

Only 65p

# Commodore

November 1984

HORIZONS

## SPOTLIGHT ON PLUS/4 AND C16

### 64 SPEAKS OUT

Current speech  
synthesiser tells off

### HALLEY'S COMET

Win an Astral telescope  
from Dixons

### JOYSTICK CONTROL

How to use joysticks  
in your programs

Tony Crowther  
presents  
**LOKO**



WIN £250 of s/w from  
Creative Sparks

Special  
Special  
Special £7.95 per  
computer screen  
including 2  
screens

AT LAST ... SUPERIOR SOFTWARE  
FOR THE COMMODORE 64 COMPUTER

COMMODORE  
**64**



**PERCY PENGUIN £7.95**

**Special**



Many of our titles are available in Books, WH Smith, John Menzies, Funkebooks, Little's, CUP, HMV, Greengate, Dabovision and Spectrum Shops. Also at all major computer dealers - Citic Computers, Micro Management, East Coast Personal Computers, Minotaur, Eurocomputers, 3D Computers, Computervisio, GPM Computers, etc. Our software is also available through all the major distributors, and directly from us by mail order.



**CHES**  
**£7.95**



**DRUGHTS**  
**£7.95**

**WE PAY UP TO 30% ROYALTIES FOR HIGH QUALITY COMMODORE 64 PROGRAMS**



**SUPERIOR SOFTWARE LTD.**  
Dept. CH, Regent House,  
Skinner Lane, Leeds 7  
Tel 0532 450453



**DISCLAIMERS**

- 1. Most software is not 100% before use software
- 2. Most software is copyrighted by the author before release
- 3. In the unlikely event that we do not have software for your system please contact us for details of our software - 1st edition - 1984

**Editor**  
 Brandon Cook

**Assistant Editor**  
 Christopher Jenkins

**Editorial Secretary**  
 Geraldine Smith

**Group Advertising Manager**  
 David Lutz

**Advertising Manager**  
 Nancy Saxe

**Administration**  
 Theresa Lutz

**Managing Editor**  
 Duncan Scott

**Publishing Director**  
 Jerry Ireland

**Telephone Number**  
 (all departments)  
 01 497 4543

**UK address**  
 Commodore Horizons, 12 1/2 Little  
 Newport Street, London WC2R 1JD

**US address**  
 Commodore Horizons, c/o Business  
 Press International, 202 East 43rd  
 Street, New York, NY 10017

**Subscriptions**  
 UK: £4.95 for 12 issues (includes surface  
 postage) US and Canada: \$14.00 for 12  
 issues, US and Canada airmail  
 \$20.00 for 12 issues



**Subscribing with us**

Commodore Horizons welcomes readers' contributions — either articles or program listings. Articles should be typed, double spaced, with a wide margin. Program details, whenever possible, fit printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return every article or program submitted, so please bring a copy. If you want to have your program returned you must include an a/c.



Commodore Horizons is published monthly by Sunbeam Books, Sun Press Ltd, Typset by In Step Ltd, 15-16 Dalglouga Street, Levenshulme, EC1. Printed by Sunbeam Press Ltd, Thames Valley University, Sun, distributed by SMI Distribution, 14-15 Tavistock Gardens, London WC9P 6PR. Tel: 01 461 1111, telex: 200875, ISSN: 0261-0846. Registered at the Post Office as a magazine.

© Sunbeam Books, 1984

## CONTENTS

<b>Reviews</b>	<b>7</b>	<b>John Gals</b>	<b>11</b>
More on the battery problem of Palopart and the latest speeds in the chequered career of Computer Path.		The best recent reviews — it's over — the video, graphics and music players.	
<b>News</b>	<b>8</b>	<b>David Poynter</b>	<b>12</b>
Medical keyboard, Don Darr joins Virgin, new address and all the latest software.		Chris Whelan's strange attempt to have the records of machine code with Dr Watson.	
<b>Buy a Machine</b>	<b>13</b>	<b>John Gals</b>	<b>41</b>
Commodore's new machine announced by Keith Bevan and John Cochrane — is it a rival to the 64, or can it compete at a 60c market?		Tepp Crowther, author of Poly Piggