do that because we like what we have. It's we're advised it's a full capability.

PAO The point being if you let go of that to go see if the other guys working and you come back, why maybe nobody's there.

PAO Anything else, Carlos Byars?

CARLOS BYARS Let's puruse this a little bit more. As to the impact of this situation as you understand it now on the continuation of the mission. Does it look to you like you're in a go-ahead mode, that you've got enough communications with high power low power available on transponder one, high power only on transponder two, to go ahead with the mission to it's normal continuation and normal completion or perhaps even an additional day?

TOMMY HOLLOWAY At the present time I honestly don't know that total status of the COMMs system, but right now we have a total communications capability, in otherwords I have all the functions of a COMM system and we're going to find out the answer to your question this afternoon.

PETER LARSON Orlando Sentinal Star. Could you just clarify the role that the UHF channel plays?

TOMMY HOLLOWAY UHF channel is a voice only channel up and down. Two frequencies

PAO And S band gives you data telemetry as well. In addition to voice.

PAO Anything further. Okay I guess in about 2 minutes we're going to have the PDP deployment downlinked to us. Thank you very much for you time and attention and appreciate you coming out.

END OF TAPE

PAO Okay, we have with us this evening Mr. Gene KRANZ, who's the deputy director for flight operations at the Johnson Space Center, and Mr. KRANZ is here to clairfy our confusion over the transponder situation and also speak to our plans as in terms of the mission itself. I'll turn it now to Gene KRANZ.

GENE KRANZ Okay, first of all, let me just a make a couple of brief opening statements here. First of all, I can understand the confusion from a stand point of the discription, the operations, the management of the S-Band communications systems. I think, possibly with the exception of the data processing system it is as complex a system as we have onboard the Spacecraft, and it is one like the data processing system has significant amounts of flexibility. The discussions that apparently created some of the confusion was a result of end of shift briefings, first of all by a Mr. Holloway when he had essentially run across the initial problem and had not been able to do any significant trouble shooting prior to the time that the crew went into the sleep period. And secondly, by the orbit teams shift that came off this morning, which, as far as I can determine in looking at it was more a symatics, the question of full capability verses full redundancy which I believe is where possibily some of the confusion came up. What I would like to do is to give you to our status as of now, with the communications system, and give you our interpretation of the mission rolls that pertain to the management of that system. First of all, let me describe the system briefly first. If you look at it as two systems, two basic S-Band PM communication systems that are composed of a network signal processor, a transponder, a power amplifier, a pre-amplifier and the antenna electronics. If you look at it as two separate strings composed of those elements, and then is subsequently you look at the ability to cross-strap, i.e., to tie string one and string two together you get some idea of the flexibility that this system provides. Let me describe another term here, what we call STDN and low power verses high power. STDN and low power directly takes the output of a transponder and routes it to the antenna switching electronics. High power takes the output of the transponder runs it through the power amp and pre-amp and moves it to the antenna electronics. At the current time we believe we have a hard failure in transponder number 2 low power mode. We have an apparent failure, and when I say apparent failure I'll describe that a bit further on, in transponder number one, high and low power systems. Now this systems are managed through what we call the ground interface and control logic, that's basically a logic box that routes switch commands from the crew cockpit as well as ground uplink commands to all elements of communication systems. We believe we have a logic hang up somewhere in this interface box that prevents us from exercising the full capabilities of the downlink portion of transponder number one. Now you have to look at this also as a downlink process which brings telemetry and the S-Band voice to the ground and an uplink

function. The uplink function for both strings one and string two are operating properly. So what were talking about, is the downlink portion for transponder number two low power and the downlink portion for transponder number one. Both uplink functions are operating correctly. In addition however, tied into this relatively complex system we have what we call the FM system. What I have been describing previously was the PM system. We have the FM system which takes the output of the network signal processors routes them to the onboard recorders (ops recorders 1 and 2) and routes them through the FM signal processor, the FM transmitter, and RF switch and multiplexer and again to that same antenna electronics. Both of the FM elements and this are two redundant systems again are operating properly. The FM system is that system which is normally used to acquire routine systems information, what we call our operational information system onboard the Spacecraft, we record the data, dump it to the ground during a site pass and play it back into the MCC. We do this routinely orbit by orbit, day after day through out the mission. The question of the mission rule interpretation has come up. The mission rule basically says that we should have communications redundancy, within the S-Band system we have full uplink communications redundancy excuse me, that was within the PM systems, we have full uplink redundancy, we have one downlink that is currently operable, as well as the FM downlinks where we can take data and dump it and bring it into the control center in a matter of minutes to hours depends on how long the recording interval we want. So for all intents and purposes, we have maintained both the uplink redundancy and the downlink redundancy. One further statement that you may have heard, in listening the Flight Director and Air to ground loop over there, we have elected not at this time to exercise any further trouble shooting on transponder system number one. The trouble shooting that we could do is actually remove the power from the (garble), this interface box to see if we could reset the logic, that option does exist. In a similiar fashion, we could exercise the cross-strapping operations of string 1 and 2, that option still exists. However, since we have met all of the requirements of the mission rolls for uplink and downlink redundancy we have elected at this time to not accomplish any further trouble shooting unless we have problems in transponder system number 2, high power mode, and that's basically it.

PAO Okay, we'll throw it off in to questions now. Please wait for the mike, identify you name and affiliation as we call on you, unless I do it first. John Wilford, New York Times.

WILFORD So, we're to infer from that as of this time, the mission is planned to go full duration?

KRANZ Yes, I think from an overall mission standpoint. nd I'm sure your aware you see, that we for instance daily go/no goes that we accomplish on a regular routine basis. We do this every day, we take a look at the weather, how the overall flight systems are working, whether we've met all of requirements for

redundancy in the flight systems onboard. What mission accomplishments have or not have accomplished. As far as I'm concerned right now the mission is going full duration considering the fact that we still make our daily go/no goes. And weather is going to be a very important factor in determining when we will terminate this mission.

Well then with weather that is more apt to cause you to extend the mission rather than to curtail it.

KRANZ I believe this is more subject for a dicussion about two days from now or a day from now, mainly because we're continuing to watch the weather, we've taken a look at the weather at Northrup Strip, doesn't look particularly good today. We're going to have a frontal passage there tomorrow. To me that's part of the daily go/no go process.

There will not be a landing tomorrow?

KRANZ I can't say there won't be a landing tomorrow. A lot of stuff could happen tonight. There will not be a landing tomorrow based on the communications problem I have just discussed unless something further occurs.

PAO Gentlemen of AP

Paul Rayburn, AP The as the flight rules that I've seen, say in reference to the transponders there's a footnote that explains that the references to the downlink capability and it says if there is less than one of two transponders then the earliest possible landing should be sought. Can you interpret that rule for me please.

KRANZ Yea, when you say if there's less than one of two currently we have one of two now operating. The second one we have not exercised. Those options still remain to us to troubleshoot that system and in addition as I stated earlier we still have the FM system.

RAYBURN With the failure of one of the modes in number 2 don't we have one half of 2 at this point.

KRANZ No, we have full capbility through that one transponder that is operating.

GEORGE ALEXANDER Los Angeles Times Gene does this FM system that you mentioned that is operating through transponder number 2 is that correct.

KRANZ No. That has it's own signal processing actually ien I said we actually take the output from the network signal processors and route it to the recorders and from then on it's entirely separate system from the PM system. Transponder number 1 and number 2. Entirely seperate system.

ALEXANDER If you lost the high power side of transponder number 2 you would still have an FM a complete FM system that you could operate on?

KRANZ We would have two FM systems.

ALEXANDER With their own transmitters?

KRANZ Yes sir.

JIMMY WALKER ABC Gene, what time did the first transponder fail?

KRANZ I have some brief notes here written down, a piece of paper I took this morning. I believe it was on orbit 55 over Hawaii.

WALKER Was that 8:43 pm.

KRANZ Well, i don't think in pm. I've got a MET time. I really think, I really can't even hardly read it. If you just backtrack over Hawaii 55 I think you'll find the answer.

CARLOS BYARS Houston Chronicle That's when you lost number 2 then did you lose number 1? And I'd like to follow that along with why have you elected to not to do further troubleshooting is that because you fear it could knock out you're remaining S-band capability?

KRANZ That is always a possibility. The reason we elected not to troubleshoot number 2 is one we've met all the requirements for the mission rules, secondly we're now looking at some of the hardware facilities ESTL, those type of facilities to see if we can try to duplicate the logic hangup so that any crosstracking or any further troubleshooting that we would do we have not compromise the systems.

When did you lose number 1?

KRANZ I'm gonna have to put my glasses on. I'll cross check this time for you. It looks like it was somewhere around Hawaii orbit 57.

57?

KRANZ Yes sir.

JOHN WILFORD New York Times Does this...are you going to have any degradation of the data you receive? None whatsoever.

KRANZ No sir, no degradation.

LOU COLT Minneapolis Tribune As you spoke of the potential bad weather at White Sands tomorrow. If indeed you had more communications problem would that mean that you'd use one of the alternate landing sites if you decided for communication or any other reason that you need to land tomorrow?

KRANZ No I doubt it. Basically, what we try to do is optimize several factors and I believe that for instance today White Sands were totally clobbered tomorrow. We lost the remainder of transponder number 1. Troubleshooting wouldn't bring back 2. I believe we would continue to operate using the FM data it would somewhat handicap. But again it's not an operation that is not familiar to us. We take and routinely play and use with dump data every maneuver we complete every alignment we complete. Those kinds of things we actually acquire the data, process it, look at it. So we're very familiar with those kinds of procedures. I think it would take a bit of adjustment to, but I have no doubts that we could accommodate and continue flying safely in that mode.

Okay, and another question, you are able to get everything up to the shuttle, all commands, all information, everything on all channels. There's no limitation on any of the transponders on that. Do I understand that correctly?

KRANZ That is correct, we have full uplink capability in oth transponders.

VICK HEEL...ABC...Yeah, Gene you said earlier that you had a hard failure in number 2 and an apparent in the high and low of number 1. Could you explain apparent to me, again? I'm not sure I understand.

KRANZ The apparent goes back to we are not able to route data through tranponder number 2.

In other words then,

KRANZ I'm sorry, transponder number 1, I keep getting these all mixed up. Transponder number 1, when I said apparent, it's because the end function cannot be accomplished. It is the control for those transponders that we believe is the problem.

HEEL So that then, in the other one the hard failure is an electronic failure.

KRANZ We really don't know, we really don't know.

AL SEALSTEAD...BALTIMORE SUN...If then all these alternatives are open to you such as the cross strapping you described and everything else. Is it fair to conclude then that you do not have a serious communication problem?

I believe that's a fair statement when you say serious communications problem. I like to have everything working for me all the time. We certainly have the capability of continuing the flight in our current posture. We have lost some of the redundancy. If, for instance, we would have another failure, then we would try the cross strapping options. We have nothing to lose at that time. And I tend to believe that it may work, that we may be able to recover a transponder.

PAUL RESER...ASSOCIATED PRESS...Are you able to receive voice downlink from the FM.

KRANZ No we can not. We have the UHF backup capability there.

PAUL RESER...All right, not all your stations get UHF?

KRANZ That's right. All stations but Orroral and Santiago get UHF.

RESER...Okay. On the S-band then, you have voice downlink through only one of 4 systems. Is that correct?

KRANZ You can say it's basically one of two systems, the high power, low power mode I believe, in fact, I'd probably be guessing, the high and low power mode principally refers to the, I'm wrong there. Yes, we have one S-band voice downlink that is operable at this time.

RESER AP One S-band voice downlink, and if that one goes out, all you have is FM?

KRANZ No, no, at that time we have UHF remaining.

RESER And UHF?

KRANZ Yes sir.

RESER And the FM is not voice downlink.

KRANZ That is correct.

PAO George Alexander, Los Angeles Times.

GEORGE ALEXANDER Los Angeles Times The FM is not voice down?

KRANZ Principally TM. We do have some recorded voice.

GEORGE ALEXANDER Los Angeles Times Is this module this logic circuit, is it common to both transponders one and two, in other words is it a bottleneck through which both transponder systems must pass enroute to the antenna to transmit down?

I don't really know, and I can get you that answer

after this conference here. I believe it is, but they'd prefer not to speculate now.

PAO Ok, we're going to take two more questions from Houston, then switch to the Kennedy Space Center for questions, this gentleman on the first row.

MIKE TONNER Miami Herald Since you're unsure of the exact time when these two failures occurred, I think you said orbits 55 and 57, do you know on whose shift that occurred?

KRANZ I believe the initial failure and the initial troubleshooting was done on Mr. Holliway's shift, but again, I'll get the exact time and give you the individuals who were on shift at that time.

TONNER Would flight director Hutchinson have been aware of those failures...

KRANZ Yes, he was there.

TONNER At last night?

KRANZ When you say, there's differing degrees of awareness, we first of all had another twenty four hours when I came in this morning at four o'clock, they had been working with e engineering development, the Rockwell people, as well as my flight controllers throughout the night, there were numerous commands that were sent to configure these systems, if you really take a look at all the options that are available many of these options, with the exception of the cross strapping options were exercised, you then have to sit down and break out these commands at times of occurrence, what data did we see at this time, and then try to piece it together, so there are different levels of awareness as time marches on.

TONNER But do you, You've described a very complex system and you've talked about some confusion, is there a possibility that the flight director was confused about this last night?

KRANZ No, I doubt it. I believe that possibly the end results were 24 hours smarter, and we've accomplished some further troubleshooting this afternoon, from both the spacecraft standpoint as well as the ground command standpoint.

PAO Ok, we're going to take one last question from Houston and then switch to the Kennedy Space Center, the gentlemen on the third row.

UNKNOWN To simplify it to the bare bones, if I may, because it's rather complicated. Of all the communication systems you have got originally, what percentage of them are now out?

KRANZ You'd have to break that down to each of the modes,

that question, I don't think can be appropriately answered. If I looked at it as just the two single PM links without the operating, what I'd say, without the submodes within those links, I'd say fifty percent of the system was operating. If I take a look at the submodes I could say twenty five percent is operating. But if I add in the FM systems where I've got two more, I could say 75 percent is operating. So, it's a question you have to discretely bend the question you want back there.

UNKNOWN Ok, when you said that if you added the FM and the UHF and everything, if you put all those together you've got about twenty five percent out.

KRANZ I'd be inclined to say if considerable uplink and downlink and the options that we got, it's about a twenty five percent outage.

PAO Ok, we're going to switch now to Kennedy Space Center, we'll come back to Houston, wrap up with a final few questions.

DICK LEWIS Chicago Sun Times I have a couple of brief questions, Gene. One is, in the event you lose the downlink on the PM you can, you're saying that, as we understand it, you can continue the flight on the FM and the UHF voice backup, it that correct?

KRANZ Yes, I can continue the flight in a safe fashion until I find acceptable weather at a primary landing site to deorbit. Now there may be other mitigating circumstances, but the basic intent with another failure in the PM system would be to utilize the FM system until I could get to an acceptable landing area and make sure that I have an orderly preparation for the end of the mission.

DICK LEWIS My second question is based on some confusion about the time when the, these partial transponder failures, we have the impression that the number two downlink on the low power downlink failed some time around orbit 55 or 57, is that correct; failed at the same time?

KRANZ No, they fell at discretely different times, the initial failure was transponder number two low power.

DICK LEWIS And that was followed some time around orbit 55 or 57 by number one, is that correct?

KRANZ Yes, that's correct. And I'll confirm these times or at least the orbits, and I'll get the specific times in through the commentator over in the Mission Control Center and get you the specific times.

DICK LEWIS The reason for this question is that the commentary overnight indicated that the number one transponder was operating

without any difficulty all night, that the crew shifted to that transponder, that's in the commentary, is that correct? Or is the commentary incorrect?

KRANZ I really don't have the commentary in front of me, the status has not changed since orbit 55 and orbit 57, that is that I think is the salient point of this discussion.

DICK LEWIS Orbit 55 and 57 was yesterday, was it not?

KRANZ Yes sir.

DICK LEWIS Thank you.

PAO Ok, no more questions from..ok,wait a minute we have another question from KSC, would you identify yourself?

JOHN WOLMAN AP The weather is terrible out in New Mexico, you see to whether or not the landing weather is related to your decision to press on to Monday?

KRANZ Say again please, I was distracted during your question, could you give me that one please?

JOHN WOLMAN We understand that the landing weather is going to be awful in New Mexico perhaps until Monday, I'm wondering w ther or not the decision to press on until Monday would be a radio problem after your people are saying most of the goals of the mission have been accomplished, is related to the bad weather in White Sands?

KRANZ Well, weather is always as we approach the end of the mission is one of the principle elements of making a decision when we want to terminate the mission, and again I indicate the entire preparation for deorbit has to be an orderly process, the crew, the controllers, everybody working the mission, including the people for landing site have to be thinking about deorbit, entry, landing, rollout and then the vehicle turnaround activity. Weather is one of the principle considerations there, overall systems status is another, crew status is another, readiness of network and the ability of everybody to support it. All those factors go into making your mission termination decision. All things being equal, we intend to fly through the planned mission duration. If any one of those parameters is going to be favorable on one day and not favorable another, we could come in a day early or maybe even go a day late, it's a question you have to find that set of conditions which optimizes the chances for successful conclusion of this mission. And that's true of any mission we've ever flown.

KSC PAO No additional questions from KSC.

JSC PAO Okay will we'll come to back to you, in the meanwhile I've been passed a note from the control center which I

believe partially responds to one of your questions, which says, flight director Neil Hutchinson was aware of the first transponder problem. It happened on his shift, the second problem with the transponder occurred on the following shift which I assume is Mr. Holloway's shift.

PAO So lets take questions now gentlemen on the fourth row there.

(GARBLE) To follow up the Cape's question. Had the weather been okay for tommorrow at White Sands, would you have aborted the mission today in view of the (garble) tommorrow in ideal conditions at White Sands.

KRANZ Depends on what the weather would be the following day. No I wouldn't plan on aborting the mission tommorrow, unless the weather the following day would be unexceptable for what I would say is a good mission termination.

JIMMY WALKER...ABC...Gene, I'm confused, in the transcript at 10:00 p.m. last night, the PAO says the vehicle is presently configured using transponder number 1.

KRANZ That's very possible, that could have been part of the troubleshooting process. Okay it depends upon, no it depends u' n when you snapshot these transcripts again I cannot establish what I would say is the factual accuracy of all the transcripts that are used in the mission. The situation from the time that we had the initial problem, with the STDN Low mode on transponder number 2 and then the subsequent is somewhere during the troubleshooting process, we appartently had a failure of transponder number 1. That's situation has not changed in the pass, well since rev 57, or orbit 57. Now we're a heck of a lot smarter twenty four hours from now. (garble) we have accomplished additional troubleshooting.

CARLOS BYARS...HOUSTON CHRONICLE...One technical thing of sorts and that is I would like you to clarify this about the FM systems which you have two is that correct, and how many UHF systems do you have and are these separate distinct discrete systems?

KRANZ Yes we have a single UHF system. We have two FM systems. And these are separate and distinct systems.

CARLOS BYARS The transcripts by the way from the change of shift briefing indicate responces 180 degrees out from what we have been hearing this afternoon and from you sir. Well that's change of shift briefing sort of thing

KRANZ Like I said. It's very easy to mix up transponder number 1 and 2, cross strapping PM systems, FM systems. It's tough. You see me referring frequently to 1 2 cross strap and that kind of stuff up there. It is tough, it is real tough. The best guys and probably the most knowledgeable people in these systems are the INCOS. That's why we have them specially positioned in the Control Center for that purpose. Boy, that's a tough position to train for.

PAUL RESER ASSOCIATED PRESS I hate to beat an ailing horse, but given that the weather was pristen pure and perfect today, tomorrow and in the foreseeable future at White Sands and given that you have the radio conditions that you now have would you, in fact, recommend the mission to continue as first planned?

KRANZ Okay, I would recommend the mission to continue.

PAUL RESER ASSOCIATED PRESS Okay, were there those who did not so recommend in your discussions?

KRANZ No, we haven't had any, what'd I'd say is significant discussions, relative to early mission termination to date in the Control Center. Again, I identify, we're still trying to find what the problem is. We're working very well with very hard with the hardware. We would like to troubleshoot and recover the full capability in the systems. We have not given up that transponder yet and for all intense purposes, I believe, we have met the intent of the mission rules.

CHUCK WOLFE KIKK RADIO Chuck Wolfe, KIKK Radio. The FM system. Does that going to that kind of a system, does that slow down the information coming in, cause you have to go to the recorders? I mean, what's the turnaround difference between the PM system and then going to the FM system?

KRANZ PM we'll be getting real time as it happens with just momentary delays for downlink processing and data display. The FM system, it's hard to define what the time delays could be. It could be as short as a few minutes. For instance, you could take a site pass, record the data during the early portion of the site pass, dump it towards the tail end of the the site pass, get it in the ground, play it in, you're talking in the order of minutes there. So it would depend upon where we were in the mission, what we doing at that time, what objectives, did the crew have any problems, was there any troubleshooting and work, that type stuff, which mode we would operate in. The most efficient mode is to basically dump through an entire site pass. If we have a problem with PM transponder we would probably adjust that. But again, this is a procedure that we exercise offly a lot in the Control Center.

AO Any other questions? Vicky Leonard, ABC.

VICKY LEONARD ABC Hi, two things. One, I still don't quite

understand if there's a logic problem with number 1 and you don't get the same thing leaving the system as you sent into it. How you can still use it if there's a logic problem of getting answers I mean that's really very basic. And the second thing is, is it all of us and our imaginations thinking that this is a critical situation and in fact, you never considered it a critical thing to come home early about?

KRANZ Let me answer your question. Let me see if I can remember the first one. You're talking about the logic problem, first of all we are not using transponder number 1, we're using transponder number 2, hi power. I'd have to go back to the exact transcripts to figure out where we were during that period of time and I honestly haven't had the time to do that. Secondly, the mission rules as are stated talk about confirmed failures in systems. We have still met the intent of the mission rules and basically, the mission rules are for very discrete cases, Okay. You don't, I mean if you tried to separate, for instance, communications systems and write all the possible missions rules for all the possible combinations of things that could happen, you'd have a book that thick. The key thing is to identify intent in mission rules, and basically, what we want in the mission rules is duplex communications up, two communications loops going up, two communications loops coming down. We have met the intent of those rules in our current situation. We'd like to recover additional redundancy. We don't feel it is necessary to pursue that until we better understand what may have caused the problem to occur.

PAO Does that answer your question?

LEONARD So, basically it was never critical then and you didn't look at this problem and say we've got it and bring them home right away.

KRANZ No. No. No. No.

LEONARD Never that

KRANZ At no time. As I said before, whatever you're going to do it has to be orderly, has to be well planned, everybody has to think entry, get their mind adjusted to the entry process. The whole team has to start moving along that direction and we haven't done that at all. As you see today, the entry team's flying shift.

PAO Craig Covalt, Aviation Week

CRAIG COVALT AVIATION WEEK Gene, all things being equal Monday, what issues will you have to examine on entry with the radio situations you have or the telemetry situations you have on areas over Guam and just that a blackout.

KRANZ Retaining the full capabilities we've got right now I don't see any hot issues. I believe, that in a precautionary sense, we're going to make sure that the NAV state stays tuned up, that the IMU alignments are virtually perfect. We're going to make sure the fuel cells are tuned up and those kinds of things. It's more or less the housekeeping things.

PAO Any other questions? We have no other questions, we're adjourned.

KRANZ Thank you. I hope I didn't confuse other people further because clipping these 1's, 2's, high, low, and that kind of stuff I can't wait to see the transcript of this one.

END OF TAPE

p16j CHANGE OF SHIFT BRIEFING 3/26/82

Hello again, Change of shift briefing with flight director Hal Draughon. And in the fervent hope that Gene Kranz's lecture in COMM 101 settled all of the questions about the s-band system. Let's move on to going over todays log out of Hal's flight director log here. Hal.

DRAUGHON Okay I'll try to just give a brief recap of the major activities that we accomplished today and then we entertain any questions you might have. The first thing we did this morning right after crew wakeup was change the computer configuration onboard. In support of the planned RCS maneuver, it was called a L2U burn, that means there was a left firing jet on the number 2 manifold and there was a upfiring jet. The objective of that test was to test the performance of one of the RCS thrusters after it had been in a cold environment, the burn duration, magnitude rather was 32 feet per second with approximatly 20 foot per second in plane. In a positigrade direction in order to change the orbit just a little bit, that burn and everything about it went absolutely normal. Directly after the RCS test maneuver, we activated the RMS, went over and picked up the PDP package and for the next eight and a half hours roughly today we operated with the PDP in a deployed mode. The activities we were persuing were first of all a B-field mount. I didn't break these down by times but I could if anybody needs them, then on the EMI search, which is an electromagnetic radiation, checking that environment around the vehicle. There are two types of those, one where we look specifically at those known sources of the EMI, looking directly over a UHF antenna, directly over tacan antenna, directly into one of the s-band systems and after we've completed that, there's what's called a generalized EMI search where we make just almost, like mapping out of an antenna pattern, if you're familiar with that, and went generally around the periphery of the payload bay looking for, and the objective of that is to be able to define to future uses what the radiation patterns are in the bay that their packages might be having to live with. After the EMI search, there was a thing called a joint ops which was taking a PDP and putting it into the path of the v-cap, the v-cap is the guy that accelerates electrons and there are a couple of objectives associated with that particular one. One of the instruments on the PDP can detect the charged particles from the v-cap and we were trying to map exactly what the paths were as these electrons were leaving the spaceship and that path varies as a function of what the magnetic field orientation is that your in at a particular time and that of course varies depending on whether you are in the orbit. So we went through that, we went through eight sequences in that particular set which were probably the most, from a laymans point of view, the most exciting, the most interesting set of things we did today. The first six of those were in an RMS auto mode, we had predefined a set of points that we wanted the RMS to take the PDP and put it in an attitude and the location, it would sequence it through those points, it would go

to one then pause, and then the crewman would take data for a certain amount of time, hit a procede button, it would go along to the next program step. After they had done that and those were predefined before flight and by the scientific community based on where they thought these particular streams of particles would go. After that we did two manual searches, that the crew had practiced, where they just take the arm and manually search for the beam and they have a meter onboard that measures the intensity in electron volts that their detectors are detecting. And so they can tell when they have found the beam and when they've gotten into it and they go out the other side, just by the analog measurement their getting out of the instrument. And they were quite successful in fact, I don't know what their scaling of the units was, but in the automatic modes we were getting readings of something like 40 and I know Gordo at one time got up to size 72 and so he was doing a better job of chasing after and finding where the beam was then they had predicted in preflight and you'd expect that. He could adapt and they would be a little off and it would move, he found also it would move from one time to another it would be a bit further down on the longeron. But the scientists were extremely pleased with that particular set of data, and I think the PDP scientists were all day long just jubilant with the amount, the quantity and the quality of the data that they were getting. Follow that up with a wake search which again is looking at the magnetic fields surrounding the orbiter, again trying to define for future users what the magnetic fields are that they're packages would be riding in. Then we added in a test that had been dropped out, first time it was dropped out was in flight two and then it was dropped out from this flight two days ago just because of some other problems that were incurred and we're getting behind the time line. The RMS has a number of modes the most rudimentary mode is a thing called backup and if any of you have seen the RMS panel, and one right in the center of the bottom, there one little extra panel that kind of looks segregated from the rest of it, from all the meters and all the other digital readouts and what not. And that is the backup controls, there is only three control devices, it uses a different power source from the ship, its a main B power, versus main A that all the other primary modes use. It is not computor supported in any mode, the crewman, its much like, in the spaceship in driving with the RCS stuff which you think of as a direct mode. He's physically going straight from his hand control out to the motors of each of the joints. And we wanted to prove that it is possible for one of the crewmen to manually stow the arm. We don't anticipate doing a lot of extra, a lot of work, going out planning to do work in the backup mode, that's mostly a save the arm kinda thing. But he did a cradle in the backup mode and it went very well, in fact he got it almost cradled and it had gone so well compared to the amount of time that we had allowed it, and we really hadn't allowed it but about 20 minutes. He took the thing back out again and had Jack take pictures of him doing it all over again. So that went very well and we were glad to get that behind us, we would have rescheduled that for flight four had we

not. The crew generally today were, if you have been listening to the air to ground, they're in much better spirits, they're beginning to, its very evident by listening to the kinds of little asides, if you know them, listening to the kinds of little asides that they throw in, that they begin to quip with us, little smart remarks, little jokes that they toss along. Gordo got in one good one on Jack today. We were coming across Camp Lejuene I believe, and Jack being a Marine he said he sees the marine airbase down there and the marine airforce and Gordo says yes I see both of them. So you can tell that when they start that, you haven't been hearing much of that the previous days, you can tell when they start that kind of thing they are feeling a lot better. And its very evident there was absolutely no indication in the latter part of today that there was any fatigue. They did everything asked of them in the latter part of the time line this afternoon without a single hitch. I don't know of a single thing that the crew missed today. Right now the vehicle is back in the cold sun attitude continuing the 80 hours of nose sun thermal testing that we had planned to do. The orbit right now is 126 by 134, that will decay down to some lesser value. I could give you a wild yes, but I'm sure Terry or someone could get you the right number if you need it. It will decay a few miles from that by the end of the mission. Gene's talked to you about the transponder problem that happened on the shift prior to mine. What we did on my shift today with regard to that particular test is that we did a little bit of rudimetary testing on transponder number 1. We did not do an exhaustive test of it, we had so much RMS activity today in days 3 and 5. I think Neil has told you a couple of times days 3 and 5 were the biggies for this flight. They were really just shoehorned full with activity. And there wasn't much time to work in stuff. We tried a couple of things and didn't learn anything useful from them so we are about where we started as far as checking out the transponders is concerned. The other failures I don't know if you know about yet, the Goddard, Goddard has, there are two tape recorders dedicated to the OSS-1 pallet data. They are called the Goddard number one and the Goddard number two tape recorders. They are indeed a redundent set of recorders. Goddard number two has failed, if nothing happens to number one there will be no loss of data from the flight, so that is going right along. The milestone they still have in front of them is to get the top sun data. Most of the guys that have been running to date, really have a lot of good data. The guys that need the top sun attitude, the guys that have the sun sensors haven't had hardly anything yet, because we just haven't been at the attitude that they need. The N2 system you've been told about a small leak that we saw show up yesterday or the day before, its started and ran for a few hours, and then it stopped, it again yesterday or yesterday morning I believe, it started again. It was leaking early on our shift and we started a few procedures to try and isolate the guy. The second configuration we tried stopped the leak but it didn't uniquely tell us what location it was at. We then tried one more configuration leading up to about an hour and a half before we put the crew to bed. We think its into system

2, there is a system one and a system two that has tanks, regulators, just a main stream of equipment lead and then another redundant path exactly like the first one. System 2 it appears is the one that has the leak. Its conceivable that, well we haven't conclusely proven is that there isn't also a leak in the other one. The leak rate is one that, it would not be a major concern to us as far as flight duration is concerned. We put them to bed on system one, because the leak rate is so small that even if there is one, we could afford to feed it during the sleep cycle and we'll get one more piece of data that way. The only other thing that we worked on this particular shift is some of the details, you know about the APU 3 problem during ascent, we worked on defining some of the details of how we'll go about checking out that APU. I talked about that briefly the last time I was over here if you want to hear some more details about that, we can go into that. The only other piece of hardware worth mentioning I guess is the IMUs which are, only because they are working so well. The last alignment that was scheduled for about an hour and a half before sleep was just deleted. We just didn't need it. It was just perfect. That's roughly a recap of today's activity.

Okay identify yourself and then please wait for the mike. Morton Dean, CBS.

MORTON DEAN...CBS...Getting back to the transponder issue, as they used to say during Watergate, what did the astronauts know and when did they know it? Did they know anything of the major problem or not. We certainly didn't hear anything.

DRAUGHON No and COMM is one system that the astronauts, either it works or it doesn't. And they have very limited insight to it. We usually try to keep something on line thats working and when we understand a failure, we'll summarized it to them, but we generally, its not like the RC, the control system or something where when they go to try and use it and it won't work for them. We generally don't get into a lot of detail in discussing COMM configuration or COMM problems until we can tell them this particular piece of hardware is hard failed and we're not to that place yet and we haven't briefed them in any detail on that problem.

MORTON DEAN...When did you folks actually know that there was a problem of three out of four, rather than one out of four parts of the two transponders.

DRAUGHON I really don't know. It was known when I came on shift this morning that all of system one was having some difficulty and the only thing that was really, and in fact I think its still true, the only thing we knew for sure or think we know for sure is that transponder two the low power mode, one of its modes, we think we've done a through checkout on it and it is broken and not recoverable. Transponder number 2 high power mode is the one that we have been flying on all day today. The system

that you really don't know the status of yet is transponder number one and its strings and the different ways you can hook it up.

CARLOS BYARS...HOUSTON CHRONCLE...Lets touch on the matter of consumables for just a moment. You have been trying to stack up enough excess that you could comfortably go another day without cutting in to the 24 hours surplus that you're supposed to have. How's that going.

DRAUGHON It's going quite well. We could fly three days longer than the planned 10 days mission without a problem.

Front row, Associated Press here.

PAUL RAYBURN...ASSOCIATED PRESS...Did I understand you correctly to say you are not sure that there is not a leak in nitrogen system number 1 and where was the leak that was reported the day or two ago. Which system or the possible leak?

DRAUGHON The reason we're not sure is that when the leak was first seen, the two systems are manifolded together. You've got two tanks in system two and two in system one but those two pair are manifolded together and while you were feeding that manifold of four tanks into a regulator, it was leaking. And the configurations that have been checked since then have not uniquely isolated it down to just one of those systems. We kept it all off and the leak stopped. So we know the leak is not in either of the tanks sets. We know the leak is not downstream of the last regulator. Its somewhere between the second valve from the tank and the regulator. And there is a check valve right at the main bulkhead where it goes into the pressurized vessel, into the cabin. So its somewhere in that line. But whether or not its, whether or not there's a complementry, if I had a blackboard I could show you, I think it could tell you maybe you had one in both but you just don't know until you finish this other test.

Are the leak that was suspected a day or two ago. What did you know about where that one was.

DRAUGHON Not a great deal. It's the same leak. It's the very same leak. Yes.

CRAIG COLVALT...AVIATION WEEK...I'll take you up on your offer on APU 3 checkout scenario and also while you're at it, I've been sitting here all week wondering why you've got your elevons up so high. You might tell me what I missed there on launch day to put those up.

You mean after you saw the TV on orbit.

Yes.

SPACECRAFT I was surprised too. And we didn't do it on

purpose, its just where their modes take them and they're not constrained to be any place so that's where they go. We do a thing when we bring the system back up with hydraulic power on them rather than just bring the hydraulics back on with the zero command and slam the boards back to wings level. The first thing it does as part of that start sequence is that the software goes out and reads the feed, position feedbacks, and then sets the output commands equal to the position feedbacks so that you crank them up and they're there and then it slowly brings it back. So the first thing that happens when you bring up the hydraulics is that it will slowly bring everything back to trim.

You didn't get them up like that on STS-1 and 2 as I recall.

DRAUGHON It varies. Sometimes you sit in the hanger, sometimes one board will droop. And it just varies.

On the APU now.

DRAUGHON On the APU, the thing that we need to do there, the uncertainty, we know the APU are on, no reason to doubt that the APU will run. The uncertain thing about it is the cooling, if the APU, if the water spray boiler that cools the lub oils and the APU doesn't function correctly, that APU can be used comfortably for about 10 minutes. In my mind we clearly need to ascertain whether or not that boiler is going to work or not prior to reentry. If I didn't find that out, the only sensible thing to do would be to wait until about 80,000 feet and bring that APU on and have it for landing, which is where most of that activity is with the elevons. If you bring, if you say well its going to work and you crank it prior to entry, you may just wind up about MACH 15 or so having to turn that APU off. And then you had it running when you didn't really need all that help. So we do a flight control systems check out on orbit right now we're planning to check out APU 3 during that flight controllers, use it for the flight controllers systems checkout and we'll accomplish two things at one time. We'll validate the APU performance and we'll do the preflight on the aircraft like we'd always do prior to reentry.

GEORGE ALEXANDER...LA TIMES...If this question was already asked before, forgive me but I just got here. What scenario can you devise that allows the high power setting on transponder 2 to operate while knocking out low power number 2 and high and low number 1? Some kind of path way has to be opened for number 2 high to keep on operating. What scenario..

DRAUGHON Its a complicated system and one that has a whole bunch of serial boxes in it that has lots of redundent ways of lashing together, and I really can't answer your question.

I...I'm sorry, there...

DRAUGHON I would be surprised if there is a single failure that could exhibit the results that you just described. I don't know of one but we have not done a complete checkout on Number 1 by any means.

.....But all the troubleshooting that's been done today has not given you even a hint as to what the problem is?

DRAUGHON No. The testing we did today eliminated some potential failure points. They did not check out. That transponder is interfaced with one of the NSP's at all. You know, there are several modes we never even got into and the reason was we were doing so much work with the arm, we just didn't want to impact the RMS work.

.....Jules Bergman, ABC.

JULES BERGMAN ABC I have two questions. One, is there any hope that either of the S-band transponders will come back completely?

DRAUGHON There's hope Jules. I don't know, I can't quantify it for you.

JULES BERGMAN Could it just be an anomaly is what I'm saying, or is it a whole circuit that's gone.

DRAUGHON You really can't say. There's just not enough data known. That system has a lot of different configurations you can put it in and we have not looked at all of them.

JULES BERGMAN Aren't the TRW specialists here to do that?

DRAUGHON I don't know how many of the subcontractor are on site. There are a number of specialists in E&D and in flight operations that are quite familiar with that hardware, but they need some time to put together a good rigorous check.

JULES BERGMAN And the second question is, will you lessen the reentry angle because of the lost tiles?

DRAUGHON Absolutely not. We have looked at, with the stuff, with the history of the tiles prior to flight 1 and then the history on flight 1, and whatnot, we have spent a lot of time looking at tile losses and we're quite familiar with where the temperature profiles are and what can be done to shift entry. You got to encounter the heating somewhere to get the drag to reenter, so you got to take the heat, but there are some things you can do to manipulate it. You can take heat off the body, for instance, but if you do the elevons going to get hotter. You can put heat at the back of the vehicle but you got to take it on the front. But we have looked at all those for this flight, and with

the tile problems we know about and have finally concluded that we plan to do nothing different. There is no requirement.

JULES BERGMAN...Do I understand you correctly. You're saying that if you lessen the reentry angle to 45 degrees from 43, for example, that you're going to transfer the heating from the body flap to the elevons.

DRAUGHON That's not the way you would do it, and you wouldn't change the body attitude of the vehicle. What you would do, you've got to keep the pitching moment right. You've got to keep the same attitude alpha angle of attack for the vehicle. What you've got to do is change a pitching moment. If you think the body flap, which is normally down, has lost some thermal protection, then you might say, well I'll fly it a little further up, but if you do that, then something has got to keep the pitching moment equal, so the elevons have to come down. The body flap comes up, the elevons have got to come down. That moment has got to be there. So all you do is you transfer the heat that used to be going to the body flaps and they're going to the elevons. It would be not a wise trade to begin with, because we can enter with the body flap just about torn off the vehicle. That's a fact. The elevons are they guy you've got to have and the reason is not for the elevon control itself but also the most critical control aspect of this vehicle right now still is the lateral control, which the elevons give you lateral control by differential elevons ailerons down low so you wouldn't want to jeopardize the elevons to help the body flap. That has all been looked at and the conclusion has already been made that we will fly the same body flap schedule which is the name of that game, where is the elevon going...the body flap going to be all the way through entry. It does change. It's going to be the nominal one that we're planning to fly.

ROBERT COLLIN...CHRISTIAN SCIENCE MONITOR...If you lost all comm, could they use those little hand computers to come in?

DRAUGHON Yes. Yes, there are adequate data onboard for the crew to reenter using that computer. In addition, another thing that we routinely do, of course, there's a vector already in their vehicle, and we keep them appraised with the vector to nav state that they have onboard at any given time. We let them know continually how long that one is good enough to enter on.

ROBERT COLLIN...Are these little hand held things accurate enough to actually get them down?

DRAUGHON Yes.

.....Carlos Byars...

DRAUGHON You won't, you may not get down where the runway is, but you'll get down.

ROBERT COLLIN...Is that good enough.

DRAUGHON If you can see it, you can (garble) to it I guess. The main thing is to get down to where the seats work, and then you get below deck and you hope there's a runway there. But you know, you're talking about way out stuff. In the routine maintenance of the thing, the way you worry about extra reentry is, we give them things we call pad messages. They're just listings of deorbit times and the site, which way the initial bank angle is going to be, and the range. And a few words about the weather. With those data and if they know that their vectors still good, you can come down and you'll land there. If you go, the reason we have the calculator and the reason you use that other mode is that there are times when you can have some massive failures of a large hole in the cabin, you just can't decide, well I'm going to reenter right now, crank up the engines and come home. You've got to be, you have got to be about 4,000 miles from where you want to land because that's the way the vehicle works. That's the way entry guidance works. It's going to fly that entry range so if you don't do the reentry maneuver at the right time, when you get to the bottom, you're not where you want to be. So, if you get a hole in the cabin and you can't stand to wait to get around, say you were trying to land at Edwards, if you can't stand to wait to get around to about Yarragadee, about Australia, when you do the maneuver, then you're not going to land in California. If the you do the maneuver over the U.S., you're going to land back over at the Indian Ocean some place. It's just the way the world turns, so you like to have that, you've got to have that capability for the hole in the cabin case, and catastrophic, real short, crisp failures. But just for losing comm with the crew, they know how to do that with the other data and land at a landing field.

.....I'd like to ask you again on the communications problem. You've done very little (garble) troubleshooting today. Do you plan to get into that more heavily tomorrow with making some of these cross connections and things and how far will you try to go with that, or are you simply going to wait until you get it back on the ground? Lets see...

DRAUGHON I would expect them, tomorrow is one of the lighter flight days. In the morning, we've got on the shift that I've got early in the morning, we've got quite a few additional test manuvers checking out some short pulse firings of the engines again. But in the latter part of the day, there is some free time and some time could be made available and I know that the engineering community are already looking and trying to define useful and meaningful tests to run. If they do, they'll be scheduled and they will be run.

.....Was that logic box included in the testing today?

DRAUGHON The GSUL?

.....I believe that's what it's called, I believe it's called logic box and perhaps performs some routing...

DRAUGHON Yes. A portion of it. What that box does is, it's one of the major components that does the configuration of switching these things in a different configuration. Changing which one is talking to which ones. Putting the chains together and those modes that we checked, yes, that part of the GSUL was checked out today, but it was not an exaustive test. It was one stateside pass. That's all we had time to devote to it.

.....Okay.

PETER ZACKERMAN...TIMES OF LONDON...I may have missed this. I'd like to know if precisely what channels of communication now exist between here and the shuttle and also I'd like to know whether you have been emphasizing the shuttle's capability for an extra 2 or 3 days in space because of the fact that the weather forecasts for White Sands are not too good for the next few days and therefore you want to emphasize if you can keep it up.

DRAUGHON Okay. I'll try to hit both of those. The communication that is available, we have seen no problem with all of the uplink modes, so we've got UHF and 2 S-band voice links and the digital command link going up. Everything we normally have.

.....Is that one digital uplink?

DRAUGHON Two.

.....You've got both?

DRAUGHON Two, two S-band digitial uplinks and UHF voice. The part that is not validated, or that we've got to work on, is the S-bands downlink, and that's the PM part, not the FM signals that come down. If we were to go check out this other transponder and found out that surely both of its PM downlink capabilities are gone and then we were to lose the one that we are now working on, there is still a clumsy but viable way to fly this aircraft, and that is the digital PCM data is still generated by the PCM units onboard. It's still going to the tape recorders and you'd dump those recorders in view of the FM links. So you could record data and dump it. It's kind of clumsy and it's not what you'd like to do, but it's safe enough to fly with if all you're trying to do is get to Northrup, another day to land. Your other question had to do with why we're saving consumables, and the answer is that we are saving for that, just because of the weather. We're not saving them because of this comm system problem. The weather at Northrup that I looked at this morning says that we had (garble) weather tomorrow and the next day that if we had to land in we could, but we'd really rather not. The weather prediction for Monday is that it will be quite acceptable.

.....So the follow up on that is that if the weather tomorrow and the next day were acceptable, you would prefer to land early.

DRAUGHON No.

.....Because of the communications.

DRAUGHON I'm not sure that's true. That's the trade you'd have to make, but it's not a black and white,...

.....Would you say that the weather is a factor in your decision not to land early.

DRAUGHON All those things are a factor. Another factor is that we have not gotten the guys that want it, all the top sun data, any of that data, you know, there's a set of people that are right in this bay that have accomplished essentially almost nothing because they're all sun looking guys and we don't go to top sun until the middle of tomorrow. So you have got to weigh all of those things.

.....So this time, the data is the important...

DRAUGHON The data is important, the fact that we need the test time on the vehicle, we need the top sun for a thermal test that was also a thermal test attitude. The thermal guys need that data, the scientists need that data, we want to see this vehicle fly for a duration as long as it's safe. If we thought we had to enter tomorrow, we could. Those winds are, they're 15 knots gusting to 25,...the report I saw, the last one I saw, and we've got 2 runways there, we could find one that had an acceptable crosswind component and land on it if we needed to.

.....Could you just give me just one percentage of the communications available. Somebody said that you have 75%. Do you think that's an accurate figure?

DRAUGHON I don't know how to quantify that. Yes, I guess so as far as what the total capability of the vehicle used to be functionally, as long as nothing else fails, it's doing everything that it could ever do. It only gives me one PM downlink at the time anyway. It's still doing that out of that one transponder that I have.

.....Thank you.

.....Paul Rayburn, AP.

PAUL RAYBURN...AP...A couple of communications questions. Is the teletype that you use to send messages to the crew, is that independent of the S-band UHF and FM systems and the other question is, is that thing working in a downward direction as

well.

DRAUGHON No. It is not independent and it does not work in a downlink. It works on the, it can work on either uplink S-band frequencies. We have it set for S-band, what they call S-band system 2, but we could put it on system 1 if we chose to.

PAUL RAYBURN...I'm sorry. One more question. The delayed FM downlink, could voice be recorded and sent down on that or only digital information?

DRAUGHON The voice can also be recorded and routinely is. Commentary on TV, for instance, you routinely see that.

TERRING LUSKY...CBC...What, if anything, can you tell us about why these communications failures have occurred, and what can you tell us about whether they might be fixable?

DRAUGHON I really can't tell you anything till I know what they are and right now we honestly don't know what they are until we've checked them out. The only way we could fix them would be to lash these systems up and if you could find out which box in each string is broken, this GSUL, what it does is restring things, it puts them together in different segments and perhaps you can put them together in a chain that now works by picking one out of this link, one out of this one, and work your way through it, but you can see that that's a fairly tedious thing to sort out.

.....John Wilford, New York Times.

JOHN WILFORD...NEW YORK TIMES...A question for Terry. Could you shed some light on why until 3:10 when you made your announcement, we were not told the full extent of this problem?

DRAUGHON Oh, I guess I could back into that thing we used to use back in Apollo. That didn't happen on my shift, but we ran the thing through the INCO and I checked with the flight director on the current status of the S-band transponders and they all blessed it and that's what I went with, because I was getting a lot of heat from over here on what the current status was, so that's what I went with and I had not read the transcript of the earlier press conference where apparently it didn't really surface that we had parts of the second transponder unusable.

At the morning press conference, it was understood, and the transcript shows that transponder 1 was fully operable and the high beam on transponder 2 was operable, but the low frequency went out during the PDP, yesterday. So could you, I'd like to follow John's question, you know, could somebody here establish when transponder 1 was unusuable and why we weren't told.

DRAUGHON Well, I don't know if I can help Terry out or not, I wasn't there either because I was off working on some other things, working on the, you know I've been off shift for the last 3 shifts. But, I do know that if he was talking to the guys on the console, I talked to one of them just before I left there, because I figured you guys were going to be interested in this topic. They were not then, and they still are not convinced that that transponder is deep six'ed. They think that there's still some numbered, number 1. Number 2, the one that we are now riding on in high power mode. They believe that the other part of that, the low power mode. They believe they have adequately checked that out and that we're not going to get that back. But the other one, transponder 1, they don't think that they have adequately tested it enough to say that that guy's gone. And I don't doubt that they didn't tell you that it was gone. They know it's got problems, they just don't know what the extent is.

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The communications people, instrumentations communications people.

Kranze said that transponder number 1, apparently failed completely, and he also said that they're not going to troubleshoot it anymore. That on transponder number 2, that the low power wasn't working yet, hard failure on the low power because they operate in the high power.

DRAUGHON Of what you said there, I'm curious what you interpreted Jean to say. I don't believe that he believes that number 1 has failed completely. I think he does believe that low power number 2 has failed completely. But we the indeed may decide to checkout number 1.

He said number 1 apparently failed, and he also said that you would not troubleshoot it anymore, unless you had further trouble.

DRAUGHON We're not going to troubleshoot it, certainly until we give to the off line guys time to puzzle over what might the potentials be and what's something smarter to do than that one state side pass that I did which was fairly rudimentary. We tried some major straight forward things, and they weren't productive and that's the kind of thing that is not wise to continue to just go in there and keep switching around in the box that you know has a problem. You ought to think about it first.

Right next to you there.

I lost the end of your sentence when you were talking about the weather sometime ago. The weather tomorrow and the next day is adequate but not very good. Is that what I got, gather you said?

DRAUGHON That's correct.

What are the preliminary forecasts like for Monday?

DRAUGHON For Monday, this morning, the last time I talked to the weather folks was around ten. And the weather forecasts for Monday were quite good.

CARLOS Back to this business on the radios. Genes' response about not doing anymore troubleshooting. I had a followup question to that as I recall. Was that they don't want to monkey with that sucker because they might knock it all off.

DRAUGHON You could hurt it and right now it's not doing a lot for you, so it's a question of how much you loose. But you ought to understand what you're. One of Chris' from the Gemini program, one of Chris' old axioms, when we were all learning how to be flight controllers was, if you don't know what you're doing, don't do anything. And that is still a pretty axiom that we sometimes follow.

If it works don't fix it.

JOHN BIZNEY...RKO...Yeah, I wondered if you could just briefly run down the major events in the cap tomorrow for us.

DRAUGHON With some help I can.

Radio guys that need overnight tape.

DRAUGHON There are some NAV base tests in the morning, I believe those are checking out the ability to, for the long pull, in a very preliminary stage we're looking at perhaps using Tacan units as a way of doing on orbit navigation, position determination. We have some of that kind of activity planned in the time line during this flight over various parts of the country, not just U.S. There's some of that in the morning. There are some pulse burns, where we do several short cycle burns with a minimum, but a very specific time delay between the burns trying to get some thermal soak back data on one of the engines. It's one of the small engines, this one this morning was one of the big engines. We finish up tomorrow to nose sun activity, and as you recall, each time we finish up one of these thermal attitudes, we always check the doors to see what that long thermal stress did to the doors, that will be done about midday tomorrow. After that we go directly into the top sun,

which is the last thermal test attitude that we go to. When you first go into top sun there's a set of activities with the SUSIM, which is one of the sun sensors, where we try to very precisely align it pointed at the sun vector. And so we do that about 2 or 3 times prior to the crew going to sleep to make sure that guy is going to get some good data during the crew's sleep period. And that's the major activity for tomorrow.

MIKE TONER...MIAMI HERALD...Given the sequence in which things happen on the transponders. What do you think the possiblities are of the troubleshooting you were doing on number 2 caused the apparent failure of transponder number 1?

I think that's not very likely at all.

Over here on the side by the patch panel.

Do you forsee time in tomorrow's schedule for a transponder 1 test of any kind, and not tomorrow, when?

DRAUGHON I think that if a meaningful test can be developed by the systems people, that are now looking at that thing, there is time in the schedule to conduct the test, and it would probably occur in the latter part of the day.

MORTON DEAN...CBS...Hope you'll excuse my befuddlement here, but is it now stands, you're not sure whether number 1 is kaput.

DRAUGHON That is correct, we know it has problems, we don't know if it's completely failed.

MORTON DEAN...And there may or may not be an attempt tomorrow to bring it back on line if it is kaput, there may be an attempt tomorrow to bring it back on line.

DRAUGHON Yes. Only if you can develop a reasonable scenerio that would support the evidence, the failure evidence that we've seen today. And with that scenario that there's another way to defeat that scenario, that you could get into another configuration that could defeat the failure modes that might have given you the case you have today. If we could build a case like that, then I think we could check that out.

If there are all these various ways of maintaining communication between the ground and the spacecraft, why were the ground rules written, and I know they can be stretched somewhat. Why were they written to say that if you're minus one complete transponder one and a half, it's time to bring the spacecraft home. Why was it important, and it's not important now.

DRAUGHON No, the intent of the communication, or I can tell what the intent of the flight rule is. The intent of the flight rule is to, to not continue to fly past a convenient, if you've

got a convenient place to terminate the mission. You should not fly past there when your in a situation such that one more failure can take away all your communications. The reason for that is that it can determine attitude with IMU alignments and those kinds of things but it doesn't do well in position. So, and that's why we tell the guys how good their state vector is. So, if you loose all your communications capability, you've lost the ability to tell the crew their position. So, that's the real intent, is don't fly, it's poor judgement to fly when you're one failure away from the ability to tell the guys anything.

Aren't you at that point now?

DRAUGHON No you're not, you've got the UHF system, we've got 1 S-band system that works. And as far as getting data down to even help them manage the vehicle, if we loose the PM link we've got, we've got tape recorders which would be just introduce a little delay and that's looking at their systems.

You forsee anything that would bring the ship home Saturday or Sunday.

DRAUGHON There's nothing known. There's no known problem right now that has any potential for doing that. None at all.

JOHN WILFORD... What makes you think that number 1 may not really be failed? Was there something about its behavior when it failed, or something that you've been noticing?

DRAUGHON No.

WILFORD...And by the same token, what makes you sure that number 2 is failed in its mode?

DRAUGHON I talked to the communications guy that was on shift during part of that and he told me that he thought he had done and exhaustive test of system 2, the low power mode. He though it was a conclusive test. At the same time, the same group of people feel that they have not done exhaustive and conclusive tests on number 1. And there was nothing in the failure mode that would make you think that it's really going to be all right. Those indications are not there, it's just that there are a lot of ways to lash that system up, and you need to go check them out before you declare it failed.

You said that the science wasn't complete because we haven't done the top sun. Except for that, if you did have to come home early, would everybody else be satisfied with what they got.

DRAUGHON The other major thing that you would loose is that this flight was also aimed at getting some thermal data in top sun, where we're checking out the vehicle response itself in top sun. There happens to be, I believe, a 40 hour test in the next

flight too. So, it would mean that it's not the end of the world. And if you loose that, we certainly do want to get that 26 or so hours of top sun for the thermal test also.

Yes, but the rest of the OSS-1 pad is that fairly

Yes, I'm speaking for some other people now. But, the quantity of the data that they have been getting and they way they've been talking about it in and around the control center, I think they have gotten a great deal of data.

And one technical question, could you explain very quickly what you mean by a state vector.

DRAUGHON A state vector is a mathematical way of telling, of defining a position and a velocity at a particular time. And it's a way of defining where something is in an orbit. You say it's x, y and z location. It's delta x, y and z velocities and at a particular time. It uniquely defines where you are and which way you're going.

CARLOS BUYERS...If you were betting on the matter. Say something substantial, like a cup of coffee. Which way would you go on the matter of coming in early or coming in late?

DRAUGHON I think we'll land Monday.

BUYERS...Think you'll land Monday.

GEORGE ALEXANDER...Not to beat this in the ground, but just a sequential quenchal questions. Where they using low power number 2, in orbit 55 when it failed? And were they, did they switch over to number 1 transponder in 57, when it failed? In other words, how did you find out that these units had failed?

DRAUGHON I honestly don't know the answer to that. But we don't routinely run in low powers. It's my understanding that we don't routinely operate in a low power mode.

We had that you only use high power to punch through the plasma sheath at ascent.

But it may be right.

DRAUGHON Terry can check on that and get it back to you.

Okay. Isn't it true that you have effectively overwritten the mision rules at this point?

DRAUGHON No, not yet.

You don't know.

DRAUGHON We had a rule, give you an example. We had a rule

in Apollo that you would never, TLI was the translunar injection move. It's a maneuver that took you out of Earth orbit to go to the moon. We had a rule that said, that you would never do that maneuver with the secondary coolant coop failed. We never flew a flight where we checked out the secondary coolant loop before we did TLI. There's some power failures that you could have deduced if the pump was not going to run, that the loops going to run, but you can't draw the conclusion that I'm going to go figure out that there's a hole in that coolant, cause you didn't go look. I mean there are things that if you knew they were wrong you wouldn't operate with. But that doesn't mean you're going to check everything that you can't stand to have go wrong with you.

At the moment you're saying you know that the transponder number 1 is not working, but you don't know why. And therefore, you're not prepared to declare it's not working. Is this so?

DRAUGHON We know it's got a problem, but we don't know what it is.

And that's the problem, that it's not working right?

DRAUGHON We don't know to what extent it's not working.

Were is the gray in this?

DRAUGHON The gray is that I'v still got a system that's working and if it fails

Is that transponder number 1?

DRAUGHON The one that we're runnin on now.

No, that's transponder number 2.

DRAUGHON We now have one that's working, it gives me every bit of capability that I require. If it fails, then I'm forced to go checkout this other guy, and it won't do anything for me.

Is that the guy that's sick.

DRAUGHON Yes, number 1.

So you've got a sick guy, who doesn't work,

DRAUGHON Why don't you let me tell it. We're flying on number 2, and it's doing every single thing, if I had 50 of them, that I could get. It does everything that the vehicle requires. If that one failed, and I went over and then checked out number 1 and got zilch out of it. I can still safely land this vehicle, by using the FM downlink and a tape recorder.

I'm sure you can, but we're just looking at the black and white here, without getting in to the semantics. What you're saying, is that you've got a number 1 is not working, but you don't know why?

DRAUGHON That is true.

Okay, so you're assuming that parts of it work.

DRAUGHON Yes.

And you're operating on the working parts of number 2?

DRAUGHON That's correct.

So, in black and white terms if number 1 is not working, you've already overwritten the rule.

DRAUGHON That's true and if the landing gears are flat, I should have landed yesterday, but I don't know that.

John Getter Channel 11 over here. You got anymore horsebeating?

GETTER Just listening to the air to ground, Jack Lousma said he'd had a wonderful day and suggested that he'd like to stay up for another week there having a good time. Response from capcom was, well check your messages tomorrow morning. How serious consideration is being given to extending the mission beyond its current Monday landing, regardless of the reason? What are the odds it's going to be extended?

DRAUGHON John, I can't put odds on it. The only motivation that I'm aware of towards making the mission longer is the weather at Northrup. We're watching it very closely and the way the patterns develop out there, you go for a period of time when you can't predict what the weather's going to be and then one of those pressure fronts comes across, then you know what it's going to be for about 3 days. And then they stack up again and you just don't know what's going to happen for awhile again until another one pops out. We're managing the consumables to be able to deal with that little quirk of nature that we have no contol over. I have not heard anyone talk about extending it just to bore some more holes in the sky.

Will you extend it simply to avoid making a landing at your current secondary airport?

DRAUGHON If we thought we could get back to Northrup, yes. Yes, we would certainly extend if Northrup were socked in and we thought in a day we could get it back, we would certainly extend, no doubt.

Okay, let's take a couple more and Hal has a short turnaround before he goes on back there, and then one back by the patch panel again.

If you have the rest of number 2 fails, and you have to go back and look at number 1, I want to know how long you think you can fly in that condition, and when will you start really thinking about coming down?

DRAUGHON In that condition, you would immediately start trying to come down to the first acceptable and reasonable opportunity. We could fly for a very long time with the tape recorder operation and FM mode. It's clumsy and it's far different from what we are accustomed to working with, but its very doable.

You would curtail some activity, you wouldn't go around doing test maneuvers and doing engine burns, things that require close coordination and making sure a lot of configuration things are right. But you would take a relaxed entry preparation, make sure you could get it into the entry configuration correctly, get some tape recorded data and you could do it very safely.

Would you be relaxed if you couldn't go into White Sands? And were going to what, to KSC or Edwards concrete?

DRAUGHON It would not complicate that one bit. That's a trajectory aspect, not a systems monitoring issue.

Okay back in the corner there.

You've been talking about coming back early, now possibly coming back late.

DRAUGHON All I talked about was coming back early, you guys were saying coming back late.

Does it have mostly to do with the weather.

DRAUGHON Yes, the only issue that's now a consideration in picking the end of mission time in any discussions that I have been involved in are Northrup weather. There's been no other issue discussed.

Thank you very much.

Okay, off going Flight Director Tommy Holloway has been on the overnight sleep shift and he will now run through his log of the overnight shift. Tommy.

TOMMY HOLLOWAY Well, it's kind of short this morning. We put the crew to bed last night on time. We talked to them about 30 minutes prior to their bedtime and for the last time for the evening. They had an uneventful evening. No alarms, no wakeups that we know of, no reasons that we could see that they were bothered during the evening. They woke up on time. Started off to got off to a good start. Looked like they were up and running and ready to do their work that we have outlined for them today. We did modify the flight plan a little bit last evening to delay some activities and cancel some minor activities to allow Jack and Gordo to do something they had requested to do. They would like to put together 16 mm footage on the normal activities of operating in the spacecraft and they're about doing that probably at this very moment. Basically, it was a pretty slow night last night the way that I hope they stay for the rest of the flight. And with that, I'll entertain any questions.

MARK KRAMER CBS Mr. Holloway. Yesterday when we had the morning briefing, I think everyone in this room walked out with the distinct sensation or feeling or belief impression that everything was well with the transponders with the exception of one downlink and the course of events yesterday leads us to understand that your shift was aware and that you were aware of the failures that had occurred and I'd like you to comment on that and tell us how we all misunderstood what happened.

TOMMY HOLLOWAY Hm, well you know I hate to add to any further confusion that's going on in the COMM world, but let me answer your question as I understand it and I really hope we communicate one with another. Last evening what I told you is I didn't know what the configuration was. I believed we would be able to recover all of the systems except the one that we knew was failed and I had confidence that we would be able to do so, but as the testing went on through the day we found out that we had further failures. Now what has happened to us in the last 36 hours is that we've gone through a shift of three different flight control teams that have been troubleshooting some problems that were in the spacecraft and the status at any one time was in terms of what we thought we had or what we thought we might have and what we knew and what we suspicioned was varying from team to team and that no doubt has added to some confusion, but basically what I intended to say and what I meant to say if I didn't say it was that I thought at that time that we had one failure and that we had a situation that we did not know totally what was going on in some other areas and that the troubleshooting of the day would I had confidence at that point would turn out to show that that was the only failure that we had. So, I left yesterday morning with the same impression you did and when I woke up and my wife

informed me that we had a serious communication problem onboard the orbiter based on what you folks had reported to the public, I was very surprised.

PAUL FRANCH VOICE OF AMERICA Have you definitely allotted some time today to troubleshoot on transponder number 1. There was some question last night.

TOMMY HOLLOWAY No sir. We are not troubleshooting the transponder today.

PIERS ACKERMAN LONDON TIMES If you're not troubleshooting number one and it's I presume it's still not working, could you outline which of the communication systems aboard are currently working and who's decision was it to override the mission rules.

TOMMY HOLLOWAY Mr. Kranz talked to you in detail about where he thought the flight operations were was that yesterday and I'll refer you back to those discussions and I think there's a transcript of his press conference, but as far as we're at right now we're operating on transponder number 2 in the high power mode and it's working fine.

JOHN PINE What's the latest you've got on the weather situation out in White Sands. Anything new since last night?

TOMMY HOLLOWAY I received a briefing on the weather last evening and at probably about 2:00 am. At that time, the weather appeared to be marginal today for a landing at Northrup Strip with the predictions being for good weather on Sunday, that's tomorrow, and the reason I'm going slow is I lose track of days. So tomorrow the weather is predicted to be good a Northrup Strip and deteriorating sometime Monday afternoon for a front coming through that will pass through and if it's typical probably clear out by Tuesday. So, right now it looks like we have quite a few options in terms of selecting a landing site landing time.

WAYNE DOLCEFINO KTRH If the weather is going to deteriorate Monday afternoon does tomorrow look like in your opinion a better time to do it.

TOMMY HOLLOWAY Well, if that was the only consideration is picking the best time to do it tomorrow would be the best time, based on information I had some four or five hours ago.

PIERS ACKERMAN LONDON TIMES If what other considerations do you have at the moment then.

TOMMY HOLLOWAY Well, you know, we have the consideration of wanting to complete the flight and having the basic desire to complete the flight and accomplish the activities that we have

scheduled for the seven days we'd the management will decide today probably this morning and if they'll deorbit tomorrow or wait until Monday. And, frankly I'm not participating in those processes. They decide to deorbit, I'll put the mechanism in place this evening to bring it about tomorrow.

MARK KRAMER Two part question. Let me go back to the transponders again because I'm really very interested in this. The failures occurred I think if I recall on orbits 55 and 57.

TOMMY HOLLOWAY We had some difficulties on those orbits and it's hypothesized when the failures occurred, but I'm not sure exactly when the failures occurred but we had problems communicating on those revs. ..

MARK KRAMER But, was your shift unable to determine that at all. I mean...

TOMMY HOLLOWAY My shift did not know what the status of the communications was when I talked to you nor on rev 57. We established an acceptable communications mode through transponder number 2 in the high power mode, slept that way all night and we came in this time a little later than this time, we came in yesterday and told you that we had one failure and we thought we'd be able to recover the rest of the system that was suspect.

MARK KRAMER Okay, the final question goes back to weather. Do you have specifics on weather forecasts for Sunday Monday and Tuesday. Visibility.

TOMMY HOLLOWAY No I don't, I sure don't. I didn't bring that with me and I can't recall it from memory.

PAUL RECER ASSOCIATED PRESS You said management may meet this morning to determine whether or not they're going to land tomorrow or Monday. Are they also considering the options of extending the flight beyond Monday?

TOMMY HOLLOWAY Well, no sir. I don't think they are considering that as an option at this point. Obviously as we consider the weather as we approach Monday itself, we could elect to extend if we thought Tuesday was a much better day than Monday once having approached Monday. What I'm trying to say is that we're not anticipating extending today deciding to extend today for the sake of extending and making the space shuttle three a day longer. But, as we approach the actual deorbit, if at the planned end of mission if we determine at that point that in our judgement it would be better to extend a day for the purpose of achieving a better situation weather situation we have that option and it might come to pass.

PAUL RECER Okay, if in the event they decide to land tomorrow, you know when during the day approximately the best opportunity would be?

TOMMY HOLLOWAY Well as an operator I'd like to know around noon today so that we could put some mechanisms in place to get prepared this afternoon, get some preliminary stowage and work done this afternoon and our management understands that requirement and I hope they follow our desire to make the decision by that time.

PAUL RECER Okay, well I'll go at it another way. What is the best deorbit opportunity or when is the best deorbit opportunity tomorrow.

PAO Rev 101 isn't it.

TOMMY HOLLOWAY I have that someplace. It's 24 hours early than, approximately 24 hours earlier than rev 115 at the end of mission.

PAO Be 16 revs, be 99.

PAUL RECER And one other further thing, do you have any plans to deorbit earlier than 1:15 on Monday in the event Monday is selected in view of the deteriorating weather for the afternoon. Do you have an opportunity earlier than that.

TOMMY HOLLOWAY We have multiple opportunities each day to deorbit as you already know and if the weather situation is deteriorating and we believe that coming home one rev early can solve that problem, we can certainly do that. Now, at this stage of the game some two days ahead of the planned landing opportunity by you would not entertain such a suggestion. You'd wait till you get much closer before you think about those kinds of activities. Those kind of decisions.

PAUL RECER Okay, and one final question. I do understand that the management is meeting today on this and discussing the landing times and days and therefore some conclusion should be drawn by when, this afternoon?

TOMMY HOLLOWAY Yes sir I would think so.

PINE REUTERS The impression I get now is that Northrup is it no matter what. And Johnson and Kennedy, the concrete runways would only be really a last resort. Not Johnson, I mean Kennedy and Edwards concrete runways. Is that your impression as well.

TOMMY HOLLOWAY Well certainly we've always wanted to land at either Northrup or Edwards back when we had the lake bed. Now only having the Northrup Strip with a long runway we certainly

would want to land at Northrup Strip as long as it's a reasonable thing to do considering the weather conditions at Northrup Strip. On the other hand, if the situation comes to pass that Northrup Strip is unacceptable from the weather point of view, we certainly have the capability to land at either KSC or Edwards on the concrete and when the time comes to make that decision we can do that.

PINE There's no priority on which of those two is number 2. They're both equal.

TOMMY HOLLOWAY I think in most people's judgement, the minds that would be involved in that sort of a decision, that's absolutely correct. There are considerations on both counts and based on the situation at the time and the weather at each site and so on and so forth, it could go either way should we not be able to deorbit at Northrup Strip.

RON OGGLE ABC In terms of the lake bed itself is Edwards a viable option on the dirt.

TOMMY HOLLOWAY No sir I don't think so. The last report I had the lake bed was 4 to 6 weeks away from being suitable to land an orbiter on it.

MARK KRAMER If you decided to come back at a given time, let's say the planned end of mission time which I think is about 2:27 Eastern Time, 1:27 here, what's the latest point at which you could a chop a revolution off that. Could you do that as early or as late as 6 hours prior to that time, or would you have to make such a decision 12 hours prior to that time or when.

TOMMY HOLLOWAY We'd certainly prepare, prefer to make a decision 12 hours ahead of time but, we could make a decision to come home a orbit late in the order of say 6 hours ahead of deal.

MARK KRAMER Would you say that's the deadline.

TOMMY HOLLOWAY Unless it was an emergency situation, that's about correct.

MARK KRAMER So, let me understand something, I think you said that you would want to know that is, the flight controllers would like to know 24 hours before landing that you're going to land and the crew would start making preparations approximately 12 hours before, that is before they went to bed and the cutoff for change of 1 rev would be say 6 hours prior to it.

TOMMY HOLLOWAY Yes.

WAYNE DOLCEFINO KTRH Tommy, can you explain this last thermal maneuver we're going to be doing this afternoon, top to sun

basically what that's intended to do. Just in general terms.

TOMMY HOLLOWAY Well the top sun we're going to spend the day top to sun, we're going to go top sun this afternoon and be there all night tonight and all day tomorrow. There are really probably 3 basic reasons we want to go top sun. First of all to see the transition thermal transition between the nose sun thermal condition after having approximately 80 hours in that attitude, and watch the orbiter react to having gone from one extreme to the other. The second reason is that we want to warm the top of the vehicle and close the payload bay doors tomorrow afternoon and see what the deflections are in the hot part as far as the doors are concerned in the hot case. We've already had some experience in the cold case on a previous attempt after of closing the doors after the tail sun exercise. The third reason is that there is experiments onboard that like to look at the sun and they'll get their opportunity to operate this evening and tomorrow.

PIERS ACKERMAN LONDON TIMES Could you tell us what the modifications to todays schedule will be. Briefly run through todays operation. Thank you.

TOMMY HOLLOWAY Okay the modifications in terms of general things are very small. The plan is basically to do what was scheduled. We did make some delay some activities this morning to give Jack and Gordo another hour to do their 16 mm photography production that I spoke of earlier. But, today basically we're doing some additional some more propulsion testing. We're going to fire some the little vernier thruster at two different times after having let it operate for a period of time without any firing and see how it reacts and how it soaks back. That's about 4 hours from now. The first one, the second one is about 6 hours from now. Also, we've reinstated this afternoon in a period of time that was very relaxed from the standpoint of crew schedule, we've reinstated a cold OMS engine restart burn that was not performed yesterday. In addition to that we are currently planning to close the payload bay doors around noon and determine how they operate and what the thermal deflections of the doors are after having spent this 80 hours in top sun. I might add that we're debating on whether we really want to close those doors or not and it might it's possible that we'll cancel those that door closing before it occurs.

MARK KRAMER I think Hal Draughon last night mentioned a flight control system check to be performed at some undetermined time or unmentioned time which would involve a checkout of APU 3. Can you talk a little bit about that. Does that call for firing up the APU and then shutting it down in space.

TOMMY HOLLOWAY In a planned in the preflight plan, we had planned to do what we call a flight control system checkout about

5 hours prior to deorbit in which an APU is fired up if to use your term, and used to cycle elevons and put a load on the system to see if we have some failures that we want to checkout prior to deorbit and in the aerosurface amplifiers. That has been in place and in fact has been done on all of the orbiter flights to date. The change that Harold talked to you about is to allow that APU that we use to power the hydraulics for that test to run a few minutes longer like 8 to 10 minutes, instead of 4 to 5 minutes and allow it to heat up like it did in ascent, and at about 6 or 8 minutes, it would be expected to get up to the 250 to 260 degrees at which time it requires cooling and the water spray boiler if it's working correctly will come on cool the APU and the temperature will stay at 250 degrees. If it doesn't cool, we'll switch to the backup controller on that water spray boiler to see if the backup controller works and if it doesn't work we will then know that the APU water spray boiler has failed and would overheat if we powered it up early in entry. And Harold at that time would exercise an option to delay powering that APU until close to landing just prior to TAME and at that time these APUs will run about 6 or 8 minutes without any cooling as we demonstrated during launch. We shut it down at about 7 3/4 minutes or maybe 8 minutes to ascent. So, that's basically what he was talking to you about and we expect to do that in the afternoon of Sunday afternoon, flight day 7.

PAO Okay thank you very much.

END OF TAPE

TOM HOLLOWAY Good afternoon. Welcome to the change of shift briefing with flight director Harold Draughon. Let Harold begin with a statement about his shift and then we'll invite questions. Harold.

HAROLD DRAUGHON Okay, our shift today was as normal as the one yesterday. A brief summary of events early this morning. The first major objective was a test bearing on one of the vernier RCS engines that was a what's called L5D, it was a left vernier manifold 5 downfiring jet and it involved a series of pulses of that engine in this particular cold attitude. We have to keep that jet and the surrounding structure cool. We are now operating in a configuration that uses the right hand OMS pod jets and the nose jets and for attitude control we're firing nose jets even to give any thermal soak back or thermal heat into that region, trying to keep it real cold. That we have executed it correctly and we'll have to wait until after the flight to learn what we will about how the adequacy of the models of this thermal group have in predicting those kind of temperatures, which is really the intent of the test. There have been a variety of science objectives, the normal timeline to if you've got copies of the CAPs we have been doing just exactly what was planned there so I think there was some VCAP visual beam search which was the electron emitter firing up above the bay and this particular one yesterday I discussed with you taking the PDP with the RMS and trying to ascertain where the beam was. Today, the objective was to, in addition to creating a charge on the vehicle, the other objective was to have the crew look out and see if they could actually see the beam the electrons as they stream out. They could not on one particular pass they even turned out the lights in the cabin to help them the best they could and they couldn't they never reported any sightings. And one of the tests that was done preflight in one of the vacuum chambers they had that particular instrument operating and they could see a glow from the experiment. Obviously, the difference is between the chamber pressure and a perfect vacuum. We've done several EEVT samples under those the last one was blood cells, the last one before I came off shift. The crew volunteered an extra TV pass about mid morning and they put up the bees again and we got another good show of that. In general, there seemed to be a little less activity until you stimulated them and there was the first time they put them up. I think Jack commented that more of them tend to stay around the sides of the container now and just if there is any adaptation going on they've just learned to quit trying to fight the conditions. It was a very interesting show and then they gave us another scheduled TV pass at that showed them at work in the forward crew station. The IECM has been operating today and that operation has gone very normal. That took it up to the handover, right now Neil's has the orbit team on and they are we're just finishing up that nose sun thermal test that we've been in roughly 80 hours. At the end of it as all the other thermal attitude test attitudes they're

right now fixing to try cycling the payload bay doors. At the end of the door cycle there is a rescheduling of the OMS burn that we had yesterday afternoon. We've that particular burn is a cold engine cold engine test and we wanted to get the engine very cold, burn it for a short period of time, very short duration burn, wait a few minutes, I think it was 2 minutes, and do another burn. We didn't have the thing as cold as we wanted to get it yesterday. The thermal environment was just a little more benign than we had anticipated and we were hoping to get it colder. It looked like the thing has reached equilibrium and we weren't going to get it any colder so we went ahead and put it back in this morning, scheduled it back into the timeline. So that is scheduled to occur in a couple hours. After the test burn there are some one of the solar experiments, the SUSIM, is scheduled to get some alignments and they'll be doing that just prior to going into the sleep period. Some interesting things from the shift, the PDP has a mass spectrometer on it, actually could detect the pressure change when we did one of the scheduled water dumps today which was interesting. The I've already mentioned we didn't have any luck with the crew looking for the VCAP visual beam. We had the crew reported during their last meal period, I think you've all seen these little accordian looking beverage containers where they've got dried powder and they just add water to them and it blows them up, shake them up, and you've got some cherry coolade or grape coolade or whatever you like. They've had three of those guys fail they told us. After the third one failed we didn't know they never mentioned the first two but it's a little mess of a cleanup job. We'll be looking at some way to improve the stiffness. They said all three of them had failed in the same area, that's up near the neck but they didn't go into any details. And we didn't offer them any help in suggested ways to clean the stuff up. If they coped with that problem twice before I'm sure they'd figured out a way to cope with it. The SUSIM experiment which will be activated which will be aligned just prior to sleep period tonight has had a malfunction in it. It's designed to look at several at a frequency band at a wavelength band when viewing the sun. The unit that causes the gradient to sweep through the various wavelengths is not functioning at the present time and therefore, it's stuck looking at one particular wavelength and I don't remember which I don't remember the frequency it's looking at. So those folks will be trying to determine if there's any troubleshooting we can do of that. There's not a great deal that I'm aware of that you can do with that particular instrument but those folks will be dealing with that and deciding what else they can do with that particular instrument. The weather at Northrup is good for Monday. At the present time we have every intention of having the end of mission this coming Monday at the nominal rev. The weather out there as of an hour ago was the forecast was 25,000 feet scattered, another layer at 12,000 foot and scattered, visibility is 7 plus which is they don't define how good it is beyond, that just means you get good visibility, and the gusts are quite low in the morning and go to about 18 knots up to 18 knots in the afternoon. That varies

daily. The touchdown times central standard it's 1:27, at Northrup it'll be one hour different 12:27, if you'd like to deal with MET it's 7 days 3 hours 27 minutes and 14 seconds. And if you'd like it in GMT it's day 88 19 27 14. And with that I'll take any questions.

TOM HOLLOWAY Is that is there an OMS burn figured in that landing time. We decided

HAROLD DRAUGHON That particular OMS burn is it is but it doesn't affect that. The attitude for that OMS burn is going to be directed out of plane. So it won't affect the ephemeris.

TOM HOLLOWAY Yes sir, Wayne Dulsopheno, in the back seat there please.

WAYNE DULSOPHENO Any change in the transponder situation and also it sounded like one of the guys has lost a transmitter. I think it went from B to C transmitter. Is that any big deal, or is there a backup?

HAROLD DRAUGHON No there are I believe there are three. There are you know that we built a new wireless headsets and that's what broke. There's an A, B and a C. And the one that Jack was wearing malfunctioned and he took it off and the problem he had with it was it wouldn't transmit. He was still receiving. So he just went and put the spare on. There's been no change in the S-band situation.

TOM HOLLOWAY Mark Cramer, please. And if I neglect to call on you by name, please give me your name and affiliation.

MARK CRAMER CBS Regarding the landing. I understand that there's a forecast for winds aloft substantial speeds of 100 knots and from a westerly direction. Do you know has anyone given any thought whether or not the approach will be done with a right hand turn or left hand turn into 17.

HAROLD DRAUGHON We've given quite a bit of thought to that. The general rule that we've worked out with Jack in simulations prior to flight were the place that's most interesting is between 20,000 feet and about 50,000 feet and if the trailing wind if you have a tail wind coming into the HAC, the place that you actually get onto the HAC circle, if that's bigger than roughly 70 or 80 knots, and the runway you're going to has a turn angle on that circle bigger than 270 degrees then in trying to make that approach a left hand turn approach then we'll reverse it and take the short way around the hack and go to a right hand turn. The reason is that on a long turn angle if you're, alright I'm going to have to use my hands guys sorry about that, if you've got if you're trying to come into a circle here and land on the runway then you come in and counter it, fly around down here. If you've got a large headwind tail end coming in this way, if you turn it tends to blow you off the circle and then you get way

out. If you get too far out you can't come back. You can come back but you never get all the way back.

MARK CRAMER CBS I guess I didn't understand the answer. Is it a left hand turn or a right hand turn?

HAROLD DRAUGHON It depends on the winds.

MARK CRAMER CBS Well, if the winds are as they are today you have he's flying essentially due east, is he not? So he would have a 270 degree turn to make.

HAROLD DRAUGHON He's flying due east but again we prefer to make a left hand turn so the commander has the best view out his window. If there're tail winds in that altitude band I quoted you are not excessive we will do that. We'll make a left hand turn. If those commonly called jet stream winds are higher up above say 80 knots and we're going to a runway that you have to fly a long ways around the hack to get to and that's a function of the surface when it's another whole discussion. If you go into a runway where you have to fly a long ways around the hack then you go right hand turn if you've got excessive tail winds. It's I can try to make it clear for you.

TOM HOLLOWAY John Wilford

JOHN WILFORD Have the crew been informed of the Monday decision? Do you still hold an option for Tuesday landing? And were there any other considerations besides the weather when you were looking into the idea of landing on Sunday?

HAROLD DRAUGHON The crew has only been we've given item passing comment the weather looks good for Monday and I'm sure they've encurred for that. That's when we intend to have the end of mission. We have given them no word to indicate that we were looking at a shorter or a longer mission. So there's no need to tell them we've reanchored on Monday because we really as far as they're concerned we've never left there. Sunday, the weather forecast if anything is slightly better than is Monday, but Monday is a perfect fix up and we plan to get to the nominal end of mission.

JOHN WILFORD My point was, is there anything else in your consideration for an early landing?

HAROLD DRAUGHON No.

JOHN WILFORD No problems with the spacecraft?

HAROLD DRAUGHON If there were then we'd come down Sunday because the weather is indeed better.

TOM HOLLOWAY Yes sir, your name is?

JOHN VAN CHICAGO TRIBUNE John Van with the Chicago Tribune. In e course of making your landing on Monday, how flexible are you with relationship to the winds and the idea that you'd like to get a crosswind landing? Might you come in a bit earlier if it looked like you could get a decent crosswind? Do you have that capability? What is the what are the parameters in this?

HAROLD DRAUGHON We have the ability to come in on several revs. The way the winds behave at Northrup, what they tend to do is between 10 and 12:30 they tend to grow and in the morning they tend to very calm and in the afternoon they tend to get a little higher than what we'd prefer to land with. In the morning they're on the order of 5 to 7 knots. After 1 or 2, well after 2 o'clock or so they on a mean wind is 22, 24 knots and sometimes higher than that. We can the landing opportunities that we have we've got three good revs that are in that general time frame. The one that we're anchored on which is the same rev that we would have come in on to Edwards is almost an equal split and it would we obviously didn't plan it that way statistics just came out that way once we left Edwards and went to Northrup. You have a low probability of having a very benign wind which would be early a.m. We have also have a fairly low probability of having one of these excessive 20, 25 mile knot winds in the afternoon landing at about 12:30 which is. So we have a fair possibility of getting what we would most like to get which is a crosswind landing. We'd like to get a crosswind landing with a magnitude between 10 and 15 knots. If it's less than that then we don't it's significantly less than about a 10 knot crosswind we don't think it's a very good test. If it's much bigger than 15 knots then we'd rather not do that the first time out. So we think we're at the right place on the right road.

JOHN VAN But what I was getting at, on Monday morning when you can actually see what the wind is doing would you be flexible enought to say we'd like you to come in a rev early or a rev late if indeed it looked like you'd get the optimal condition then?

HAROLD DRAUGHON On Monday morning the winds are going to be 5 knots like they are every morning. And I won't know a couple of hours before entry as far as late changes the latest and you can comfortably do it. You can comfortably change your landing rev easily with almost no sweat down to 6 hours before entry. It's almost no impact to do that.

TOM HOLLOWAY (garble) Marcia, we'll get way in the back there next, way back.

WALTER BAGGERS ROITERS Walter Baggers from Roiters. Can you give us some MET time frame for D orbit and entry and blackout and things like that? Because we don't have the timeline now that is accurate.

HAROLD DRAUGHON I wish I brought one with me. I believe it's 30 minutes between deorbit and it's 30 minutes and 1/2 between entry

interface which is 200,000 feet and touchdown. And it's 29.4 (nutes between deorbit ignition and entry interface and if you add those two together you get within a 1/2 minute of an hour.

TOM HOLLOWAY Yes sir. Would you wait for the mike please?

about the question about the

TOM HOLLOWAY Pardon me for interrupting again, but thank you.

Question that broods here is when you speak of a cross wind, do you mean quartering crosswind or 90 degrees right over the wind over the wing, define crosswind for us, what.

HAROLD DRAUGHON The criteria that I stated which is greater than 10 but not greater than 15 is a perpendicular component. We access it by resolving it to a perpendicular component and if it's 90, it's a 90 degree component in that magnitude.

TOM HOLLOWAY Carlos Byers

CARLOS BYERS We go back and plow a little of the old ground for a moment. Couple of questions. One, have you done anymore testing, troubleshooting, what have you with the communications systems. Secondly, have the crew done anything or anything as far as the space potty is concerned.

HAROLD DRAUGHON The answer is no to both questions. We have done no troubleshooting on the S-band system and don't plan to unless we have a problem with the one we're on and they have done nothing to my knowledge to the waste control system.

TOM HOLLOWAY George Alexander. Marcia, would you find Dave Dooley and we'll get him next.

GEORGE ALEXANDER You said something about the IECM. It was turned on. You can operate that package without removing it from the

HAROLD DRAUGHON Oh yes, yes it has other modes where it's looking for contamination right there in the bay and they have had it operating in that manner.

GEORGE ALEXANDER The arm is cradled and it's going to remain that way?

HAROLD DRAUGHON Yes.

GEORGE ALEXANDER And the final thing, is I just didn't hear you say, the PDP MASS SPEC did detect change in something during water dump. I just didn't hear what you had said.

HAROLD DRAUGHON You can correlate and I'm talking about a scientist's data here, I believe you can collate the number of

detections that they're getting on ionized particles to pressure. So by virture of the count they're seeing on that instrument you can deduce what the pressure must be.

Dave Dooley, then after this question we'll go to Kennedy.

DAVE DOOLEY HUNTSVILLE TIMES What is the situation on consumables right now and I arrived a little bit late I believe when I came in here saying they had finished up the test runs on the EEVT

HAROLD DRAUGHON They haven't finished them. There is one more scheduled for this afternoon that I know of. I don't know if there are any scheduled for tomorrow or not. I know there's one more this afternoon. Consumables, we have roughly nominal into mission plus three days capability left. I expect it's not been decided yet, but I would expect that some of the systems like an extra GPC and some of the heaters might be turned on tonight in preparation for the sleep period just because we've got a good enough handle on the weather now that we don't need as or don't wish to keep this big option on extending the mission should the weather force us into it.

KENNEDY

DICK LEWIS Chicago Sun Times I have two short questions. If it's decided to take advantage of the lighter morning winds, what rev would you come in on.

HAROLD DRAUGHON We would not, I don't think it is reasonable to assume that we would entertain coming in any earlier than one rev early.

DICK LEWIS The flight is extended about close to a thousand miles coming into White Sands. Is there any difficulty coming over the mountains as this vehicle descends. Air drafts, unsettled atmosphere and so on and do you fly over any cities.

HAROLD DRAUGHON They do fly close to a couple of cities at high mach numbers if you're thinking about the breaking the sound barrier, but we're at a high enough altitude we have looked at all those kind of things and we're at a high enough altitude that we don't think there is any concern; as far as the weather in those vicinity of the mountains that the weather is there that's where thunderstorms tend to stack up but again for the same reason we are so high when we come across that mountain ridge to the northwest that it's all well below you and not an issue.

There was a ground track that we had availble at Kennedy I know I pasted it on the wall myself a week ago and it's probably still around there somewhere. I'll show you where...

DICK LEWIS The only trouble is you can't read it.

HARRY ROSENTHAL Associated Press We missed the first 10 minutes or so of this briefing and you may have covered this before, you had a very ambitious schedule of experiments and tasks for the spacecraft, can you sum up just how much of it you've accomplished. How successful you were at it.

HAROLD DRAUGHON I think it's been it's really has been extremely successful. It would be hard for us to put a percentage basis on it. There was a test or so that didn't get done on the early RMS checkout. We went back yesterday and picked up one of those on my shift which was cradling the RMS in the backup mode. That went 100 percent. I'm not sure, just because I didn't pull that shift, how much of the loaded arm and RCS system got accomplished. I know that they got a significant amount of it. Whether or not they got it all I just don't know. As far as the science is concerned, I know that the folks that are not the top sun oriented scientists have gotten all or more than they ever hoped for. And it's too early to speak for the other guys. We do know that the SUSIM is going to have some reduction because it's got this failure and without talking to him directly, I couldn't quantify that for you.

HARRY ROSENTHAL And another question, should you decide to come home an orbit early, can you describe to us in layman's terms how you do that.

HAROLD DRAUGHON Yes, you do it just like the other just like you do for the nominal rev. You just start hour and a half early. The burn will occur a little more to the west of Yarragadee, Australia, the only thing that you lose out of that is we have a pass a station acquisition after the deorbit maneuver over Guam on a nominal rev. You come in a rev early the ground track happens to not fly over Guam so you would lose that. That is not a mandatory requirement. It's nice to have it's a nice to have feature that you can check the vehicles configuration and give the crew an extra helping hand there just before entry. It's nice to have. If I needed to come in a rev early because of the winds were building too quickly at Northrup and I would certainly exercise that option.

JOHNSON

MARK KRAMER On that same subject I want to make sure I understand this. At landing -6 hours you could say let's come in one rev early and the crew has enough spare time to lose that 90 minutes.

TOMMY HOLLOWAY Yes. If you know it, if you see it coming and know it ahead of time, we would probably get the crew up a half hour 45 minutes early, but we normally consider deorbit preparation to begin at about deorbit -6 hours TIG -6 hours. Ignition -6 hours. And there is time in there, we have practiced that, we get into simulations where they'll routinely do things

give you leaking propellant tanks and things where you just can't stay on orbit and you try to accelerate your preparation and we can handle that part readily.

JAMES WILKINSON BBC Can you describe very briefly again those times you gave for deorbit burn and interface and so on.

TOMMY HOLLOWAY Okay. The touchdown time is Central Standard Time for that is 1:27 at Northrup that's an hour earlier 12:27. The time that your into sensible atmosphere which is something ya'll hear us talk about quite a bit entry interface, is roughly 30 minutes. Before that the deorbit ignition itself the burn is another 30 minutes in front of that. And there is a half a minute error on both of those margins. So it's an hour between TIG and landing.

JAMES WILKINSON And the communications blackout is when. At interface or?

TOMMY HOLLOWAY It's a few mach numbers below that. It's you'll lose commu...actually you lose communication because you lose Guam and then entry interface is just past there. Then you go into black out and at around mach 26 or so and come back out around mach 16.

JOHN VAN Chicago Tribune Just one other thing that we've heard about the last few days. What about the leak with the itrogen is that still leaking, what's the status.

TOMMY HOLLOWAY No, we found that rascal finally. It's in PCS system pressurization system number 2 and we can we have a way of connecting either the system 1 tanks or system 2 tanks to the other pressurization system and we can completely isolate that leg and not have to feed that leak. The magnitude of the leak, we were to have a failure in the other system now like a regulator or something, the magnitude of that leak is one that in general could feed could afford to feed if we had to. But, we will no' go back to that system unless we need to.

PETER ADAMS Is the plan still for a Gordo to land 200 feet. Is there any change in the way the astronauts will be coming in due to the S band problems or anything.

TOMMY HOLLOWAY No there's no correlation at all.

TONY MELASKI CBC Two questions, firstly on the TV pass of the meal time routine, do you happen to know what they were eating and secondly we've heard only general comments saying that the RMS tests were fine. Could you characterize the performance of the RMS to date in this mission.

TOMMY HOLLOWAY The RMS performance was spectacular. The crew s very jubilant over it and as were we. That TV pass we had day before yesterday when they had one of the forward bulkhead

cameras on the arm as it went through one of it's auto maneuvers it was just as smooth as it could be. The unberthing and reberthing of the payloads without the aide of the wrist camera which you normally have that just went just as well as you could hope for. The arm has performed beautifully. Everybody is awfully happy with it.

...meal time.

TOMMY HOLLOWAY I honestly don't know what they were eating. I think breakfast this morning and the only thing I recognize was Jack Lousma had a container of what I think was orange juice, one of those squeeze, no I'm sorry grape juice.

Is it a nauseating looking plastic pouch with purple ....

TOMMY HOLLOWAY Yes that's it. Well wait a minute I don't know if we're going to confirm it was nauseating, but it....confirm the other part of that.

CARLOS BYARS You know when you get ready to bring the crew back in, who can you make the decision without further referral if you feel the winds are picking up and you want to come a rev early.

TOMMY HOLLOWAY Well I won't be put in a situation. Yes I could. But, when you get that close to entry, all of your management friends are close by.

TOMMY HOLLOWAY You have all of the help you can stand.

Anything further here in Houston. Okay thank you very much. We appreciate your attention and your time.

END OF TAPE

Good evening. They told us there was going to be sparse attendence but it doesn't look too sparse. We've got Flight Director Neil Hutchinson and Dr. Sam Pool, Chief of Medical Sciences Divison here at JSC. We'll start with a summary of the Silver Team shift today.

HUTCHINSON Good evening. This is...not hearing mike? How now?

Fine up here.

HUTCHINSON I'm getting good feedback in my ear here. You okay? We had a very, very quiet shift today, on my shift, in the Control Center. Much quieter than, and particularly at the end, than the last time I was here which was a couple of days ago. We got everything done today that we had planned on getting done. A hundred percent of everything. We are now in the top sun thermal attitude and will be there until we get ready to equalize the temperatures prior to entry, which is late tomorrow afternoon. Today we did the next to the last of the EEVT samples. Did our cold OMS restart, not quite so cold, but did it, did the cold OMS restart. Started some cryothermal tests and we are operating, since we are in top sun, the experiments, sun looking experiments, the x-ray polarimeter and the SUSIM, the solar ultraviolet system. Tomorrow is going to be pretty much as it is in your published flight plans. We are going to start APU 3 tomorrow, in the morning, during the FCS checkout and we have a procedure already onboard to run it a little extra length of time to verify both controller A and controller B on the water spray boiler on that APU. Right now that's the only extraordinary thing that's anything different than what you have in your hands printed for tomorrow's activities. We're still planning on coming home on Monday. The weather's looking reasonable, and with that...Sam may want us to make a general statement, although my impression is the crew is just superb. If you listened tonight to any air/ground, you probably heard the thump, thump, thump of the Thornton treadmill. Both of them were using the treadmill tonight after dinner. Well, I guess Jack before dinner and Gordon after, and seemed to be enjoying it, learning how to use it in 0-g.

DR. POOL During our discussions with them this evening, I think we determined, and they said they were in top shape physically and mentally. They've been eating well, sleeping well, and apparently enjoyed their exercise session.

Okay. We're ready for questions. Back there Aurthor.

WAYNE DULSOPHENO...KTRH...Does the S-band system play any special role in the reentry part of this thing from the orbit burn down, and if not can you just explain what role it does play.

HUTCHINSON No different than the role it plays while on orbit, and that is getting data to us and getting data to the recorder as well. The transmitting part of the S-band system, of course, is getting data to us, and as you're aware, we get a pass after retrofire, after the deorbit burn over Guam, a couple or three minutes worth of data, and then the vehicle goes LOS and then shortly after that, it goes into blackout and is unavailble for radio communications till around 180,000 feet and from that point all the way to the runway, we have telemetry data and radar data and voice data through that system.

DULSOPHENO...I'm talking real if's here, and excuse that, but what would happen if, lets say, during the period of blackout if we lost the other high power side of the S-band. Would it present a problem once you came out of that blackout period?

HUTCHINSON No.

DOLSOPHENO...Okay.

HUTCHINSON And remember, we have UHF for air/ground comm along with that.

DAVE DOOLING...HUNTSVILLE TIMES...How much, I presume, warmer than expected was the OMS thruster and am I correct in my impression that it seems that all around on the thermal tests that things have been more benign than you had been projecting?

HUTCHINSON About 10 degrees on the OMS question and yes. Things are not cooling off as fast and as far as we had expected. The vehicle seems to be considerably more benign thermally than we had expected.

DAVE DOOLING...Okay. Is that a good sign for future planning?

HUTCHINSON Oh yes. Yes. The reason it's a good sign is because, not that we hit any thermal stresses in the vehicle, but primarily, it allows us to operate at lower power levels, which means that for a given amount of cryogenics, all these systems have heaters on them and in particular, the hydraulic system is the one that we've been concerned about, and you know, we have some pumps that run and they take a lot of power. I'm talking about the circ pumps that run, one on each system, and cycle based on the temperatures being observed in the system and their duty cycles are a lot less than we expected in these attitudes and, of course, that in plain English, means you can fly longer in a colder attitude with a given amount of cryogens onboard because you don't have to spend the power for the heaters and the pumps, and things like that.

We'll get you next Paul.

JOHN GETTER...KHOU...How concerned are you about conditions at

White Sands for landing. At what point do you have to make a decision on whether you go to White Sands or go to Florida. Missing from the prognostications we're being given today are the visibility guesses for the landing period.

HUTCHINSON Well John, I really hate to speculate on the weather situation. You ask a lot of different questions there. The weather situation, of course, the closer in we get, the more accurate we get on what is actually going to happen. We are making a flight in the shuttle training aircraft with John Young at the controls about the time the crew wakes up on entry morning and, of course, another one on the way in and if there is any question on the visibility circumstances, or the wind circumstances, those are going to be answered by the shuttle training aircraft flight, as well as, of course, the prognostication on the part of the weather people. Let me say something about the second part of your question. I don't really think we've made any kind of a decision on any kind of a backup runway. We have, obviously, the hard surface at the Cape and we have the hard surface at Edwards and I have personally not heard any conversation exhibiting a preference of one over the other. There may be but I haven't heard any, and our preference is to get down in the desert and we're going to try real hard to do that. Our visibility requirements, again, let me say although we have some, and I'm not sure I can remember them, but they're basically, if there is any question on the visibility in terms of the crew being able to see the runway or see the aim point, or see the landmarks or anything, it will be determined by an actual flight by the shuttle training aircraft just like we've done previously at both the Cape for RTLS and at the end of mission site.

Paul Reiser right here, and then we'll get Jules over here.

PAUL REISER...Could you give us a kind of a summary characteristic or assessment of the success or failure or accomplishment of this mission?

HUTCHINSON Well, I think, quite frankly, I'm sure it appears with our little problem with the S-band comm and the television cameras and everything, that we've had a bunch of things nipping at our heels it seems all the way along, but if you put it into context of the fact that we appear to be going to go our full duration here, we better than doubled the total amount of time in space that we have on this vehicle, we have gotten some outstanding performance out of the systems working against one of the tougher tests we had in the program, which, other than just getting up and getting down, which were these long thermal cold and heat soaks. The arm has performed impeccably. We got another really big first by picking up and putting down a payload several times and doing that without the aid of all the devices that we would have liked to have had at our disposal. I think the thing has just been a tremendous success. The tiles, they

have to bug you a little bit, I think, of course, we didn't liftoff thinking we were going to lose any tiles and we haven't lost any that are going to bother us getting back, but that is going to have to be something that will need to be re-examined when we get back to make sure that we understand why and how and that it doesn't happen again. But in general, you've got to really be pleased with the performance of the vehicle and the people and the whole system.

Jules Bergman.

JULES BERGMAN...ABC NEWS...Neil, CAPCOM on the line this afternoon characterized the mission as a 100% success and Fullerton then came back and said, I couldn't quite hear it, would you make that a 101%, or words to that effect I thought.

HUTCHINSON Well, the transmission that went up was when we finished the OMS test today, was that we had gotten every single thing on the flight plan that we had set out to do premission up to this point and I believe the guy that answered, and there were really two answers, was Jack and he made a remark about wanting to be more than 100% and I don't remember whether he said a 101 or 110 or something. And he also said, I'd like to count that 100% when we've finished the landing, in an obvious reference to the fact that we've got a pretty good sized event to go which we are all confident that it's going to be successful.

JULES BERGMAN...Second question, what would you do Monday morning if the STA aircraft cannot see the aim point or the runway or the target point because of blowing dust? Would you then change from White Sands to the Cape or Edwards, or what?

HUTCHINSON I'll tell you. I am really not sure. My inclination is that if we had a weather problem that, in our judgement, at the time we were preparing for reentry was going to put the stops on us, I think we would'nt prepare for entry and we'd probably wait until Tuesday hoping it would clear up. If we had, a lot of it depends on how far down in that preparation period you are. If we were a long ways away, for example, if it was just after the crew woke up and it was an early STA flight in the morning, I suspect we'd probably truck on and get ready and then decide fairly late that, hey, lets just back out of this thing. Probably before we closed the payload bay doors and try again another day. Now you all are aware that we have been managing our consumables to allow us another day or so without any effect and that option exists. It's really hard to say, you know, you just have to get to the situation and look at all the variables and decide what the most prudent course of action is.

Yes sir. Is there any indication...

Would you identify yourself please.

PETER ADAMS...KINET NEWSPAPERS...Is there any indication that the

minor problems that you ran into on this mission will in any way extend the turnaround time. Does it look like these problems can be easily fixed without having any significant extension on turnaround?

HUTCHINSON I can't honestly answer that. I think there are probably a couple of things that are going to have to get looked at pretty close. One is this S-band thing and the other is the tile, obviously. I would guess, generally, electronics boxes aren't the kind of thing that get you in dutch in that regard and the tiles, I just really wouldn't want to speculate. I frankly don't know. It certainly has a potential if we had to go in and densify a bunch of tiles or something like that.

PETER ADAMS...One question for Doctor Pool. Doctor Pool, what have you learned since Skylab that was important in making crew life a bit more comfortable and making crew life a bit more tolerable with this long duration mission. And is there anything that you've learned on this long duration mission that are applicable to future missions in terms of long duration spaceflight?

DR. POOL Well in terms of the habitablility of skylab versus shuttle, skylab was a very habitable spacecraft. It had private sleeping quarters, special galley, nice restroom, the whole works. The shuttle we tried very hard to make habitable although its somewhat smaller. I think the sleeping accomodations are adequate. The galley is to be flown on a future mission. And should add to the habitability situation onboard. The waste management system is new and I think we're still working out some bugs but I think the ultimate results there will also be good. I think the shuttle is a very livable place. They're both very good habitable places to live, I would think. As far as what we've learned in terms of long duration missions. Seven days is a short mission. But I think Dr. Thornton's exercise experiment is very interesting to us. We're very interested in the data from that. We really don't have all the data from that, but after this flight, once we get a chance to talk about it, think about it, look at the postflight data, we will be interested in how exercise can be used as a counter-measure for the deconditioning of spaceflight.

JAMES WILKINSON...BBC...On the question of the tiles, which we haven't talked on recently. You say there's going to be no problem on reentry. Is that an educated guess, or do you have hard evidence that there is no damage to any of the tiles underneath.

HUTCHINSON I don't know anything more than I knew three or four days ago. And we've concluded that, and you've seen all the paper work on that, that we aren't going to have any problems and that's all I know.

WILKINSON And that's an educated guess, rather than based on hard evidence?

HUTCHINSON You could call it that.

We'll get Jules and then we'll go down the line there starting here with Reiser.

JULES Neil,

HUTCHINSON I wanted to blow my nose, but excuse me go ahead.

JULES No go ahead blow your nose.

HUTCHINSON I couldn't get my hankerchief out.

JULES Take your time.

HUTCHINSON No go ahead.

JULES Be my guest, be our guest, we're here at your mercy. Like a tissue?

HUTCHINSON All depends on your prospective.

Your using up your time Jules.

JULES You say you know nothing more about the tiles than you knew three or four days ago.

HUTCHINSON Right.

JULES Yet everyone speaks with such confidence that the tiles will not be a problem. Is it not true that something more is known either through telescopic cameras or recon satellites or some such thing.

HUTCHINSON Not that I know of Jules, we reviewed all the data, I have not seen, and this is the honest injun truth, I have not seen a piece of paper floating around that control center, heard word one after the last tile summary that we saw that looked at our own photographic data prelaunch, looked at the preliftoff, the liftoff pictures with some tile coming off the bottom. Took all the tile counts that we observed with the cameras onboard. The tile that were found on the beach at the Cape. And put all that together in a story, and analyzed each one of those things, and the place they were missing on the vehicle and what was underneath it. You know, whether there was a piece of critical equipment up close to the skin, and so on and so forth. And concluded from that data that we don't have a problem and we don't think we have any other missing tiles. And I don't know anything more than that.

JULES But would have seen it, had the top secret already gone out from the air force or DOD, I assume there are operatives here at NASA to use the KH11 recon-sat or another satellite, or long range cameras from Hawaii or California, would you have seen that data?

HUTCHINSON Obviously I haven't so how could I tell you whether I would have seen it or not. I don't know.

JULES Other words, you don't know.

HUTCHINSON I don't know.

Paul Reiser.

REISER When you test APU 3 tomorrow, and if in fact it

does repeat the ascent experience, will you; 1, use it on entry; and 2, are you, if you do use it are you going to change the procedure on that particular APU?

HUTCHINSON Well first off, see if I understand your question, we're going to start it up tomorrow. You know we have a standard procedure, preentry to use an APU. We were going to use APU 1 as the guy we were going to start up. And the reason for that, there are a couple of reasons, but they're not critical reasons. He has a little more fuel and we changed APU 3, we're going to start him up and we're going to run him a little extra amount of time. And I think the time will probably end up, we normally would have him on for three of four minutes, and we'll probably have him on for 10 or 12. And we are going to go through a sequence that looks at both spray boiler controller A, which is the primary, the system that's on now, that was on in ascent and B, and make sure we have good cooling on both of those. If for some reason the cooling didn't work in either one of those and we have no reason to believe it won't because whatever this phenomenon is that seems to be getting that guy, it's the same sort of thing that happened to us on STS-2. And as your aware that same APU worked well on entry on STS-2 and cooled well. If we were not to get any cooling at all, we will be shutting that APU down before we get into any overtemp condition, probably around 270 degrees or so on the low boil. And I suspect that we'll start him, and I really don't know, I'm not for sure but I would guess we would bring him up a tame about two thirds of the way through the entry, so that we would have cooling. Three APUs during the tough aerodynamic part and he'd run all the way to the ground with no cooling.

John, did you have a question? Okay.

DAVE DUELING...HUNTSVILLE TIMES...Neil, I believe earlier it was said the detector wheel on SUSIM was jammed in position. Is it still, and is there any possibility it might be fixed, or do you have any idea what the problem is?

HUTCHINSON I'm not real intimate with the instrument, intimately familiar with the instrument. It is still partially inoperative. I understand it has something to do with the spectral grating that cycles through the different wavelengths in the ultraviolet frequency. And the answer about fixing it is, no there's really nothing we can do to it. And they are operating, and operating very well. They're extremely pleased with the orbiter's ability to keep them on the sun and the kind of corrections that we're getting, we're continually measuring their instruments, sun center capability and the kind of corrections we're getting thermal distortions in the orbiter body are very very small. So the instrument, at a single grating setting is working well. But I believe that it's still malfunctioned and will complete the flight in that condition.

Right there.

J .N BISNEY...RKO...I wondered if you could just touch, Neil, on the major points of the cap for tomorrow?

HUTCHINSON The biggest thing is right off in the morning. The FCS checkout. I really need to get it out here and take a quick look at it. But the FCS checkout is the big thing for the day tomorrow. We are doing a continual bunch of, we have EEVT, the last electrophoresis sample going on tomorrow. The IECM gas release is also going on tomorrow. Let me make sure I'm looking at the right day here. We are continuing the thermal test in top sun and at the end of the day we've got another one of our check the payload bay doors to make sure we can close them, things. The primary experiment stuff, other than the IECM gas release is, are the IECM gas release, singular, there's only one of those. Are the SUSIM work, looking at the sun. It is not in the terminology of the days that you have seen happen here a busy day. After we get through that early stuff in the morning its mostly, there's a lot of stowage stuff going on and tidying up the ship, getting ready for entry. The crew will be updating all their reentry books, and will probably be out looking at them, just kind of reviewing procedures, and so on and so forth. It's getting ready to come home day, basically. It's like going on a long trip, or after you've been on one, cleaning the car up before you get there.

Jules has another question.

JULES What time do you expect to fire up the APU?

HUTCHINSON I think we're going to do it, are you going to ask me a Houston time? Oh

JULES Take your choice.

HUTCHINSON I guess about, mission elapsed time, Jules around 2230 or so. Quite frankly, someone could get him a very acurate time. I'm looking at the premission flight plan, and we did not, are not deviating much from that at all. 2230 which would be fairly early in the morning, it's a couple of hours after the crew gets up.

Query Desk can call over and get the precise time for you, Jules

HUTCHINSON And it's already been stuck in the flight plans for tomorrow. So, and it's about right where it was planned.

That gentlemen

DICK RATNER...ABC...While you've got the papers out. Has there been any change in the deorbit times and the times on down. The last landing time, I think we got was 27 minutes and 14 seconds past the hour.

HUTCHINSON Well, I'm going to read you, I knew someone would ask that, and I brought the lastest run off the latest vector. And there have been some very slight changes, but again you ought to get this again tomorrow, you know just because the vector continually changes and we're continually tweaking it. Prime deorbit rev is orbit 115, as it was. The ignition time is 7 days, 2 hours, 34 minutes and 57 seconds. We'll arrive at 400,000 feet at 2 days, I'm sorry 2 hours, 56 mintues and 23 seconds. Landing is at 3 hours, 27 minutes and 36 seconds, which is about 15 seconds off the number you quoted me, that's 12:28 p.m. in round numbers.

Thank you.

Okay, thank you very much.

PAO Okay. Good morning and welcome to our change of shift press conference here today with the offgoing Flight Director Tommy Holloway. It seemed like a pretty quiet night to me but I'll let Tommy tell you about that.

HOLLOWAY Well, we came on last night after the crew was talked to the last time before sleep, about 30 minutes before their scheduled sleep time. Through the evening we saw no activity indicating that they were awake. The spacecraft has had no change in status in terms of configuration or failures during this shift. We called the crew at Orroral Valley about 15 or 20 minutes ago and they did not respond during that pass. I expect that was because we either had a configuration problem on the ground and didn't get up or it was inconvenient for them to respond because they hadn't put their wireless headset on yet and/or they were shaving, or so on and so forth, again, without the wireless on and when you're not on the wireless, you have to go to the speaker box and push a button, or sort of push a button, it's really a switch to be able to respond to the call so I suspect they chose not to do that, but we'll find out in a couple of minutes when we get to Mila. We did do some flight planning last night, some crew activity planning last night. The primary changes that were made were minor in that we moved some activities around a little bit to allow the crew the opportunity to stop talking to us and get to bed or relax an hour earlier. Prelaunch, the flight plan had a 7 hour sleep last night before deorbit and it was decided yesterday that we'd add an hour back in and give them a full 8 hours off this evening prior to entry. The SUSIM experiment has encountered a failure yesterday and I'm sure Mr. Hutchinson talked about that last evening. It's unable to change wave lengths and so that has limited the amount of data that we can take, or the pot can take with that experiment and has reduced the time that the crew is involved in that experiment and that was one of the major things that allowed us to have a little more relaxed day today. Additionally, we're also giving the crew the option to pick up the last EEVT sample today that was an extra one that was not planned in the prelaunch flight plan. And that's all I have for a summary so we'll open up for questions.

PAO Okay. I'll call on you and wait for the mike. Mark.

MARK...How are the infamous pair of transponders doing? Any changes whatsoever or suspected changes?

HOLLOWAY Absolutely none at this point.

MARK...(garble) absolutely none meaning that (garble)

PAO Please identify....

JOHN PINE...REUTERS...I'm sorry. Absolutely no changes right through landing I imagine. The transponders as they are now are going to be as they are when they touch tomorrow. As planned?

HOLLOWAY Yes.

PINE...Okay.

PEERS ACKERMAN...TIMES...Are you worried that you haven't heard at all from the astronauts since they were awoken this morning?

HOLLOWAY No sir.

HOLLOWAY Okay. Now start again, we're in??? I don't know why we don't get it working and they don't start talking to us, but right now I'm not worried.

MARK KRAMER...Have you got any new times for the landing sequence. Hutch gave out some new times last night that advised that they constantly change. Do you have any changes?

HOLLOWAY No I didn't bring any with me but when he said that constantly change, he was talking about in the minutes and the seconds area. They're not going to change much. If your needing exact times, you know the closer you wait till the actual event, the better off you are because, you know that sort of thing varies as we move along. (garble) Yeah. Just make something up. That's all right.

PAO Okay. Do we have any more questions here. Yeah, go ahead.

JOHN PINE...REUTERS...Weather's, no change, no major change on the White Sands since you got on the shift. I means it still looks good both sides of ...

HOLLOWAY Yes. I received a weather briefing in again about 1 or 2 a.m. this morning, and as far the weather, is about as I talked to you about yesterday morning and I'm sure as the other 2 flight directors talked to you yesterday, it looks like Monday will be an acceptable day and that's tomorrow now I guess.

Did you burn up any of your extra consumables last night by leaving on some extra electronics for heat. Someone had mentioned that possibility, and therefore, do you still have the 72 hour pad or are you somewhere less than that this morning?

HOLLOWAY We still have a 72 hour pad and yes the crew has been given the okay to stop worrying about their consumable management quite as much as they did earlier in the flight in

that we do have plenty of margin in our consumables in the H-2 area which is the most critical one from the standpoint of electricity.

Okay. If we have nothing else, I understand that we didn't have any questions from the other centers. Is that correct?

That's correct. No questions from the other centers.

Okay. Well, thank you all for coming out to this early morning session and we'll see you at the next one.

END OF TAPE

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END OF TAPE

Good afternoon and welcome to the change of shift briefing with Harold Draughon, the Flight Director for the Crystal Team. Let's begin with Harold's summary of this most recent change of shift here.

HAROLD DRAUGHON Okay, this morning's shift started out with the flight control systems checkout. Normally that activity is composed just of a wringing out of the flight control displays on the vehicle, the ADI, the eight ball, the rate meters, the normal aircraft type instruments and the sensors, the altimeters, the radars, the TACANs, those kinds of things. You've all been aware of the anomally with APU number 3 during ascent and so what we did today, as I told you yesterday that we probably would, we brought forward a check that we normally do not during entry prep which is a flight, we have, the flight control system checkouts are part 1 and a part 2, the way it's documented. Part 2 is the dedicated display checkout, the sensor test and the other one, part 1 is the APU where we crank the APU and actually use the horsepower from the hydraulic system to move the vehicle's control surfaces. So we brought that forward today to combine those two tests into one test segment and get a good wring out of the APU water boiler, the cooling system on the APU. Both the FCS checkout and the APU are 100 percent successful. We did not find a single thing wrong with any of the avionics. Nothing wrong with the flight control systems, the hydraulics, the APU regulated right up at the temperatures it was supposed to and that really wasn't a surprise. APU 3 has had a similar malfunction to the or we've had the same lack of understanding of how APU number 3 works in ascent on all three flights. It is not worked the way we thought it would on any of the flights and it always works correctly on orbit and for entry. You probably, if you've been coming to all these things you recall those kind of discussions, it's always APU number 3. So that checkout went well. We followed that up with the we call it an RCS hot fire, that's an activity where we, the way the control system on orbit works, as you try to do attitude, or translational maneuvers, the digital autopilot in the vehicle decides which thrusters to fire to accomplish a particular maneuver. Clearly there is more than one set of thrusters that will accomplish a given rotation. But the autopilot always uses the same ones. Rather than get into entry and find out that you've got several thrusters that you haven't tried to fire for seven or eight days, we take this block of time and schedule out a very specific sequence that will test every thruster to make sure we go on into entry with a known set of hardware. Every thruster checked out correctly. So, all the testing we did today that was a precursor to the entry operations tomorrow, was 100 percent successful. Another activity that's gone on since yesterday, I think I told you that on the first sleep cycle, we changed a gyro bias, which is a compensation term on one of the IMU gyro's the first night, and that was when we were in the tail sun attitude. We changed thermal attitudes yesterday as you recall and went into a top sun. The gyros are

sensitive to the thermal environment and we think what we're seeing is a response to the new thermal attitude to that particular sensor. We put new gyro bias terms in for 3 accelerometers on IMUs number 1 and 2. They changed once, they haven't changed since then and we think we've zeroed out those terms and expect them to work properly. The circulation pumps which are some small pumps that circulate the hydraulic fluid through the hydraulic loops while we are not trying to use them to move the control surfaces, but just to keep heat distribution to where you want it, we were running those in all of these test attitudes to get again to get a good handle on heat transfer and get the thermal models that the guys use in analyzing missions down, we've decided to run those on through the sleep period tonight and we will terminate circ pump operations tomorrow morning. The exact time hasn't been scheduled yet, but it'll be sometime like 6 hours prior to deorbit. The loops are actually, the problem you worry about with circulation pumps the reason they are there is you worry about a local spot in the loop getting cold and then later on when you want to flow hydraulic fluid to move a surface if you've got a cold enough place that you've frozen the loop up, then of course you can't get any fluid and you can't move the actuator. The loops are actually running a little warmer than had been anticipated. We are bringing them on now at 0 they've got a temperature mode that they are controlled to. We're bringing them on at 0 degrees and then turning them back off at +20. The kind of numbers that we were talking about trying to protect preflight were -10 and you begin to get a little more concerned at like -30 degrees. So we are well away from any concern. The N2 reg or the N2 leak was in the system 2 that we talked about a couple of times that I told you yesterday or the day before that we have isolated that to the PCS system 2. The number 2 distribution system in an effort to get a leg up on the turnaround post flight, we had narrowed it down to which system the leak was in. The one thing that had been common to all the times when we had that thing in different configurations and had seen the leak was that the system was very cold on all of those occasions. There had been times when we'd had it in other configurations that had not leaked so today we are running one additional check that's designed to determine if the leak is indeed correlated to the thermal environment or if it's a mechanical problem. Just to help the KSC folks when they're chasing that problem post flight. The most recent development is one with CRT number 1 in the keyboard. One of the keys doesn't seem to have an interface with one of the CRTs. That happened just as Neil and I were handing over a minute ago. The plan of attack when I left there half an hour ago was to, the easiest thing to do is to change out that particular key with one of the keys similar keys on the aft keyboard since you don't need that during entry. If that is unsuccessful then you'd change out the whole DEU or DDU display electronics which is a kind of a special processing minicomputer box. We have done that before. Joe Engle changed out one on the last flight. In flight he did that. Takes about an hour to do. As far as entry we plan to reenter on the nominal published rev tomorrow, rev 115. The

deorbit maneuver is currently 285, for folks who like numbers, 285 feet per second. That will require about 6,000 pounds of fuel. We've computed that maneuver so that we have a downmoding option to in case we could not get the engines to work and there's no reason to believe that they wouldn't but we always like to have two or three ways to do something. We've computed that maneuver so that we could execute it two minutes after the nominal time and use the RCS engines, the four + X RCS engines, and accomplish a deorbit off that same solution to the same targets. Our landing time is 12:34, that's 3 minutes different than what I told you the last time.

12:34?

HAROLD DRAUGHON 12:34 at Northrup, not here.

12:34 Mountain time?

HAROLD DRAUGHON I think they are Pacific, aren't they? Whatever.

Could we get an MET perhaps? Matter of fact, I'd like (garble) get some numbers starting with the deorbit burn (garble).

HAROLD DRAUGHON Okay, I've got that data. Let me go on through this. UHF coverage and we have got UHF coverage at ignition for the burn over the Yarragadee station in Australia, course we won't have any telemetry from that station but at least we can talk to the crew. After the burn is over we will see them again at Guam for 5 and 1/2 minutes with telemetry. We'll briefly talk to them there and discuss their configuration and what not. There's nothing mandatory at least to go with that pass, it's just a good opportunity to look at them after the burn and prior to entry. They go into blackout and since we're now landing at Northrup course they come in over the coast, California coast, higher and faster, but the C-band radars can track the fire ball, what you'll refer to as blackout. They can track the fire ball and give us very useable trajectory data. So we'll be tracking them a lot higher than we normally do when we're coming into Edwards because the fire ball will be over the horizon for the west coast radars. Normal systems data we would have are for telemetry and S-band voice. You lose Goldstone and Buckhorn at about 2 and 1/2 minutes after they come out of blackout. For this flight there have been two S-band systems activated at White Sands that are that can give us real time data routed back to here. It doesn't have all the redundancy and geographic routing and all the backup systems that one of our normal stations does, but when we committed to land there the Goddard Spaceflight folks went to work and got us the quickest thing they could to give us the capability there. That system is in place. We've been using it on a daily basis and the data is fairly stable. It has a few more dropouts than a normal state end site does, but they don't have the same kind of RF receivers that the rest of our stations do, but it's quite usable. Any questions?

Yes sir, right here please.

JOHN BENCH CHICAGO TRIBUNE John Bench, Chicago Tribune. If you decided tomorrow that you wanted to come in 1 rev early for the wind conditions, is that exactly 90 minutes early or there in other words 12:34, that'll be like 11:04 would be the time you'd be landing, or do you have an exact time?

HAROLD DRAUGHON GMT 1701 for rev 114, 1835 for rev 115, the prime rev. I think we have MET there too. PET is 1 0, 7 days 1 hour and 1 minute, nominal rev 2 hours and 35 minutes.

JOHN BENCH CHICAGO TRIBUNE What's the local time on that again for the

HAROLD DRAUGHON For the local where, here?

JOHN BENCH CHICAGO TRIBUNE The local there. In other words, if it's going to be 12:34 there what would it be 1 rev earlier?

HAROLD DRAUGHON Hour and half earlier. It looks like it's an hour and 34 minutes.

JOHN BENCH CHICAGO TRIBUNE An hour and 34 minutes earlier.

HAROLD DRAUGHON Yes.

George Alexander, please.

GEORGE ALEXANDER Harold, the reentry fire ball. Is there any chance it might be visible to residents of southern California albiet it's in the morning?

HAROLD DRAUGHON I'm guessing but I would think not. I think the sun angles would be up too high. The local landing time is around noon. It's even on the west coast. It's the same rev we come into Northrup on, I'm guessing, but I suspect not.

Roy Neil of NBC

ROY NEIL NBC Now could you give us some hard clock numbers starting with deorbit burn so we can follow you in. Perhaps in MET's so we all are working on the same clock.

HAROLD DRAUGHON Okay, let me see what rabbit I can pull out of this hat here.

Here I can help you with that. Go ahead with any numbers you got there.

HAROLD DRAUGHON You don't mean that. Okay, let me find out. Can we all work in you want to work in MET or central standard time?

ROY NEIL NBC MET or central standard time.

HAROLD DRAUGHON Thank you. That was very helpful. Let's work in mission elapsed time. That'd be easy to add to the clock. Entry interface, well I gave you TIG, GMT PET of TIG is 7 days 2 hours 34 minutes. PET is phase elapsed time or mission elapsed time. Entry interface is 2 hours 7:02:56. Let me get with the PET. 7:2:34, 7:2:56 for entry interface which is 200,000 feet in a place you should start active guidance.

ROY NEIL NBC 200 or 400?

HAROLD DRAUGHON 400 K. And in beginning the blackout for S-band is 7:02:59. End of blackout 7:03:14. I don't know what numbers you're interested in. The air data system deployment is at 7:03:20 if you're pilots, anybody. TAEM interface which is the place that we change guidance up modes within the entry guidance and it's also happens the place that you fly through MACH 2.4 is 7:03:21. A lot of our decision processes are keyed around that particular event. The vent doors are opened at 7:03:21. Auto land interface is 7:03:27. That's another change in guidance logic. uidance logic in entry is, there's entry guidance that takes over at 400,000 feet at .05 g. That flies you down to TAEM which is Mach 2.4 at about 80,000 feet, and that flies you down to approach and land guidance which flies you around the HAC circle and through landing. And touchdown is 7:03:27. That is the PET of TIG, 34, yes. Okay.

(garble) That's right. That's correct. I tried correcting it in pen and those corrections are wrong. The type written versions are what's correct.

HAROLD DRAUGHON Don, I'm afraid all we've done is confuse the issue here right now. I think we'd better get this very straight.

DON Well there's a handout that came out earlier today that got it typewritten and the typewritten times and they're just completely faithful to what Harold told you.

HAROLD DRAUGHON These are hard copies out of control center and these were taken off of that, so if you get a copy of this you should have the right data. And it'll change a few seconds, you know, by the night as the orbit changes a little bit, so.

DON Harold gave you a couple of figures like TAEM interface and some of the others, auto land, that we didn't have on the typewritten thing. Pete, right here, please.

AL SALES BALTIMORE SUN Al Sales, Baltimore Sun. Sometime between Thursday or Friday and perhaps yesterday afternoon, touchdown time changed from 27 minutes after the hour to 34 minutes after the hour, as I understand it at least. Is that

correct, and if so, how come?

HAROLD DRAUGHON We just changed it back, it's 27 after isn't it? 37 after.

DON It shouldn't have changed that much.

HAROLD DRAUGHON It should not changed that much.

AL SALES BOWMAN TIMES It should be then 27 after the hour, is that what you're telling me?

HAROLD DRAUGHON 27, yes. Yes. No. It's not anything, it's 27. Not a lot of things. Craig Corvalt, Pete please.

CRAIG CORVALT AVIATION WEEK Craig Corvalt, Aviation Week Hal, would you discuss as per what was transmitted up to them. Pros and cons of the right hand turn and be specific on things like getting a little hot coming around that side of the HAC if you have to be in there.

HAROLD DRAUGHON That's an interesting topic. The and we got into this a little the other day with the HAC turn angles. If everything were equal a crewman would prefer to turn left, make a left hand turn, onto the runway. The reason is the guy on the left side is driving the bus and he can see where he's going. You've got plenty of instruments to follow if you want to turn the other way and there's a fair amount of visibility even then. We have if you have a large tailwind when you're coming up onto the HAC it's a little more difficult to fly an exact circular groundtrack, earth relative, because the winds tend to blow you off of that. You have to keep steepening, changing your bank, as you go around the turn. There is a G limit on the aircraft and if the wind is big enough you cannot keep from pulling more g's or going into a bank angle at a particular airspeed that would pull more g's than we want to pull on the aircraft. The way you get around that is rather than flying this very precise circle, predefined groundtrack, you'd turn it a little earlier than you need to, let the wind, because the air mass you're moving in is moving, you would let the wind take you onto the HAC and a little past it and then you come back out. So you bias it going in and you get blown off and you come out on the other side. We have done a lot of training and a lot of simulations and figured out when the that your sensivity to that process is clearly a function of how long a turn you're on the HAC. If you're only going to come and just turn 90 degrees around the circle and land that's one thing. If you're coming in and got to go half way around the circle you're going to be a lot more sensitive. The wind is working on you a lot longer. If you got to go all the way around then the wind's going to work on you a lot more. So it's there are a lot of parameters that vary. We've done a lot of simulations on that and figured out that the right set of things to make you revert back from a left hand turn with a better visibility for the commander is a criteria that

does something like if the HAC turn is greater than 270 degrees and the winds are larger than 70 to 80 knots of tailwind at the place you're going to encounter the HAC, then you ought to quit trying to make a left hand turn and make a right hand turn which will have a smaller turn angle and you wouldn't have to bother with the winds as much. And the thing that changes there is now that wind helps you get to where you're going quicker and you're going not as far around the HAC so you're flying a shorter range. Therefore, you just tend to get pulling out onto your final heading runnway heading with more energy. The way we combat that is the thing that we were discussing with the crew and we ought to take the speedbrake and it's normally at I believe it's either 45 percent or 65 percent and at Mach .95 just as you go subsonic we're going to take the speedbrake from that intermediate position that it has been at for quite a few Mach numbers and open it wide up, wide open, to kill off a little more of that energy. It's not a problem that the vehicle and the guidance and the crew can solve a problem of landing at the lake bed at the runway. There's absolutely no problem in converging all of that. The major problem that you have to deal with is if you don't do something to slow down a little bit you're trying to rendezvous with those chase aircraft who are going to be taking some still pictures and getting some engineering data and they give the crew some airspeed calls. So you're going to go by them so fast that they just can't catch up with you. So it's a rendezvous problem with the chase aircraft more than anything else. That's really the only issue.

CRAIG CORVALT AVIATION WEEK A couple follows, then it would not affect if they were a little hot on the last part of the HAC. It would not affect the nominally your goal for auto land.

HAROLD DRAUGHON No, you'd converge those errors much before that. If you had planned to make a left hand turn and had decided late to go to a right hand turn you would be a little hot at that instant that you decided to take this other route to the touchdown point because you'd go a shorter path. But soon after you tell the computer that you want go this other route it will quickly figure out that it's too hot and it'll dissipate the energy.

CRAIG CORVALT AVIATION WEEK And one last one. How much higher will you be able to see them on C-band this time as opposed to Edwards landing?

HAROLD DRAUGHON Way up, Mach 18, probably.

CRAIG CORVALT AVIATION WEEK as opposed to

HAROLD DRAUGHON 14, it's quite high. I could get you a better number later on that.

They're coming in

PETER LARSON ORLANDO CENTENIAL STAR Peter Larson, Orlando Centenial Star. You're goirg to come down autoland to 200 feet this time?

HAROLD DRAUGHON That's correct.

PETER LARSON As opposed to what was it 2,000 last time?

HAROLD DRAUGHON It was something like that.

PETER LARSON And you'll be flying additional maneuvers still to increase the aerodynamic pressures or?

HAROLD DRAUGHON To just get some response data on the aerodynamics of the vehicle, not in that particular flight regime we won't be but up and away, we have other test maneuvers that are different than the ones we flew last time.

If we could get the gentleman way in the back, please.

JERRY HANNAFAN TIME MAGAZINE Jerry Hannafan, Time Magazine. Couple of quick ones. What is the g limit on the aircraft, on the spacecraft?

HAROLD DRAUGHON 2 g's.

JERRY HANNAFAN And what's going to be your altitude and Mach numbers as you go over Los Angeles and Phoenix and will you estimate the sonic boom hitting the ground?

HAROLD DRAUGHON I can't give you those numbers from memory. I know that they have been looked at and judged to not be a problem. The reason being that the altitudes are so high that as we come across there that they shouldn't be a problem by the time the shock wave gets to the ground.

JERRY HANNAFAN Do you have an estimate on Los Angeles?

HAROLD DRAUGHON I really don't we're going to be way up.

JERRY HANNAFAN Over 100,000?

HAROLD DRAUGHON I honestly don't know. I doubt that we're over 100 though. The g limit is, Jerry, we're probably over 100,000 there.

DON We probably are over 100 K there. G limit is different for ascent isn't it. Yes, and well when you ask a question like what the g limit is it there're a lot of ways to answer that. There is operational envelope g limit that we normally plan to design flights to. There are factors of safety in their structural limits and their ultimate limits. You can over g an aircraft and you got to go X-ray something you can go

to another g limit and you bend something and sooner or later you can pull something off the aircraft. 2 g's is the limit that we don't design trajectories to exceed. If we took it to 2 and 1/2 g's we would not have a concern about reflying the aircraft.

JERRY HANNAFAN And again, that's entry.

HAROLD DRAUGHON Yes it is.

DON John Disney.

JOHN DISNEY The APU test this morning. Did that show you then that the 3rd APU will be functional and it'll be started along with the other two and that you can use it all the way through the landing phase?

HAROLD DRAUGHON. Yes, the APU is 100 percent. We ran it for about 10 and 1/2 minutes. The water spray boiler regulated the oil temp to 255 degrees. It's supposed to reg between 240 and 260. It was right on the money. It's got A and a B controller. We checked them both out.

JOHN DISNEY One other question for you. On STS-2 when we saw those little plumes from, I don't know if it was the RCS or the verniers as they came in just before landing, I'm wondering were those manually or automatically being fired.

HAROLD DRAUGHON Those are the RCS.

DON I didn't see them.

HAROLD DRAUGHON The contrails?

JOHN DISNEY Right.

HAROLD DRAUGHON No that was neither. It was just not any aircraft.

DON There were some RCS jets firing, forward RCS and it was firing during aero entry.

HAROLD DRAUGHON Where did you see this from, from a cockpit camera or from the ground?

JOHN DISNEY From a chase plane camera I think or ground.

DON It's got to be from chase plane.

HAROLD DRAUGHON And it's got to be from above Mach 1. All the jets are turned off at Mach 1. We don't use them beyond that. The nose jets are turned off essentially on orbit at a very low Q bar. We come in with attitude control in just the aft jets. And if you saw the jets firing it would be the aft jets and roll yaw.

JOHN DISNEY What I'm asking is whether those firings were manual or automatic?

HAROLD DRAUGHON At Mach 1 they would have been manually induced, manual crew inputs. They could be either but that particular part of trajectory is under manual control.

DON Paul Reser.

PAUL RESER How do the mechanics differ if you're coming in a rev early or a rev late or several that is are you doing your deorbit further west or further east and using up more crossrange and if so how much and etc?

HAROLD DRAUGHON The crossrange you have to fly is purely a function of if you look at the Mercater maps, the sinusoidal groundtracks, if you look at where the geographic location of the landing site is with regard to the Mercater projection. That determines the crossrange whether how far it is away from it and on the north or the south. The downrange problem is all the same. You just pick you just go back the right downtrack range and do the entry maneuver there, but you still got that crossrange to fly out.

PAUL RESER So most of the adjustment for coming in early orbit or a later orbit is in the crossrange.

HAROLD DRAUGHON No, its in the ignition time.

DON Well, ignition time and then later the crossrange.

HAROLD DRAUGHON The crossrange comes out. It's a non issue as long as it's not too large. With our current knowledge of the L over D of the vehicle the crossrange capability of the aircraft, we try not to pick landing fields that are above about 800 miles away from the groundtrack. As we learn more and more about the aerodynamics of the vehicle we intend we expect that number to go up above 1,000. Right now we operate with 800.

DON L over D is lift 2 words over drag. Wayne Dolcefino, right next to you Pete, please.

WAYNE DOLCEFINO Have you developed a procedure for checking the S-band system post landing maybe during roll out?

HAROLD DRAUGHON There's one being developed. My comm specialist is in a meeting right now with those people so that he will understand that thing quite well. After landing and we have an exchange crew like we had last flight that's going in soon, as soon as we get the APU's shut down then the people out of SCAPE suits can go up to the vehicle and we'll open the doors, change out the crew, get the exchange crew in. We already planned for the exchange crew to do a lot of the vehicle powerdown that the

flight crew did last flight but in addition to that which is normally the place I would hand over the control of the thing to the KSC folks we're tacking on to that a comm checkout we don't know how long it will run. Sometime between 30 minutes, an hour and a half.

WAYNE DOLCEFINO It's my understanding that all you're going to basically do is just reset it and see if it works and that was something you were afraid to do in flight is that not too general?

HAROLD DRAUGHON There's more to it than that.

DAVE DOOLING Huntsville Times Has the last run been completed on the EEVT and are you starting to shutdown the instruments on the OSS-1 pallet or will that wait until tomorrow?

DRAUGHON The final deactivation is tomorrow I believe the last EEVT run which was a kidney cell run has been completed.

MORTON DEAN CBS News Could you looking back over the past few days, could you give us a thumbnail assessment of how the ship performed and how the astronauts did?

DRAUGHON I think the ship has performed beautifully, the execute shifts that I have been on have been just a piece of cake to walk through. They're have been just no issues at all hardly to write about. It takes me 35 minutes to write my shift handover which is a thorough briefing to the oncoming flight director. That's not alot to write about. There's just not much going on and an anomaly sense. The only thing of significance at all was perhaps the payload bay door incident after the first thermal test and that was readily cleared. That got us a little bit off the timeline going back to top sun and thermally preconditioning the seals and proving that door closure capability at that time. Other than that, and another good gauge that, another way to tell when we're things we don't normally plan to do is to look at the traffic that goes up each night to modify the next day's activity. You take the CAP and write all of those things into it that we're gonna do differently it's just a smattering of things, not much at all. It's been very successful.

DEAN I had a followup to that but getting back with all the problems that were encountered certainly on the shifts, could you look at the mission and once again give us an assessment, not only of how the ship performed but how the astronauts performed.

DRAUGHON Yea, I think the ship has performed very well. The thermal to try and quantify it for you the thermal response has been, has shown us I think, and this is preliminary, but the thermal extremes are not as severe as I was lead to believe that they would be. The vehicle responds slower thermally, does not seem to get as cold or as hot as we had thought it might. So, I think we have reason to be very optimistic about what the long term data reduction is going to show us there. The crew was a slow, a little bit slow getting started because of the their motion sickness but in the, after the first day and a half or so of that, with a little bit of adjustment, the last few days all the tell tale signs that tell you, that that's completely gone are there. They're looking for new and unique things to do. T' /'re volunteering, yesterday on my shift they volunteered another TV pass of the bees and moths. They're all the time looking for extra things to do and volunteering things and that was not something that we do in the first, during the first two

days, so it's quite clear that they're back on their feet, so to speak, and going about business and looking for extra things to do.

ERIC INGBERG CBS News A three part question on the S-band. Has there been any change in the status of that equipment during your shift.

DRAUGHON None whatsoever. We had, the only COMM related activity was, we had a UHF receiver that failed at Yarragadee, went through about half of a pass thinking that we might have a COMM problem and it turned out to be the ground receiver that we switched it out and got COMM back there. Nothing has changed.

INGBERG Do you still have one downlink channel on the high power mode?

DRAUGHON That's correct.

INGBERG At what point in the reentry sequence tomorrow is it no longer important to have S-band downlink capability?

DRAUGHON It varies. All of our instrumentation is on the S-band. The only thing we have on UHF is voice, air-to-ground communications. Any systems monitoring that the ground is gonna do depends on that telemetry. The only way we can aid the crew if we don't have that telemetry is for them to describe indications and meter readings to us and then we can assess from that. So as long as you want us to provide that service, then all the way to the ground you need the voice. Had we not gotten these 2 S-band antennas out at Northrup strip, we were perfectly willing to have LOS, or loss of telemetry, 2 1/2 minutes after blackout and have the crew fly from there to the ground with us just having UHF voice. And the way you would do that would be with a thing that's called the Entry Pocket checklist and it's a what you see in the cockpit of any major aircraft. It's that little book like this with the systems tagged on there and you flip it open and it tells you what to do if an APU malfunctions or if a cooling system malfunctions or what have you. It gives you 4 or 5 little steps to do, this, this, and this. And what the ground provides is another level of sophistication to that support.

PAO Let me take one more question here and then go to Kennedy and take care of those guys, then come back to Houston.

JULES BERGMAN ABC News Harold, if you were tracing out the major or failures that need attention on this flight before the next flight, before STS-4, what would you put down on your list?

DRAUGHON The only significant thing that needs attention right now, and I hope I don't forget something, is the communications system. We need to psych out what we've really got going there. The other major systems that are involved, but

I don't think they're a major issue, are the APU. That silly APU has done that for 3 flights in a row, it gets hot towards the laterpartofascentanditworksgreateverywhereelse.We need to figure out what's going on there and perhaps modify the system so that that unit doesn't do that. But it's not a problem. The only other semi-glitch that we had was the payload bay door response after the tail sun attitude. That particular thing was cured with a 15 minute transfer to top sun to heat up the seals or the latch mechanisms whichever one it was, and that was a stressful thermal attitude that was put there as a test to try to stress to system.

BERGMAN How about the payload bay door, payload bay cameras, wouldn't you include those?

DRAUGHON Yes, the payload bay cameras do need some attention and more than likely, and I'm guessing some, but more than likely there's also a thermally-related problem and the DAC cameras, those DAC cameras haven't performed that well.

PAO Okay, let's go to Kennedy Space Center, Florida for some questions, then we'll come back here to Houston. Please identify yourself.

DICK LEWIS Chicago Sun Times I have 2 questions. What is the length of the deorbit burn?

DRAUGHON Two minutes and 40.8 seconds.

LEWIS Two minutes and what?

DRAUGHON Two minutes 41 seconds.

LEWIS And both engines?

DRAUGHON Yes, that's a 2 OMS engine burn. If you only used one it would just double it.

LEWIS And second question. When does autoland take over? When do you go on autoland on the descent?

DRAUGHON It's at around 1600 feet just as you're on like the last 10 degrees of HAC turn coming onto the final approach azimuth, getting lined up with the runway.

LEWIS Shuts off at 200?

DRAUGHON At roughly 200 feet assuming there are no systems failures on the vehicle.

LEWIS Thank you.

TOM BOLE Conservative Publishing Co., Timpton, Iowa With you're final groundtrack being over the land, are there any further chase aircraft, such as higher performance maybe SR-71 or F15B?

DRAUGHON No, those aircraft can go high. But not at those speeds. They couldn't stay up with you.

BOLE What's the altitude crossing the coastline?

DRAUGHON I honestly don't have that number. I don't know.

PAO Yeah, that's been asked before, we don't have it here, but we can sure get it to you and we will make it available here and phone it to you guys at Kennedy.

BOLE Thank you sir.

PAO Do we have anymore questions here at Kennedy?

PAO Okay, that's all for KSC.

PAO Our altitude coming across the coastline is 190,000 feet. Did Kennedy copy that?

PEERS ACKERMAN Times of London If you've got a closeout crew coming aboard to do the shutdown this time, does this mean the astronauts will be coming off the craft earlier than they have on the previous 2 shuttles.

DRAUGHON There is a potential for that. I can't guarantee that, but we're trying to relieve those guys of those chores. You never know what kind of postmission, we try to perserve, if we do have any anomalies, one thing we do try to do in the post-landing and it's exactly what we doing in this COMM case. Alot of times, if you shut one of those systems down then bring it back up 2 days later you've destroyed the evidence, the problem won't be there anymore, and you don't know how to fix it. So, we don't want to keep a flight crew around for those kind of things, so we just routinely setting up a routine way of going about getting the crew out and putting some other guys in there.

ACKERMAN Have the previous crews complained about the amount of time spent in shutdown exercises?

DRAUGHON No, John on flight 1 was anxious to get out and run around the vehicle, but no, no one has complained of it.

CARLOS BYARS Getting back to recommendations that might be made as far as changes go. Will you, or you know of anyone that's going to make a recommendation as far as the radio communication system is concerned, that you get rid of a single black box that has everything going through it? That seems to be what has thoroughly disrupted your redundancy.

DRAUGHON Well, I don't know, Carlos, if that's the right way to describe that system. Perhaps they are in one enclosure, I don't even know that, but even if they are, there are a bunch of submodules in there that, if you draw them out on a schematic, and I have schematics here, off the COMM system, they are, it is modularized. There is 2 or 3 of all those components in there and the GSEL that you've been told about some, selects you a different encoder, a different transmitter, a different power amplifier, so it may be in one hardware box, but it's, there's a lot of redundancy in that box.

JAMES WILKINSON BBC I have two questions. Can you just go over again very briefly, when they come out of the blackout, are we going to be able to hear them from then on in, or is there a period before.

DRAUGHON You wouldn't be able to hear them any differently than you could before. There are two things that govern when you can hear them and when you can't. One, you got to be able to station with an antenna, within the line of sight and the other one is you got to be below a certain velocity at a certain altitude so you don't have the fireball that's an ionized sheath around the vehicle it won't let RF out. Coming to Edwards, we were, we had an antenna with a look angle to the vehicle, when it got to a flight condition that would allow us to communicate. At Northrup we ha[ve] that same condition, and because Edwards is up range of it, w[e] have been looking at this fireball alot longer, so we will acq[uire] them at the same velocity and altitude that we always did. It's just that Northrup we see them for alot longer before we can talk to them because of the fireball.

WILKINSON Yes, I appreciate that, but sorry, for a simple-minded Englishman, after they've come out of the fireball and they are back in contact with you. You then have an antenna on them from then on until they land?

DRAUGHON Yes, we do.

WILKINSON Fine, and one other question. On the autoland, again I'm sure you've covered this, but I haven't caught up with it yet. Am I right in saying they fly the thing manually until 1600 feet? Then autoland takes over, and then they take it back again to fly it manually for the last 200 feet.

DRAUGHON Yes, that's correct. There is another precision navigation that comes into being at about that altitude, that's called a microwave landing system. It's the standard kind of system that's used on aircraft carrier approaches and on anybody trying to make a zero-zero approach in weathered-in aircraft. [We] 're waiting to go into the autoland test until the orbiter acquires that ground transmitter, locks up on it, and we know that the onboard navigation system is being, is receiving this very precision data. Then we give it to the system.

MARK KRAMER Back to landing for a moment, if you will. Can you describe the precise criteria which must be met to have a landing c.. not 1 7, but I guess 3 5, or is that not considered.

DRAUGHON I can tell you that the criteria that we will be used in selecting the landing runway. The highest objective that we have for this particular landing is to get a crosswind landing. The range that we are willing to accept in a crosswind is between 10 and 15 knots, perpendicular, component of crosswind. If it smaller than that or much, and these things are a little bit gray, I mean, I sure we would take 9 and a half. Somewhere around there you, it becomes so small that you might as well not do it. You're not going to get enough data, if it gets a lot bigger than that, its more than we want to do the first time out. We would rather land into a headwind. The second highest objective is to get the autoland test. The only runway at Northrup that's instrumented with one of these microwave systems is runway 17. At Edwards there were two runways that we could do that on, so if you can you will go to a runway thats got the right crosswind component, if you can't do that you'll try to do a autoland test, and within all of that you've got to get one that's got an acceptable headwind tailwind crosswind.

KRAMER I guess I'm more confused than I thought I was. s there a runway 23 also at Northrup.

HUTCHINSON There is ...

Are there two strips there.

HUTCHINSON There is 05 that's ...

05 and 23,

HUTCHINSON Yes

And 17 and 35.

HUTCHINSON That's right.

Do you contemplate ever landing on 35.

HUTCHINSON It would be a unusual wind that would have me do that.

So you're principal choices are 17 or 23. Okay.

HUTCHINSON But its purely a function of the groundwinds. Where ever the ground wind is blowing we are going to go with the c 'teria that I discussed.

These are the same runways that you have at Edwards, aren't they?

HUTCHINSON They have four but we have a lot more.

Yes but I mean those are the two prime ones.

HUTCHINSON 22/04 rather than 23/05.

Why don't you get that one way in the back there who hasn't had a chance to ask a question there.

CLIFFORD COLLERLY...DAILY COUGAR...For the, after the landing will the exchange crew remove the plant growth unit or that be done a little bit later on.

HUTCHINSON The flight crew is not doing it. I doubt that the exchange crew is doing it too. I believe one of the early tasks that the exchange crew does it package up a bunch of film and other stuff that needs to be taken off the aircraft right away and I don't know who they give it to, somebody comes up there and gets it and some real spiffy like they put in a baggie. I mean its a big trash bagger, store a lot of stuff in and they hand it to some guys.

Would the film, or would the PGU be included with the film.

HUTCHINSON I doubt that the PGU is in that set. It's got some other environmental constraints on it, I believe and I'm sure they're handling it a little more carefully and there is a minimum time limit on getting the PGU out, I don't know what it is, the exchange crew won't do that, they'll take it out and give it to somebody that will take it away.

Craig Corvalt please.

CRAIG CORVALT...AVAITION WEEK...I want to make sure I understand your tossing around to altitude 1600 feet here. My understanding is your actually go for reengage auto flight controller about 16,000, turn on the final...

HUTCHINSON I made that mistake, it is 16,000

CRAIG CORVALT...And then you transition auto land guidance as low as 6,000 feet when you get everything settled out and ...

HUTCHINSON Yes there are a lot of criteria before the onboard software will actually engage auto land. Just because you ask it to take control of the ship and go into the auto land control mode, it won't do that unless you're within a very narrow capture envelope. We let the craft continue to try to converge those errors down to that criteria, that meets that criteria as low as 6,000 feet. If it hadn't made it by then, then we have the crew take over and begin to fly it again.

CRAIG CORVALT...And secondly if you are unable to restore CRT 1, could you review briefly the ability to fly the aeroentry maneuvers with the other two remaining forward CRTs. The procedure there.

HUTCHINSON Well its hard to conceive that we wouldn't be able to get it back because we can change it out, we can take the fourth one out of the back and put it up front. But if you couldn't, if you can't do that for some reason, or if that doesn't work, the C3 unit is between the two crewman and lower down and I'm sure that's the one Jack would use and in which to execute the maneuvers. I think he could, have adequate visibility to do that.

Just wouldn't display the BFS.

Please wait for the mike

HUTCHINSON You would reallocate where you were going to look at SM, or the BFS function.

Mr. Sehlstedt.

HAL SEHLSTEDT...BALTIMORE SUN...One more brief question on the problems. Are these kinds of problems such as you've had with the APU, the kinds of problems that would, will normally occur in the operation of the shuttle when it becomes operational? Are these the kinds of things that you will just live with, just as a person driving a car lives with an overheated radiator, or are these the kinds of problems you expect to get rid of? In other words do you expect to fly, say a year from now, a nearly perfect aircraft or do you expect a certain number of problems to occur all the time? Or can you say?

HUTCHINSON Yes, I can speak to that. We certainly do not expect to have a perfect vehicle that's never going to have problems, that's why we have the redundancy in the vehicle that we do. The reason that we are as cautious as we are now, is you've got to make sure that you have a lot of confidence on the redundancy that you have. That when something fails that it's not a generic problem, that if this one fails probably your other two backups will go right behind it. So anytime in a development test program or a flight test program you're rather cautious at the onset. After a while, if the APU doesn't work, you'll log it, and go on and fly the full duration of the mission, when you land and the guys will come up and change it out for you.

Peter Larsen

PETER LARSEN... Just to go over this one more time. The icrowave beam auto land system, it's from 16,000 feet down to 200 feet this time?

Yes, I think we're confusing microwave with auto land. MSBLS and autoland...

HUTCHINSON The microwave system is a navigation guidance aid, its acuracies are required to successfully do autoland. But it operates from, and it depends, its a fixed antenna and it has a certain size beam. When you get within that beam and going more or less towards it. You will lock up on its data.

PETER LARSEN...But the autoland the is within 16,000 to 200 feet.

HUTCHINSON We expect to acquire that data,have two way communications with that instrument and be able to assess that that data is being processed by the onboard computers in that general range. And it could be 200 higher or 500 lower but generaly in that range.

Paul Reiser please.

PAUL REISER...Just as we were coming over here and if I understood it correctly we were talking about the CRT problem, they were saying they were trying to fix it with the keys and if they were unable to they were going to have to, it involved a much more complex repair in which they would have to go back in some panels. Could you kind of go over that a little bit.

HUTCHINSON The keyboard, its like the terminals you've got out here, its hexidecimal system with numbers and numonics and a few keys that are special function keys like a proceed and execute or just like a equals and plus on your calculator. And then some ones through nine and zero. One of those keys I believe have two switch contacts under each one and each keyboard can talk to two systems. One of those contacts under one switch is lost its interface with one machine. The easy fix is those switches, those keys, you can individually extract them. The easy fix is to take that that key out, go to the aft keyboard, pull one out of there and put it in, you don't even have to get right one. It will just have the wrong name on it and you just put a piece of tape on it and write on it the location that determines what function it performs. So if its some mechanical failure in the key itself that would fix it, if the problem is not in the key mechanism itself, but in the interface or the wiring from there to the computer box then that won't fix it and you will have to pull the whole electronics assembly out and change out the whole aft box. And we have done that on another flight.

Are we sure its not the DEU?

HUTCHINSON No we're not. And the DEU is the box we were thinking about.

And how about the CRT, it could also be possibly be the tube I guess.

HUTCHINSON Its conceivable. Probably by now they may even know. We'll have to wait to see what they find out but that's the range of things you can get into.

Yes sir, the gentleman from TIME.

JERRY HAMILTON...TIME...Nonfrivolous question sir, will the VORTAC at Truth and Consequences, New Mexico be providing navigational guidance on the downwind to this circling approach?

HUTCHINSON Surely you know that.

I don't know.

HUTCHINSON We can find out for you.

Yes.

Any thing further.

Thank you. We appreciate you coming out. Thank you Hal.

END OF TAPE

p22j CHANGE OF SHIFT BRIEFING 8/28/82

Hello again, and it's time for Neil Hutchinson to do his final change of shift briefing of this mission. Over the last 8 or 9 hours, the crew's asleep at this time and we trust they'll stay asleep until time to get up and prepare to come home tomorrow morning. Neil, why don't you browse over your log there of the last shift.

HUTCHINSON Well, by the fact that I don't have anybody with me, that's indicative of how well we're doing today. No doctors, no systems experts. Everything is cooking along real well. We had a not too busy but successful day and ran through basically our intended flight plan. As you're aware, from Harold Draughon's briefing this morning, we checked out the flight control system and that APU water spray boiler 3 and it worked fine and the operations are going to be normal with that coming in. I had a minor anomaly tonight, which we're not sure exactly what the cause is yet but it will have no effect on us. We were running the last of the 3 payload bay door tests tonight and the door test, by the way, was very successful. We didn't see any gap between the two doors when they were downliked, we thought we might see, after we had been heat soaking the top of the orbiter and cold soaking the underside as we have been and are still doing. Well, we actually stopped just before I came over. During that door closing test, of course, whenever they close the doors, we have to fold the radiators up against the doors and latch them in place so you can get the doors closed and in that process, when we were redeploying the radiators after the doors had been checked for back open, one of the radiators, the one on the port side of the vehicle, drove out slower than we expected it to. It drove out in a time such that we were sure that it only had one motor driving it open. They have redundant motor systems to open those radiators to deploy the radiators. We ran a little test. It turns out that there are some microswitches similar to the ones that we had a little problem with in the payload bay several days ago that are, in this case however, hooked to the drive motors and basically, it's a very simple mechanism. The microswitch is on the latch drive and if it doesn't indicate that the latch is driven open, it won't allow the motor that opens the radiator to drive. Obviously you wouldn't want to drive the radiator open against a closed or latched, against a closed latch. Turns out, we cycled the radiator basically. We closed it up again. It drove closed on two motors. We latched it again and the second time through everything worked exactly normally and we had two motors on the open side, so our only concern there was we wanted to make sure we had two motors on the closed side. You need to be able to close those in order to get the payload bay doors closed, and if we had not have had two motors on the closed side, we were planning on closing it and leaving that one panel on the port side closed tonight. Like I said, it worked all right and there hasn't been any further problem. Quite frankly, that was the only thing in my entire shift today that didn't go right exactly

by the numbers. I'm sure everyone is interested in the weather. The weather tomorrow, and by the way, we ought to, I understand there's a lot of...seem to be some questions about coming in 2 REVS early or 1 REV early. We're getting up, we went to bed an hour early tonight. We're getting up on time tomorrow. We'll be looking at the weather in the morning. The prime landing REV is still 115, REV 115 and I have the data here if anybody wants it. The weather tomorrow looks acceptable. We do have some gusts in the area. We've got that are going to have to be looked at in the morning. We do have a 25,000 foot cirrus deck, let's not call it a deck. It's somewhere between scattered and broken, as expected to be somewhere between scattered and broken and we'll be looking at that again in the morning and rather than me speculate on the weather, I'd just say that our plans right now are to come down on REV 115. We're going to get up in the morning. John Young is at White Sands and is going to fly the STA and take a look at the weather and the wind situation and then we're going to have to play it by ear. We have no plans right now to come in 1 REV early or 2 REVS early. I'll say that for a second or third time because I understand there's some folks thinking we might be going to do that. The weather as we saw it in terms of this wind situation, it doesn't look like it's particularly thermally induced and if we get some wind, we don't think there is a great deal of benefit in trying to hurry up the deorbit preps in the morning and get down 1 REV early. The cloud situation, of course, is just going to have to be evaluated when e get there. We have the option, as we've been telling you for several days, if we don't like it tomorrow, to wait another day and the prognostication for, or forecast for Tuesday is about the same as for tomorrow so I think we're probably going to work real hard to try and get in tomorrow. And the spaceship is great. The crew is great. The private med com tonight was, we actually cancelled the private med com once because it turned up right at the time they had the little problem with the radiator and then we rescheduled it and it was very innocuous. So I think we're ready to come home and that's all I have Terry.

Okay. We're ready for questions. Wait for the mike and identify yourself. Up here, Harry Kingburg.

HARRY KINGBURG...Having been through these landings twice before, how would you compare your state of readiness, both the men and the machinery, this time around as compared to the other two and generally, your readiness?

HUTCHINSON I think everything is certainly a lot calmer than it was on STS-2. I think we were ready on both STS-1 and 2 to come in or we wouldn't have come in. This last couple of days where we have been, I am sure that the crew is more organized than STS-2 was. My recollection on STS-1 is that they were really fairly well organized too. By organized, I mean they've had a chance to really collect their thoughts. The spaceship obviously tonight, we discovered some things that we thought we were going to have to stow tonight had already been stowed this

morning, so their housekeeping, and I think that's a function of having been there for 7 days. I think their housekeeping is just better organized. There were fewer, way fewer teleprinter messages concerned with checklist changes and that kind of thing going up over the last couple of days and almost none tonight. It's going to be an almost nominal night. They're really no modifications to be made. Tomorrow morning, since we ran the APU today, we are not going to run it tomorrow and that whole segment of time called FCS checkout where we went into OPS 8 and checked all the controls and displays and wiggled the flaps and so on is not going to be done tomorrow, which is going to make tomorrow morning even more relaxed than STS-1 and STS-2 were. So I think, of the 3 flights, we clearly are in a more organized state here. Most of it's due to the fact that we haven't had a lot of failures and we've been there longer and the crew has just had a chance to really get their act together the last couple of days as opposed to the STS-2 guys that got up there and had to turn rig...work like the devil, and then turn right around and hurry up and come home with a lot of modifications to their checklist because of the fuel cell being down.

A follow up on that please, and that is having not ever before landed the orbiter at White Sands, can you give us your assessment of the way you feel and the crew feels about that?

HUTCHINSON We feel fine about that. I surely do and I'm sure the crew does and the entry team does. We've practiced it in simulations, landing there and landing at Edwards over and over and over again. The crew probably because of the runway status at Edwards this spring, has more time flying the STA in to White Sands than they do in to Edwards. I'm not sure about that but I'll bet they do. So, it's just not a factor.

Jules Bergman.

JULES BERGMAN...ABC NEWS...Neil, do you think you're getting closer to operational status now with this flight and how do you assess operational status after, with flight 5?

HUTCHINSON Well there isn't any question that, you know yesterday we passed the total amount of time from STS-1 and 2 on the orbiter and we have turned up the fact that the vehicle is not using as much power as we thought and it doesn't get as hot and as cold as we thought, and the systems that we need to make the thing cook along on orbit and get it up and get it back are all working great and we basically finished checking out the arm and it works exactly as advertised and you have to believe that we're a gigantic step closer to having a vehicle that doesn't require as much babysitting, if you want to put it in that state, and that's what the operations thing is all about. It's to be able to put this thing up and back and not have to work at it quite so hard. In STS-5, I am sure that we'll take that one as it comes and certainly nothing has turned up on this flight that

is going, would put any kind of a shadow on that being our first operational flight.

Okay. Back here. Chicago.

JOHN VANN...CHICAGO TRIBUNE...As a kind of an extension of those comments. When you first fly the Challenger, how will your experience from these flights spillover into that. That is will the Challenger start out having to go through the tests, or will that start out operational given what you've learned from the Columbia? Or do you know?

HUTCHINSON I think it'll end up being a kind of a mix. We're not going, there's not another orbital flight test program. We have proved the basic capabilities of the vehicle and certainly there are, you know the first time you take a new car out on the road, there are things you want to pay real close attention to, and I think OV99, or Challenger, is going to require probably some extra effort that first couple of times out to make sure we got it, we understand everything about how that vehicle works and doesn't work. There are some new pieces of equipment, in particular the software on that vehicle. The onboard computing system is better and more sophisiticated and there's more of it, and that's going to take some examination. But in, you know the real answer to your question is, is the flight test...we're trying to build vehicles that are very similar although there are some improvements in 99, and the basic flight test of the concept, and the airframe, and all systems onboard is finished after STS-4 and we certainly won't be going through that again. For example, we won't go through all these thermal things again.

Back over here please.

JAMES WILKINSON...BBC...Can you just briefly outline what remaining development tests you have to go through on STS-4?

HUTCHINSON No James, I can't. I'm not sidestepping you. We do have some more thermal testing to do. The arm testing is basically finished. There are some more orbiter system detail test objectives that have to be done, but quite frankly, I'm not familiar with the STS-4 flight plan. I've been buried in this thing so much that I really am not that familiar with it. By the way I can't imagine that somebody doesn't have...we have an STS-4 flight plan on the straight already and it's available I'm sure yeah, see me tomorrow and I'll show you the flight test objectives. All the DTO's have already been mapped into the flight and there'll probably be some that after we get back the data from this one and look at it we'll want to change up a little bit, but that wasn't a very good answer. I really don't know.

Back up here. Dave Dooling, Huntsville Times. Over here on the isle.

DAVE DOOLING...Given the confidence that you're expressing in the vehicle now and presumably through STS-4, why then will you be carrying the DFI on STS-5 and possibly on 7?

HUTCHINSON That really doesn't have anything to do with the confidence in the vehicle but I think a lot of it has to do with optimum time to take it off and the fact that we're using this vehicle on those flights and it allows us an opportunity to get some more engineering data and you know engineers, we never have enough. But that has absolutely nothing to do with not getting everything absolutely rigorously done in these first 4 flights or the way the vehicle has been adding out in the testing.

Jules.

JULES...Neil, if you were summing up briefly the lessons you've learned from STS-3, what would they be?

HUTCHINSON Gosh, that's a tough question Jules, I haven't thought about it, always hate to answer questions like that, off the cuff. I think that we have a couple of things that we have set out to do, we've really done a good job of, in terms of our basic mode of operating the vehicle and that is we have gotten ourself in a mode where we, on the first day we go up and the day we come down, we've gotten our flight plans and our operations set up so that we really allow the crew a chance to get up there and get organized. The first day's flight plan on this flight was considerably different and not anywhere near as strenuous as it was on 1 and 2. And on 4 it's going to be the same way. And it gives for us a chance to get the vehicle up there and settled down before we really, really get after it. That's one thing, and of course the entry's the same way. We've had a fairly clean ship here, but we're awfully, seem to be awfully compartmentalized and organized to get ready for the come home. Other lessons learned, I don't know. I think we've learned we really don't have to pay much attention to thermal.

JULES What I was getting at specifically, are the failures or the problems you encountered, like heat tiles, cameras, S-band transponders.

HUTCHINSON Well lessons learned on gear that didn't quite do the right thing, you really haven't learned a lesson yet. All you really know about it is it didn't do what you intended and you can rest assured, I'm sure there's going to be a lot of activity on tile. That's something that's going to require, and I have no idea, I mean we may end up having a densify a bunch more tile. I don't know, and I don't think anybody knows at this point. We need to get the vehicle back and it's going to take a bunch of engineering analysis to decide exactly what needs to be done. The things that didn't work right, cameras, and the T.V. system and things like the S-band problems we had. Those are all going to have to be treated, you know we're still not exactly sure what's wrong, if anything with that number 1 transponder. It may not even be the transponder. And that gear has got to be gotten back on the ground, examined, and the failure modes identified. And then some plan of attack to make sure that failure doesn't happen again. If it requires some kind of different design work or whatever. So, lessons learned in terms of things that have broken probably the biggest one is that we can, this ship has capability to sustain a lot of things that don't go exactly right, and it still hums along really well.

Over here.

TONY MALESKY...CBC...How long do your options remain open to decide to stay up longer in the event that you should make that decision? But by the same token, when do you have to decide if you want to come home earlier than you currently planned.

HUTCHINSON I am not intimately familiar with that timeline. But I would guess if we were going to make a crack at an earlier

REV, we would want to do it fairly early in the morning. Shortly after we get up and really get going. I wouldn't guess it to be more than an hour or two. Because there are a nice set of things that have to be gone through to get ready to come down, and we have a timeline all laidout and we like to see things like payload bay doors closed over sights and things like that to verify the vehicle configurations. So, if we decided we were going to do it an hour and a half early. And I'll say it again, we are not waking up early. So that is not an easy thing to do and right now we don't see any advantage in it either. But I would suggest that that kind of decision would have to be made fairly early. Now just the inverse is true on the wave off. I think we could go all the way down to the point of closing the doors and might even go farther than that, and decide that we just didn't like the weather, and I'll try again Tuesday. Now if turns out that we can ever prove to ourselves or convince ourselves that the weather thing is sensitive thermally. That means better real early in the morning and getting progressively worse. By the way, the circumstances we've got now, I don't believe, that that's a consideration at the moment. In fact I'm sure it's not, it wasn't the last weather briefing I got. There is always the possibility that we could go to bed early tomorrow night and then deliberately, you know, just shift the system around and get up early to get in a REV or two earlier on Tuesday. That is something I would consider to be a very feasible thing to do. Tomorrow morning, I really don't think so. I think we'll be coming down when we said we were going to, or not.

Back here.

PETER LARSON...ORLANDO SENTINLE STAR...Two quick questions, one do you have any data on exactly how cold and how hot the ship did get during the various attitudes maneuvers performed during the seven days? And secondly, do you know anymore about why space sickness was such a particular problem on this flight and not on the earlier shuttle flights?

HUTCHINSON Well that second question first. No two humans are alike, I mean that's easy. There's no particular reason for it, other than as you're aware, as we have gone through our manned spaceflight program. We off and on have had those occurances and they happen. So, and I don't think, you know maybe next time this same two guys go and they wouldn't have anything. You know, I'm not sure we understand the physiology of that thing. And each individual's reaction to it well enough to make any kind of prediction based on what we know about them on the ground before they go and so on and so forth. What was the first part of your question?

LARSON How cold

HUTCHINSON How cold, yeah. I don't have any direct numbers. But they're surely available and we've been keeping continuous

plots that on certain temperatures that show that attitude things that we've done. And Terry could get you specific, if you'd like to know it got up to a minus 150 here and plus a 150 here, that data is available. In general they didn't get as hot as we thought they would get. And they didn't get as cold as we thought they would get. And the vehicle's thermal capacitance appears to be much greater than we thought it was. In other words the rate of change of temperatures aren't quite as dramatic. And we very definitely are not requiring the levels of power that we thought we were going to have to have to keep things warm when there supposed to be warm and cool when there supposed to be cool, by quite a bit. A couple of kilowatts worth of power average that we didn't use on this flight. That's why we have so much hydrogen that we thought we were going to have to use premission.

MARK KRAMER...CBS...Neil, what do you see as the most serious problem the mission faced?

HUTCHINSON Oh, I think the tiles. I think that's the one that suprised everybody the most. And it's the one that's going to get the most attention, I suspect. Because we're going to find out, you know the electronics things, they're black boxes and people take them apart and understand exactly what happened. And I'm sure we'll understand exactly what happened with the tiles, but I think that's the one that you'll find in the end is going to end up getting the most attention. Because that really did, did suprise a bunch of people.

KRAMER I'm curious to look at another issue because of the play we in the media gave the story late this week about the transponders. If can quantify in any way on a scale of 1 to 10, 10 being very serious and 1 being very minor. Where does the transponder problem fall?

HUTCHINSON Let me, before I answer that, you know everybody's got their own opinion of that. At the time the thing happened, I think you would have said maybe it was over a five. After we'd looked at for a while, and as I sit here and look at it now. I think it's probably a two or three. And let me see if I can, and I know that's kind of a weazel word, just to give you an example, something I didn't mention that might be worth mentioning. You remember after we got to looking at the situation, people told you that we had a method to use the our recorders to record data and then dump it down. And if we really ever got in trouble and lost all the S-band PM links that we thought we could probably manage the spaceship by recorder dumps. And that's a true statement. Well, guys got to looking at that and believe it or not, we have over in the control center a procedure, we haven't put it onboard, because we don't think it's going to be needed. But if it was needed, we have actually fabricated a cable out of parts that are available onboard. We have a cable kit, for making cables with pins and connectors and all kinds of things. And we have fabricated a cable that connects the input of that

recorder to the output of the recorder and literally just jumpers right around it and will allow us, if we lost all the PM links to connect the telemetry system, the PCM telemetry system, directly to the FM transmitter and get real time data, just as if we'd never lost anything. And we've actually built one, we've hooked it up over here in Sail, and it works like a charm. And it's been going on the last couple of days. And when I came to work today, the procedure was completed. It had been verifed and we had a teleprinter message built ready to send up. Now we didn't send it up and aren't going to. But the point I'm trying to make is that if you just give those kind of things enough time to settle in. Given is an absolute black and white failure that thing looks pretty tough because you look at the percentage of downlink you've lost or may have lost. And I keep saying may because remember that we never really did go back and cycle power on those command encoders that control that system 1 and there are those around that still, and by the way, as soon as we get back on the ground is one of the first things we're going to do. As a matter of fact there is a test procedure that has been put together that we are going to run from Houston via command as soon as the changeout crew gets in there to find out exactly what we have and haven't got in that PM system. But the point I was trying to make about the recorder thing, if you just look at, just let those things sit for a little while, you're really surprised about the number of things you can come up with that allow you alternative means to get something done. That in the end make you feel a lot better about flying around in the configuration you're in.

Final question, dealing with that same issue. Can you characterize how close, NASA Management came to ending the mission early as a result of that failure? Were you very close, very far, or somewhere in the middle?

HUTCHINSON I can't answer that, honestly Mark. And the reason I can't is because I wasn't here that day. You know that failure, the first failure the only hard one we know happened. Happened to be the night, right, just before handover when low power of transponder 2 went. And I went back over to control center, after I got out of here, long enough to see Holloway get on transponder 1 and then I went home and went to bed. I didn't have a shift the next day, and was not. When I got back, everything had kind of settled out. There had been a lot of hoopla amongst you all, but you know it had kind of settled out. So I don't know.

JOHN BISNEY...RKO...Wonder if you could outline for me the crew's activity between wake-up and deorbit burn.

HUTCHINSON Yeah, it is going to follow the flight plan if you've got one, pretty much straight, John. With the exception hat that entire block of time that occurs may be, well we're going to get up, you know and they got some time for getting organized and then breakfast. And then we start working on the

stowage of the vehicle and I think you're going to find the vehicle is awfully well stowed. I have the feeling that it's ready to reenter right now from the scuttle/butt you hear coming down on the air/ground, they seem to really have things pretty ship shape. The one big change tomorrow is that the FCS checkout that was scheduled maybe 3 hours after we got up to about 4 hours after we got up. Is not going to be done, we're not going to take the computers into OPS 8. We won't be checking the dedicated displays or anything. We're just going to go directly from OPS 2 into the entry computer programs. So you know the big thing is to get up and get going. Get the system into OPS 3, then we're going, you know close the payload bay doors, get our suits on, get a snack and come home. It's a pretty straight forward day.

CARLOS BUYERS...HOUSTON CHRONICLE...Neil, is there any particular reason why you were emitting these checks?

HUTCHINSON Yeah, we did them yesterday. Or today, I'm sorry.

CARLOS They've already, I can't feel from reading this schedule that this was something that you kind of went through today, then went through again tomorrow.

HUTCHINSON Well, we had, let me put it this way. The FCS checkout is basically divided into two parts. And one part of it is the part that starts APUs and wiggles surfaces and the other part is the part that checks displays, hand controllers and things like that. And premission, the plan was, we were going to do the part that checks the displays and controls both days. And do the APU stuff on the reentry day. And as you're aware, the reason we changed that plan, was we wanted to make sure we understood the water boiler. We got it all done today, we had no failures at all and so it was just felt that there really isn't any point in doing the display part of it twice, no other reason than that. As a matter of fact, on STS-4, I suspect

End of tape.

NESBITT Good morning and welcome to the final change of shift press briefing for the third shuttle flight and off going flight director Tommy Holloway is with us this morning, and spent the night with his group of flight controllers, updating the plans for today and getting everything ready and I'll turn it over to Tommy and I think he has a little information for you about some of the entry things and a little bit of weather data, maybe. Tommy.

HOLLOWAY Well, I did have but I can't find it. I don't have it, left it over there. Sorry about that. Last night the shift was uneventful. We put the crew to bed on time, they appear to be up for the first pass after they were scheduled to be to bed. We saw no activity after that, we had no alarms. They woke up on time this morning and all is well. The entry is planned for REV 115. Ignition is, in the minutes is 34 minutes instead of what Mr. Hutchinson gave you last evening. So if you'll take the numbers that he gave you and modify the minutes by 30 to 34. What was it 3520 last evening? If you'll change it 34, 5 minutes and 20 seconds, if you'll change the minutes to 34, that's what were using now for planning number. That change was made to improve our capability to down mode from a OMS deorbit burn to a RCS, reaction control system burn, and affect the deorbit. The weather, I had the details, but I got that little piece of paper mixed up with all the other little pieces of paper I carry around, and apparently I left it in the Control Center.

NESBITT We can get that for everybody after the briefing if you like in the newsroom here.

HOLLOWAY The weather is, I can remeber the numbers though, there's 6500 scattered, 12,000 scattered, 25,000 broken, and the winds are 12 gusting to 25. At around the predicted landing time. That's about it, so we'll open it up for questions.

NESBITT Okay, Wayne Dolcefino back over here. If I don't call on you by name, be sure and identify yourself.

DOLCEFINO KTRH Tommy, this talk of gusts of winds between 10 and 12, even before we're supposed to land of up to 30 35 miles per hour. What are the gusts situation, what do we need in terms of constant wind, in terms of our strength, how high can we go?

HOLLOWAY That depends upon whether your gusts are down the runway or crosswind. We wouldn't like gusts greater than 15 to 20 on a crosswind situation. But on down the runway situation, which they'll be able to affect today, 25 or so are okay. And that's about what we're looking at.

WAYNE Something else I was going to ask, so I'll go ahead. Can you kind of talk us through, without getting really

to deep into detail. Can you kind of talk us through some of the highlights of the late morning before we do the ignition for today?

HOLLOWAY Well the crew, the first couple of hours, the crew is going through the normal activities that they do every morning. Get up, get themselves and the spacecraft in shape, have breakfast. And then after that point, they go into the deorbit prep. The first major activity in the deorbit prep was deleted because it was completed yesterday. The FCS checkout was completely done yesterday, and our water boiler checked out very well, so there'll be a little spare time, next. After that, the next major activity is closing the payload bay doors. And that occurs, as I remember around a minus 4 hours. The next major activity after that point is suiting up, both crewmen donning their entry suits. After that comes some configurations, verifing all the switchlists, the vehicles configured the way we want it for entry. And they transition the computing system into the entry programs, in about an hour and 15, 20 minutes to go to retro-fire Then they come over the states and make sure everything is okay, and then we'll have retrofire at 34 minutes on the hour, currently. And that may change a few seconds through the day. And then a normal entry which you are used to, of 400 k, a blackout exit, and so on and so forth. And those numbers are still the same as they were last evening when Mr. Hutchinson talked to you.

DOUG ROSS KPRC You mentioned a change in numbers to optimize the situation or whatever you said for possible RCS deorbit. What is that, just a contingency in case the OMS does not fire?

HOLLOWAY Yes sir. And that's standard operating procedure. I think the numbers Mr. Hutchinson gave you were just done by, without considering that, and it was an over-sight, to be honest with you.

ROSS Okay.

HOLLOWAY And we have always done that on all the shuttle flights to date.

NESBITT Okay, back over here, the gentleman in the blue shirt.

ACKERMAN TIMES LONDON Is there any possibility that you may bring the shuttle down an orbit earlier? If so, when will that determination be made? And also, if the gusts come around to 90 degrees to the shuttle, and you decide to keep it up, when will that determination be made?

HOLLOWAY Well, the first question, currently we don't intent to land a REV earlier. Ideally, if you wanted to land a REV

early, you should have started yesterday. Put the crew to bed an hour and a half early and woke them up an hour and a half early, and all would be relatively the same this morning, except we'd be seeing an hour and a half early landing. There's still an opportunity to affect an hour and a half early by deleting some activities, some measurements we take associated with the payload bay doors and some nonessential activities that already been identified in a deorbit prep. That option probably exists under normal circumstances up to about the time we close the payload bay doors at a minus 4 hours. After that point, it would take and emergency situation to, for us to want to deorbit early. As far as how late you can delay and go tomorrow, if that was the third question. Technically, you can delay right up to ignition time and decide you're not going to go and wave off, and we'd put a plan in effect to spend another 24 hours or 22 and half hours and deorbit preps an orbit early tomorrow. So, technically, we can wave off and go a day later right into tig. Was that all your questions?

NESBITT Right in front there.

DICK RATNER ABC Could you do an anomoly check please? What's happened with the S-band, what's happened with the CRT that was a problem, was it changed, was just a key changed? What ever happened to that Florida fly?

HOLLOWAY Well let me take those in back. I have no idea what happened to the Florida Fly, I imagined he got smooshed somewhere. (Laughter)

HOLLOWAY I think Jack, that he hasn't seen him for a couple of days. But who knows what happened to the Florida fly. Obviously, he's not flying around in the spacecraft, because we haven't heard the crew say anything about it. The second question on the CRT, we have a spec key that calls a specialist function, that is certain kinds of displays out of the computer. That display failed on one of the keyboards, yesterday and that key has been replaced with another key, off of the aft keyboard that is not normally used, acknowledge key that is routinely not used very much. And a little repair business, we call it In-flight maintenance. They took the key out of the, the fail key out and replaced it with a nonused key from the aft keyboard. So the guys upfront, both have functional systems, complete functional systems. And the fail key in the back, there's no key in the back in the place where this one came out of is, the fact that we don't have it is of no consequences. Your first question about the status of the communications systems, it's the same as it's been for the last 2 or 3 days, after the initial failures. And rather than try and summarize that, I'll refer you to the previous hand over briefing.

RAINER I'll follow that up, who's keyboard had the key failure and who changed it.

HOLLOWAY I don't know who actually did the work. I didn't ask, and I believe it was commanders left keyboard, the one that normally the commander uses.

NESBITT Right here next to him.

HOLLOWAY And someone might be able to find out if they reported which one changed it. They may not have even told us which one changed it.

(Garbled), FRANCE PRESS Could you tell us what that keyboard does in the aft cabin, what's its usage in the aft cabin?

HOLLOWAY Well, anything the crew wants to do while they're in the aft flight station. A typical activity would be closing the payload bay doors, looking out the window, one guy over on the left side where the keyboard is at, the other guy looking out the window and doing the work.

FRANCE PRESS REP Is that used for the arm as well? That one?

HOLLOWAY Yes.

FRANCE PRESS REP And they have a CRT on that keyboard as well too?

HOLLOWAY Yes. In the same area. And again, I'll emphasise that that keyboard is totally functioned as far as its purpose, a keyboard has multiple keys on it to perform different functions. It has all letters and it has all of the digits, 1 through 0 and 1 through 10, or 0 through 9, and there's some keys on the keyboard are not,... perform functions that not required, absolutely required and we use one of those keys to replace one up front and so you ought to consider the aft keyboard as being a completely functional keyboard at this point.

FRANCE PRESS REP In any event, it's not utilized during reentry, or anything.

HOLLOWAY No sir. Not at all.

NESBITT Back over here with Doug Ross.

DOUG ROSS Following Mr. Ackerman's question just a little bit. Now John Young's going to take off I believe at 8:00 o'clock in the STA and make an assessment of the wind conditions and the possibilities for landing. Now from what you've said about the difficulty of coming early and the ease with going late. Would you say that if a waveoff is determined or if they

.ink the winds are going to be too high at the intended landing time, they would probably go another day rather than try to come home a REV early.

HOLLOWAY Well relative to the work that the STA is going to do. It can only do it at particular times and if it said it was okay at a time phasing that would allow you to deorbit early, it would have no of determining it's going to be bad at a later time. So as far as the STA work is concerned, it could only be used to determine that you were in a situation that would very undesirable to land in and the management might and the patentiary flight director might at that point just decide to wave off for a day. But basically if the STA determines that the landing conditions are difficult and we determine that that's not a safe situation we will have the capability to wave off and go another day.

ROSS I guess what I'm getting at is odds are that you would,...if there were...if you weren't going to land on the scheduled time, odds are you would go long rather than come short.

HOLLOWAY With respect to the STA work, that's absolutely right. If we wanted to decide and land the orbit early, it needs ' ' be done in the next 2 to 2-1/2 hours and that will be based .....would have to be based on weather predictions, and not actual information from the STA and I don't expect, personally expect that's going to happen, although, I would imagine at about this very time, the entry flight control team is receiving a weather briefing and it's possible that they might decide to try to de-orbit early but I don't really believe they will.

NESBITT Okay. We'll take one more here and then we'll go to KSC and if necessary, we'll come back here for questions right here.

PAUL RAYBURN AP If you go long, is it possible you'd long for a REV or 2 or would it be 24 hours?

HOLLOWAY Well it's possible that we could wait 1 REV, up to 1 REV and based on changing conditions elect to deorbit on a plus 1 REV situation, very possible.

NESBITT Okay. Let's go to KSC for questions and we'll come back here to JSC if necessary for others.

NESBITT Did we lose those folks?

NESBITT Do we have any questions.

No. We're not getting the questions.

HOLLOWAY Well. We're not the only ones that's having complications.

PAO Okay. If we have any more questions here, we'll go ahead and take those for a minute while we get squared away at KSC. Yeah, right over here.

JOHN PINE REUTERS Your're talking about the weather problem, but as it stands now, it's coming at approximately 12:30, a little before 12:30 Mountain Standard Time? There's no doubt about that?

HOLLOWAY Right on time today.

JOHN PINE Right on time. Thank you.

HOLLOWAY I'm going to go home, set my clock and wake up in just in time to see it.

NESBITT Okay. Now we'll try KSC again. Do you have any questions there?

MARK MAYFAIR UPI Tommy, you may have just answered my question, but in your own feeling, do you think they're going to land today and land on time?

HOLLOWAY Yes sir.

MAYFAIR How about the weather. Would you classify the weather right now good, bad, fair?

HOLLOWAY Well, I would classify the weather fair with the situation...I would like for them not to be so gusty but the weather to be fair and acceptable assuming that it doesn't deteriate any more than we expect it to.

MAYFAIR Okay. Thank you.

NESBITT Okay. That's all the questions from KSC. We can come back here. I do have a weather report that came out of, apparently out of White Sands this morning, no this is the last night's weather report, so I think the things we have here is a little more up to date. This generally described a headwinds for the prime runway 17 and winds to be 5 to 10 knots with gusts to 15 but I think...is that about what we heard for for...

HOLLOWAY ...Gusts a little higher than that.

NESBITT Yeah. I was thinking we had gusts to 25 perhaps.

NESBITT Okay. One more question in the back. Mr. Ackerman.

ACKERMAN Mr. Holloway, these gusts of 12 to 25 your describing, are these head on to the proposed landing direction of the shuttle and second question, what's the pattern out there for weather where you get this gusting situation at this point, what are we likely to be looking at? 1:27, whatever.

HOLLOWAY Well, those are predictions for 1:27. They're not the winds...the winds right now, I believe, are less than that and the gusts are a lot less and the gusts tend to build as a function of time in the daytime. We have two runways at Northrup and the entry flight director will be making a decision on which runway to use to take advantage of being lined up with the wind the way he wants to be and generally he'll...once he decides that the winds are such that...of a large enough magnitude that he's unwilling to do the intentional crosswind landing where we'd like to land with winds of 10 to 15 knots. Once he exceeds that and decides that he's going to do the best he can on the wind, he'll pick the runway that gives him the best margins in terms of winds and take the runway that puts the winds down the runway.

ACKERMAN Okay. I understand that one of the prime objectives of this landing has been to get a crosswind landing. We'll have the wind a beam. If that doesn't look like occurring, would he bring it down or would he rather go till tomorrow to effect that test?

HOLLOWAY We would not go until tomorrow to effect the test. If we have acceptable landing conditions at any runway we'll deorbit today.

ACKERMAN Thank you.

NESBITT Okay. If we have no further questions, we'll call this one over and thanks for coming out today.

END OF TAPE

PAO Ok, we're ready to start now, we have with us this evening Mr. Gene Kranz who's Deputy Director of Flight Operations. We'll open this session with an opening statement by Mr. Kranz, and then we'll throw it to questions.

GENE KRANZ Ok, let me tell you basically, I'm sitting in for Harold Draughon here this time. Principally because we're going to be doing a relatively short turnaround and Harold's team got office replaced by Neil's team, we'll even bring in Tommy's for a short period of time, just try to keep the teams fresh. Basically, the entry team will be onboard again around 1:00 this evening local time. Let me briefly summarize the planning process as it has occurred in the Control Center over the last several hours, and rather than trying to copy down all these numbers, I'll leave a copy of the sheet here that I think PAO can reproduce and the only thing I can't signify is to the authenticity of is the local time. Because when I try to convert to Eastern, Central, Mountain, Pacific, that kind of stuff...I think it might be worth while to recheck a few of those numbers. But all the MET times, and everything else as far as I know is correct on here. In looking at the opportunities for tomorrow, remember the last time we talked here I think, or the last time I had the opportunity, it did indicate that from the standpoint of weather, we're going to have to play the weather real-time. In fact I said we may consider coming down 24 hours earlier or even going 24 hours late from the standpoint of deorbit. And that's pretty much the posture we find ourselves in right now. I think you're all aware that the weather out at Northrup strip today was unsuitable. We pressed it right up to the very end, when I say pressed, we're in a safe posture all the time and basically our wave off time is generally the last pass over the Continental United States prior to the deorbit maneuver. In a similar fashion, we use the Shuttle Training Aircraft in the same fashion that we had used for the previous missions. Because no matter how good the forecasters are, what you're really after is a crewman who is aware of the handling qualities of deorbit or whose flown the entry and can provide you an on the spot evaluation as close to your time for the deorbit maneuver as possible. In fact we continue the STA flying after the deorbit maneuver just in case we'd be faced with for instance, a change in runway direction, which is possible. So basically, we exercise the same procedures that we exercised in STS-2, and will exercise these procedures for foreseeable missions. Whenever we feel we have a weather difficulty, such as the one we had today. Now let me briefly go into the planning, and I'll give you a bit of the rationale behind it. As soon as we had waved off, we starting taking look at landing opportunities tomorrow at all three landing sites, Northrup, KSC, and Edwards. And we had some early morning opportunites that we had looked at, and basically we scrubbed the orbit 128 opportunity, principally because we wanted to again, get the STA up and perform the same type of evaluation that we performed

today. In addition, we got, we had to watch out for how much further backward we'd have to change the crew sleep time to allow them to get adequate time for sleep in the evening. At the same time, we couldn't put them to bed too early, because we still have some orbiter cleanup to get ready for this upcoming sleep period. So basically, we found ourselves in a posture, or a basically scrubbed out on the orbit 128 opportunities. Our basic planning now has a crew activity plan and all these numbers are preliminary, they're good within about 30 minutes I'd say at this stage right now. But, we'll get the crew to bed roughly around 6:00 this evening, possibly even a bit earlier. And again the times I'm talking here are central standard. And we're getting up the crew about 2:00 a.m. central standard tomorrow morning. In all cases for all deorbit opportunities we'll exercise the same basic timeline and it's the same deorbit prep that you saw today less two items. We've eliminated the flight control system checkout and basically that was basically pad in today's deorbit prep, and at the same time we've eliminated the theodolite measurements on the payload bay doors. So, basically those two items will not appear in the timeline. All the remainder of the timeline items and the sequence is basically as we had established at pre-mission, as we exercised it today. The deorbit opportunities that we'll be exercising, and again this basic timeline, getting up at 2:00 in the morning, and basically running for a 7 hour deorbit prep, puts us in a posture where we could deorbit to Northrup strip on orbit 129 with a landing at Northrup around 9:07, that is mountain standard time. In a similar fashion, depending upon how clear the weather decision is early tomorrow morning we will have targeting available, that could allow us to deorbit into KSC on that same orbit for a landing at 11:13, eastern standard time. Again, we would exercise this decision process, again looking at the weather, as we had today. Also taking into account such things as winds aloft, how it's going to affect the entry guidance, the crew status, I expect to be excellent, the spacecraft systems status will be excellent, and I expect that the recovery capabilities at Northrup strip as well as KSC will certainly be suitable. So basically, on orbit 129 our primary targeting will be for Northrup, again, with a relatively clear cut weather decision, and the weather in a totally satisfactory fashion, that's more than likely where we would go. However, if we find out we're faced with the same type problems that we had today, we have the option to go into KSC. On orbit 130, we would be planning that, more less as a backup in case we normally would wave off from the Northrup deorbit opportunity. We would plan in going the next rev or orbit 130 into KSC, landing times there would be 12:47 local. The pre-deorbit and post-deorbit tracking for both orbit 129 and 130 are basically the same, we've got good communications coverage, good tracking, for those opportunites. All of those opportunities are within our, what we consider acceptable cross-range limits. We also have backup opportunities continuing throughout the day at both Edwards and Northrup strip. Now the weather status is going to continue to change throughout the evening into early morning. And, I think the basic feeling of

the flight control team is that the weather outlook for Northrup for Tuesday and even Wednesday is not particularly good. Now there has been some discussion about the possibility of a high developing off southern California, and we're going to have to watch that throughout the nighttime period. KSC weather, with very high confidence, is good. Tomorrow, however, it's possible that the weather could be deteriorating on Wednesday. At Edwards the winds are forecast to be high, and we have the possibility of a tail wind on the approach and landing phase. So basically, I think that the opportunities into Northrup, we're going to have to watch very closely. The KSC opportunity looks very good tomorrow. I don't know if there's anything else, just a couple of other notes from a standpoint of consumables, we're in excellent shape from a standpoint of consumables. We've got between 72 and 96 hours, depends upon how we track...72 hours that we could continue at the power levels we're at right now, we're still at 24 hour reserve beyond that. So basically, for those of you who are familiar with mission rules and redlines, the redline basically accounts for some of the uncertainties in the measurements and a 24 hour wave off capability. Well, we have 72 hours of consumables above that redline at the current time. We have no spacecraft systems problems at in any way right now that would compromise using this flight duration if it became necessary, but I don't expect it will be necessary. That's basically it.

PAO Ok, we're ready now for questions, please wait for the mike, raise your hand and if I don't identify you give your name and affiliation, Roy Neil.

ROY NEIL (NBC) Gene, can you give us what you think would be your optimum choice, in other words, what are you really looking for, what would make you the happiest in mission control, and about when do you think that weather will solidify well enough for you to be able to project which site you're going to land at?

KRANZ Well the optimum choice would certainly be the choice that we had exercised premission, and that's basically to utilize the Northrup strip facility. The lakebed capability out there because again, this is our third flight, we've got several fight test maneuvers, and we'd like to have, as I think you're all familiar, a pretty good margin about anything we do early in the program. So, basically I believe the primary choice would certainly be Northrup. However, I consider either KSC or Edwards fully acceptable. We have to be prepared for such things as the RTLS capabilities, a lot of the AOA training we've done to go into a runway, all of our contingency sites during course of the mission or to a runway. So basically, we would reduce our margins slightly by going into runway, but I would consider it perfectly safe. Second part of your question talked about the timeline for decision, and again, the basic times that I've quoted here are basically central standard times. We expect a weather observation update from Northrup strip, roughly around 3 to 4:00 this coming morning. The flight control team intends to

get together with the program management, and the weather personnel, somwhere around 5:00 in the morning. Basically, we're baselining our first look, first look, at the weather at 5:00 a.m. central standard time. My preference would be if it's clear cut, we're going, saying in to Northrup or we're waiving off Northrup, to make a decision by 6 if possible, because to make it easier on the crew I'd like to make this decision part of suit donning, so if we're going to slip an orbit, they can make that decision, they won't have to don the suits any earlier in the timeline than is normally called for. However, if necessary we can go right up to just as we did today, the last stateside pass prior to the ignition time to deorbit to Northrup and wave off. So, basically our basic timeline that we would exercise is very similar to that which we exercised today. We will have, and we are in the process of moving an STA aircraft to KSC, so we can get the same observation and services from KSC as we get from Northrup strip.

NEIL Could I just follow through? Am I reading you correctly Gene, what you're really saying is your going to try for Northrup first time around on rev 129, then if that fails and the weather starts to deteriorate there you are going to seriously start looking at KSC?

KRANZ Yes sir.

NEIL I'm reading you correctly?

KRANZ Yes sir. We'll look at Northrup and its not only the short term, we also have to take a look at how we handle this vehicle after we roll out. What is going to be the weather there, but the principal concern is obviously to have the greatest margin possible, this early in the program and basically we would use crew safety as the principal discussion, I mean the principal element of the decision process, but again I don't consider unsafe to go to the runway. Just provides me a little bit more margin.

Pat Dolen, Cable News Network

PAT DOLEN... CABLE NEWS NETWORK..How high could the winds at White Sands get before you would be forced to scrub the landing again?

KRANZ Well the principal concern today, it's a question of when the orientation along the runway in the crosswind component. The principal reason for scrubbing today was more associated with obscuration because the winds had finally swung to the point where they were just about down the runway. So I would say one of the primary reasons for the scrub was just the obscuration, the other one was there was significant turbulance in the area and these two prameters were the ones that you can't readily evaluate from forecast, which is why we have the STA airbornes, so it was a combination of winds, but todays scrub was

more the obscuration of limitations and visibility and the turbulance that the STA crew encountered. I think you heard his recommendation, we had pretty much come toward the same conclusion in the control center also.

Jules Bergman.

JULES BERGMAN...ABC NEWS...Gene would you reach a clean cut decision at 6:00 a.m. or 6:30 a.m. or would you wait until John Young and the STA aircraft had flown, to do so?

KRANZ Well let me give you for example, I'll cite a (garbled) case. Suppose this wind kept blowing all night long, and people out at Northrup strip had indicated they had all kinds of duning out there and they just didn't have a chance to clear it, that's an obvious choice and a wave off choice. If we get into a situation like today, I doubt if we're going to be able to make it by six, I think we're going to wait til the STA is airborne and again that is one of the reasons why we didn't consider that earlier opportunity we had. Just so we could get the STA up to do the kind of job it did today. There is a possiblility of a clear cut decision early, but unfortunately it never seems to work out that way, it always, you keep working so right down to the very end.

JULES BERGMAN...Second question. Are you happy with the 300 foot wide runway at KSC? In case there's a crosswind blowing or isn't it true that you and the rest of the controllers, control team would like to have a crosswind landing under your belt's before going there.

KRANZ Yes we've always wanted a crosswind landing under our belt. We've established on STS-2, 3 and hopefully in 4 as a relatively high priority objective. We placed this above the other ladden objective but to some extent we consider it replaceable. We're going to try to get either one or the other. Again I believe its a common feeling that while we would like to have it, that the spacecraft is reasonably capable of being handled, in fact I think its a rather solid machine to handle in a crosswind, I think what we're interested in is getting some experience in the rollout aspects. From the standpoint of the runway width, I think we've got full confidence in our ability to maintain directional control of this vehicle, we've got the brakes, we've got rudder to some extent, but also we've got the nose wheel strings. I don't think we are particularly worried about the rollout, again its a question we would like to have as much margin as possible as early in the program.

Dave Dooley, Huntsville Times.

DAVE DOOLEY...HUNTSVILLE TIMES...How close did you actually get to firing today and what will the crew be doing with most of the

'me they have today? Will it be just standing back and then
.suming?

KRANZ Actually if I remember, we were about 50 minutes, in fact we were less than that, I would say we were about 35 minutes. At that time we were in the process, I personally and I think several of the people there had recognized that we were going to wave off. So my principal concern, recognizing the relatively short period of time we had was to get the cycle of planning started so we could have something to say right now. I'd be inclined to say we were within about 20 to 25 minutes of deorbit take, but again, we play it pretty close to the best when we are playing with weather. We had talked about it if you remember over the states and we had made up our minds that we were going to have a clear cut decision over Ascension, and that's basically what we did.

DOOLEY And the crew time?

KRANZ Crew time right now, basically if you have been listening to the air to ground, we have been in the process of reconfiguring the spacecraft, we going to be giving them a little bit of free time but we're going to get them to bed about one hour from now, because again we had to further adjust the sleep period to get them up around two in the morning.

Morton Dean CBS News.

MORTON DEAN...CBS NEWS...Gene someone suggested earlier today that there might be a problem in the buildup of loose sand on the runway at Northrup. Is this a problem, do you have to sweep it clean, or what?

KRANZ Yes, there were some indication and it would probably be better to let Northrup folks talk for themselves, I'm sure they're not tagged into this, but one of the discussions that we had with George Page, just shortly ago, was basically there was some indications they may be getting some duning on the end of the runway and yes they expect the winds to taper off tonight and they expect if the winds drop down by around 10:00 this evening, that they will be able to go out and more or less take a look at the surface conditions and do whatever clean up is necesary.

Al Sehlstedt, Baltimore Sun.

AL SEHLSTEDT...BALTIMORE SUN...What about the people Mr. Kranz, do you have enough technicians and people with experience to handle the equipment at KSC or are you going to have to move some of them, fly them over from Northrup or just what are your procedures there and the second part to that question briefly, en you refer to Edwards as an alternative field, you're speaking of the hardstrip there, I take it?

That is correct, we are talking about the runway at Edwards. I don't have the specific answer to your question about the availability of crews at KSC, I'll get you this after we finish this conference but again in the discussion with George Page, he indicated that he believed they could handle it down there and other than that generalization, I could get you more details if necessary.

Carlos Byars, Houston Cronicle.

CARLOS BYARS...HOUSTON CRONICLE...This morning immediately after making his comment that they have time to bring this to a halt, John Young commented that the turbulance was very, very bad, in fact I believe he said that it had popped something loose he had never seen that before. Could you tell us a little bit about that?

KRANZ Basically there a certain set of flight conditions that are set up principally for safety of the G2 airframe. That's what they call SIM disengage and there's a variety of conditions that can cause the STA simulation of the orbiter to disengage and there is a large variety of conditions under which that will happen. He basically saw what he called a SIM disengage.

PAUL RESER ASSOCIATED PRESS If you land at KSC are you going to have to sacrifice some of the aeronautical engineering tests that you're going to perform on the way in?

GENE KRANZ I really don't know. We haven't taken a look at the entire phasing of the entry process. I don't believe that we would compromise too many of the aerodynamic maneuvers that are planned. And one of the advantages of KSC is we've got microwave landing systems in both ends of the runway. So I think we certainly continue to pursue that objective as planned, but the details to that lev[illegible] the specific elements I'd say in general yes we intend to accomplish the planned entry maneuvers and to try to satisfy the autoland objectives but we're going to have to take a look at that overnight.

MERV CHAPMAN ABC RADIO First a clarification and then a question. Because it's somewhat different than we think we were told earlier. The opportunity on rev 130. Are you not going to land at Northrup but only at Kennedy if you go to 130 and second, the question, since there was a lot of speculation the last three days about landing 1 rev early at Northrup and an hour and a half before the schedule landing John Young found conditions acceptable. Are you now kicking yourselves that you didn't?

GENE KRANZ No I'm not. And I'll answer that last question first. I think John Young did the same thing we as flight controllers do. What he wanted to do was to make his final observation at the last possible opportunity. He knew the basic process for preparation for deorbit. He knew that the basic plan allowed a waveoff within that last rev prior to deorbit and again, he was playing it close to the vest just like we try to do in other areas of the control center. So no we're not kicking ourselves in that area. I forgot, the first question was the one associated with the deorbit on orbit 130. Two Northrup strip. The reason I didn't include that that opportunity always exists but the basic indications we have for tomorrow is that the winds the gusts the turbulence will be less early in the morning than it will be as it progresses through the day. So our basic planning we could go either way but our basic planning tends to feel and basic indications are if it isn't good early in the morning it isn't going to get any better.

ERIC INGBERG CBS What kinds of changes would be required in positioning the spacecraft for TIG if you go to Kennedy?

GENE KRANZ Basically it's principally adjustment and I'll give them to you relatively. For instance, if we want to move from Northrup to Kennedy we delay our ignition by about 6 minutes. Excuse me, about, yes about 6 minutes. That is the principal adjustment we make.

CRAIG CORVALT AVIATION WEEK Gene two questions. First on crossrange, discuss the crossrange you have to pick up on rev

129 and 130 and how that affects the initial bank and the subsequent roll reversals and I have a second question too.

GENE KRANZ Craig, we really haven't, I have the numbers on crossrange that are on this sheet. I have crossrange left and right of the groundtrack on there. There's a note when I give it to you that will indicate whether we are left or right of the groundtrack. We haven't really taken a look at all the phasing of the maneuvers. We're going to have to take into account the winds at that time to set up what our initial phasing will be. We haven't done that yet.

CRAIG CORVALT Okay, and second, is on a contingency landing into KSC would you expect Jack to go control stick steering all the way around the hack and all the way down. I think you spoke really to that a minute ago on autoland.

GENE KRANZ No I think that that's really dependent upon the winds that you have at that time and basically that gets into how we approach the hack for various KSC approaches, but again I believe that we would try to stay with the autoland as long as we could.

MAX RUSELY THE GALVESTON NEWS If they go into KSC tomorrow and everything goes fine would they possibly just start going in there beginning with the next flight rather than flight 5?

GENE KRANZ That's an interesting question. I think that certainly is a possibility. Again, what we would have to do is take a look at what kind of margins did we maintain, how far down the runway did we touchdown in a lot of those parameters. I think again the whole question of landing sites and I think this brings up a point that might be worth considering not only for this mission but for subsequent missions. The reason we got the consumables is because we managed them such that we had weather options. I believe weather options are going to be with us for a considerable period of time in this program. And in our flight planning I think in the future we're going to be looking very heavily at considering mission duration to satisfy the flight objectives but keeping an open end from the stand point of being able to pick the best possible weather. Our preference will always be I think to go into KSC.

Let's take 2 more questions from Houston and then go to the Kennedy Space Center. The gentleman with Agency French Press.

LUCY NAME FRENCH PRESS Mr. Kranz do you consider this perhaps a blessing in disguise that it proved to you the flexibility of your planning and of different landing sites that you can move it any place you want really?

GENE KRANZ I think that's a good question. To some extent I'd say yes. I think that there's few surprises that I've had in the

program that have been very worthwhile, very beneficial. I think in the flight 1 if you remember we had basically what amounts to as a perfect flight. I mean spacecraft, no anomalies, nothing like that. Flight 2 we had a bit of conservatives bit of conservatism in that flight but again we continued to satisfy the basic flight objectives in spite of a power plant failure, basically the fuel cell failure the second mission we were flying. This flight here I think we're starting to see the overall maturity of and our confidence building in the spacecraft. We've developed several work arounds, we discussed communications here awhile back. I don't know if you may have heard we've already got a jumper worked out if necessary that we could exercise onboard to provide us real time data over the FM transmitter. I think we've got significant amount of maturity and confidence in the flight control teams. The planning process I mean we've juggled it back and forth several times during the course of the mission. To my knowledge we've satisfied 100 percent of the principal objectives that we had. Yea, I almost do consider it a blessing. I'd like to be on the ground right now because I think a lot of people are getting tired but again I think we've got the confidence that with no risk to the crew or the spacecraft we can continue until we get a more acceptable landing situation. And that's sort of a judgement process we went through.

JIMMY WALKER ABC NEWS A couple of question. What is the first consumable that will run out? When will that occur?

GENE KRANZ It's hydrogen right now and as I stated we've got a 72 hour margin above our redline so we have approximately 96 hours of hydrogen remaining in the spacecraft.

JIMMY WALKER And you talked about the greatest margin of safety being at Northrup. Could you compare in that context Northrup versus Kennedy?

GENE KRANZ That's very difficult to do. Because what you have to do is you have to equate the landing conditions all things being equal. Perfect weather at both sites. We have slightly increased the margin of safety out at Northrup strip for such things as, assume we'd blow a tire. Remember what we're trying to do is to find a cross, we wanted to satisfy the crosswind landing which was brought up earlier. We've got margins for various minor failures that could occur that could cause you know small perturbations in directional control of the crew. Now again we believe that the crew can control the vehicle in case of a blown tire but we won't have any problems there. From a standpoint of energy margins, we always we want to get a few more flights under our belt prior to the time we go into a runway landing because we have to be very close in management of the energy. But again, our experience has been for STS-1 and 2 that the flight systems have performed exceedingly well and we really didn't need that margin. We've got several flight test maneuvers. We've got the autoland that we're attempting to

satisfy in STS-3. We'd like to have maybe just a little bit more margin there. I don't consider it unsafe it's just it is good technique in a flight test program to have that added margin if it is available. Right now we may not have that availability and in no way do I consider that we're unsafe.

PAO Okay, we'll go to the Kennedy Space Center now for questions and we'll return to Houston for a few final questions.

ROBINSON CHANNEL 2 Could you elaborate on the main factors that would necessitate a landing here at KSC and how much time would you actually save in turnaround time if you land here?

GENE KRANZ I'd say the principle factor that could cause us to move into KSC and I'm not leaving Edwards out, but again I think our basic thought processes if you got to go to one runway you might as well go into the facility down at KSC. But again, we are going to look across both KSC and Edwards tomorrow and select that site which we feel is going to provide us the greatest margin. From a standpoint of the fact that it could put us into KSC just assuming that was our next best place to go. I believe a weather situation very similar to today, the fact that possibly they couldn't clear the runways in time for our planned deorbit time. Those are the type well what I'd say is contingencies. Those are the type problems that could cause us to waveoff. Now is there another question there please?

ROBINSON Turn around time?

GENE KRANZ Turnaround time. I can't speak specifically to that one, I'd guess that would be in the order of 7 days to 2 weeks but don't quote me on that one. I'd suggest you contact the KSC personnel.

LYNN MARSHAL In the event that the weather is not acceptable at Northrup, Kennedy, or Edwards which site would you go to after that?

GENE KRANZ If it was not acceptable we'd keep flying. No, basically the the basic theme it looks like KSC is going to be excellent tomorrow and that's why during a good portion of the discussion that I've had I tend to look at KSC as our next prime site. The weather there looks like it's going to be quite good.

JERRY LIPMAN Specifically what individual will decide when and where the ship lands, you, James Beggs, whom?

GENE KRANZ I believe that's a composite of several individuals. You have the program management and the people on site at each one of the facilities providing you their status. You have weather observations from each of those sites. You have the input from the crew flying the STA, John Young, he's had

STS-1 flight experience and as you are aware he made the call today. You've got the airborne crew. And the airborne crew has to some extent already expressed their opinion that if they have to go to a runway it's their preference and their belief that KSC might be the place to go. But basically, there's several individuals who all contribute to this decision process and generally Dr. Kraft and Glenn Lunney working with the other program managers will make the decisions.

JOAN HELLER TODAY I assume that you've spoken to the astronauts about all the different possibilities. What do they say?

GENE KRANZ No we haven't. They may have by now. They gave them a sort of oan earlier indication, early in the day, probably about 2 hours ago. We just finished the preliminary look at the timeline. Neil Hutchinson's team, the Orbit team was in the process of getting the crew put to bed and I just fed them various thoughts that had come up in the basic timeline we were working to just prior to the time I came up here, so I can't vouch that they have given them all of the thought processes that have occurred so far. It will be prior to the time they go to sleep however.

REGGIE TURNHILL BBC It sounds as if you need an astronaut with flight experience to be flying over KSC tomorrow. Have you arranged that?

GENE KRANZ Yes. We're moving a STA to KSC and to my knowledge right now I think Dick Truly may be flying that one. But I'll check on that one after this conference also.

JERRY LIPMAN To follow up on Lynn Marshall's question. Will you consider an overseas landing at all if all the, no? ok.

GENE KRANZ I don't see any advantage in an overseas landing. We have much better tracking, much better communications, much better navigation aids and with the period of time that we could still continue to fly this time I'm sure we could find a set of weather conditions that was appropriate for landing.

TOM BOYLE CONSERVATIVE PUBLISHING COMPANY, TIPTAN, IOWA What would the groundtrack be on these two approaches to Kennedy?

GENE KRANZ That's probably about the one piece of information I didn't bring. But I'll get a copy of it and provide it to my knowledge it'll go just about clean across the United States from west to east and the approach azmith should be pretty close to I imagine about 90 degrees into the heading alignment circle at KSC, but I'll check that.

PAO We have one more question.

LARRY CALTHUR ST. PETERSBURG INDEPENDENT If all factors are equal the weather is perfect at Northrup and perfect at KSC would

vou say now that the tendency would be to land at Northrup?

GENE KRANZ Yes.

PAO We do have one other question.

JERRY LIPMAN Everybody on the telephones this afternoon here said you folks in Houston would have information on chase planes if the landing is here. Can you tell us how many, where they'd fly from, the patterns, pilots, that sort of thing?

GENE KRANZ No, but I know Dick Truly was working on that late this afternoon and I have not had a chance to tag up with him. I've been worrying the timeline deorbit opportunities that type stuff, but again we'll get that information for you.

PAO Sounds like the kind of thing we can get overnight.

GENE KRANZ I just wondered, do we have somebody who takes notes of all these actions I got here so that I don't miss any.

PAO Okay, let's switch back to Houston now, the gentleman with the London Times.

PEERS ACKERMAN London Times Let me get this straight Mr. Kranz. What I understand is, if you go down to the wire and you get a wave off at Northup then KSC is, you're 90%, 99% choice then.

KRANZ That's about the size of it, that's it.

ACKERMAN Thank you.

KRANZ Yeah, basically the key thing is if we wait right to the very last minute, to wave off to Northup, it is doubtful, in fact I'm almost sure we would not try KSC on the same orbit. We would slip, we would go in 1 orbit later.

ACKERMAN Wouldn't consider staying on that 130, it would go straight through.

KRANZ Again, what we're gonna have to take a look at the weather and establish priority sights tomorrow, but KSC looks pretty doggone good.

Okay, I just copied a report from the control center that Bob Crippen will be flying the STA at Kennedy tomorrow.

KRANZ One action closed.

JULES BERGMAN ABC News Gene, if both White Sands and KSC look unfavorable tomorrow, would you try Edwards, or would you press on till Wednesday?

KRANZ That'd be a pretty tough decision. I think it would depend on the winds out at Edwards, whether we're picking up a tail wind as we were going in. There has been some limited concern about the approach, considering the fact that the lake bed is not particularly good to use as an overrun right now.

BERGMAN I' talking about the concrete runway at Edwards.

KRANZ Yeah, what I'm talking about though is again considering such things as overrun and for the tailwind case I'd think there would have to be some consideration towards the winds in that area and how the heck we could approach it. But I believe the basic intent would be, we don't want to paint ourselves in to a corner. Okay, we've now, as I stated, we've got plenty of consumables, what we have to do is take a look at the long-term weather forecast and see if we were absolutely beyond a shadow of a doubt, sure that we were gonna have landing weather suitable the following day before we'd wave off Edwards. So I think that is a possibility that I think has to be

considered, and again I can't forejudge what the weather's gonna ...

BERGMAN And the second question. Will the MLS at the Cape, can the MLS at the Cape, fly the Shuttle down to the runway hands off?

KRANZ Basically, the basic intend if you remember, was to pick up CSS in the preflare time frame, and again I think that's still our basic intent. I wouldn't see any reason for changing that particular set of flight objectives. We'd like to again approach the, again going back to margins we discussed earlier, we'd like to ease into getting this type of flight experience, and I believe we'd continue to pursue the auto-land objective just as we'd planned premission.

PETER LARSON Orlando Sentinel Star Two quick questions. If the weather's not substantially better tomorrow, what would you say are the odds of landing at KSC, and secondly, what is the greatest risk of landing at KSC?

KRANZ I think to indulge in the first one would be pure speculation trying to outguess the weather, cause we thought it wasn't gonna be as bad as it was today. In fact, it'd probably be best not to speculate that. I think the chances are, well the fact is that KSC weather looks like it's gonna be good. Northup weather looks like it has several of the same characteristics we saw today with the possible exception that a high may be developing in the Gulf of California area and push some of that stuff north. Best decision there is to wait till about 4 in the morning or 5 when we take a look at it and see how it goes. I think the greatest risk of landing at KSC, I don't see any risk as substantial, because again as I stated earlier, I believe the navigation performance has been excellent. I think the crew's ability to land this aircraft with relatively low sink rates, and have good directional control during the rollout process, has been demonstrated to be good. If there is one concern I'd have, it would be landing either short or long. But I think it would be principally the short landing case. I don't consider that a reasonable probability, however.

PAUL REISER AP Two questions. Do you anticipate, or are you planning to powerdown some systems or take further actions that would further conserve your consumables, that's one.

KRANZ Okay, the first question is, we've already powered down, we're very close to around 11 kilowatts load and that's what we're basing it on. We've got DFI off, we've got a good portion of the OSS packages off, I don't expect any further power down because I don't want to deviate, we're gonna be powering up here in roughly about 8 hours and I don't want any major deviations in the checklist. I just don't want to put the crew through that kind of trauma, and we have a healthy margin right now.

CIER Second question is, how much in your management process, how much weight did you put on the observations of John Young today. In other words, if there had been conflict of opinion, which way would it have gone, and the second part of that is, have you got someone making similar observations at Edwards tomorrow along with Northup and KSC.

KRANZ We'll work out procedures. Our principal concern since we considered the KSC weather as what you'd say is better, or more favorable tomorrow, we decided to move in that direction, we haven't established, to my knowledge yet, specific plans for weather observations at Edwards. The basic decision process, I think that the people in the control center arrived at the same conclusion John did, just about the same time. I think everyone had been watching it quite closely, the weather decisions were definitely continuing to worsen throughout the day. I think the basic process was a combination of Dr. Kraft's, John Young's and the flight directors.

REED COLLINS CBS Radio About crew training, at the relative sites, it's always been said they've had more practice landings at White Sands then any place else. What about the practice at KSC, they've had alot of return to launch site abort practice, have they had alot of normal approach, east to west, or west to east?

KRANZ To my knowledge, this particular crew has possibly spent more time in the STA on approaches at KSC then they have out at DRFC. The second point is, immediately prior to launch, once we knew we were going in Northup, and the lakebed was wet, we set about to run several integrated training runs, both stand-alone as well as integrated, with the crew into KSC. So, they're not unfamiliar with the approach, approach geometry, and some of the characteristics of KSC as a landing site.

JOHN BISNEY RKO I'm just wondering if the importance of looking for an opportunity to do a crosswind landing has diminished at all in importance in comparison with just getting the craft down properly.

KRANZ We're still continuing to pursue the crosswind landing, but again if you remember the mission rules, it was a question of autoland and crosswind. The crosswind had the higher priority, but my gut feeling is, we'll take whichever one we can get, principally to get the experience. We're satisfying one of our principal objectives, either way we go. At KSC I think there's reasonable probability we would see a crosswind.

MARK KRAMER CBS Gene, there were reports this morning that the weather was significantly better at White Sands earlier in the [illegible], and you made a remark in this conference to that affect, that the weather seems to be better earlier than it is later. The other day, I think it was yesterday, Mr. Hutchinson made a

remark which was diametrically opposed to that. He said in response to a question about coming back one rev early. Well, we don't see any advantage in the weather in coming back earlier in the day, as opposed to later in the day. Which is it?

KRANZ Well, that's very interesting, because White Sands, there is a statistical weather that basically indicates that the winds tend to build up more in the afternoon in the month of March, and if I remember right, for about three days in a row, it was the opposite, out at White Sands. And I believe that's probably what Neil was basing, and it's just a question that you have statistical weather and then you have what actually happened the day before and the day before that and we sort of play our own Kentucky windage in that. Interestingly enough today, the forecast wind difference between one rev prior to the time we were scheduled to deorbit and the deorbit rev was only about 5 knots difference.

CARLOS BYARS Chronicle Couple of questions. First, a moment ago that you commented that some of the people were getting tired, and I'm wondering whether you're referring to people in the control center or to the crew, or all of the above? Secondly, on the west to east path, what kind of affects do you expect to have from the sonic boom?

KRANZ I haven't looked at that, and we haven't mapped out the sonic boom yet, I'm sure that will be a consideration this evening as we get into more detailed planning. From a standpoint of the people getting tired, I think the crew is in excellent shape. We've gone to lengths in the last couple evenings and again this evening to make sure they get a good 8 hours sleep. They seem to be sleeping well, I think the control teams are pretty good in managing the system so that we don't have any unnecessary alarms that we might wake them up. I believe the basic concern I've got, and it is a concern of significance yet, is that we've done several, what we call whifferdills, in the flight control team, we've ended up, as a result of moving day 4 up to day 3 and moved the team around, and then we decided we'd make some changes in day 5. It's just been a constant period of juggling of the shifts, and we thought that we had finally gotten back into the right cycle day before yesterday, and now we're in the process of turning around the entry team in a short cycle. But again, the controllers are exercised this type process, and they've got a good sound team structure, they've got a good handover process. It's one thing to be tired, it's another thing though to walk into that control room knowing you're gonna deorbit this day, you got these activities to do and boy the adrenaline get's going and you don't know you're tired until 3 hours after splashdown.

KRANZ Splashdown, wrong term, rollout (laughter).

We've been advised by the control center that JSC will provide one chase aircraft to the Kennedy Space Center, and

the pilot is a gentleman named Guy Gardener. He's an astronaut, and in the back seat will be astronaut Jerry Ross.

PAO Let's take about two more questions, then close it.

STEVE MCVICOR National Public Radio You may have already gone over this, but do you have equal amount of recovery equipment at both White Sands and KSC?

KRANZ Yes, KSC is obviously our ultimate landing site for the majority of the landings in the program, and yes they do have all the necessary equipment there to support the vehicle landing and turnaround.

MICK CONNOR Reuters In simplified terms, you will deorbit on 129 at White Sands and 130 at KSC?

KRANZ That is correct, and let me make sure everybody understands that. The numbers I give are deorbit revs and the landing is the orbit orbits, and the landing is the subsequent orbit. So, when I say we deorbit on 129 we actually land on orbit 130. Basically, when you see this sheet of paper here which might be useful to you, basically, the orbits that are listed there are the orbits for deorbit. The landing will be on the subsequent orbit.

PAO Okay, this is next to the last question. I guess we're gonna have a change of shift briefing at about 8:30 so we need to close this. Morton Dean.

MORTON DEAN Gene, on the track to Kennedy Space Center, you're going across land almost the whole way, for Edwards it's over ocean for most of the way, if there's an emergency onboard do you have additional plans for this flight track whereby the commander would take the ship out to sea and so that it would ditch there, or do you have different types of emergency procedures because it's going over land most of the way.

KRANZ No we do not in a specific sense. But I think like any pilot in a high performance airplane, I believe that they have the concern of the public, the ground track, the safety of the people that they fly over very well in their minds, and assuming they had controllability and knew they weren't gonna make the landing site, I'm sure they'd put the spacecraft in a posture where it would result in minimum damage to the local areas and avoidance of hazards to the population. That's pretty much standard.

JIMMY WALKER ABC Gene, to go back to your comments earlier about landing short or long at Kennedy. On the first space shuttle flight, Columbia landed 2800 feet beyond the planned touchdown point. On the second, it was 1000 feet before. Is there anything in this instance, should you land at Kennedy that you can do to assure pinpoint landing?

KRANZ No, basically either of those cases would have been acceptable. If you remember we actually target down the runway we've got an underrun as well as an overrun. And to my knowledge if the crew really got on the brakes they could stop in, if I remember right, it's around 7500 to 8000 feet. I think we've got a healthy margin from a standpoint of vehicle capibility for braking, and actually that's why the runways are as long as they are, to just provide that again margin that we like.

PAO Okay, thank you very much. We'll see you at about 8:30 with flight director Neil Hutchinson.

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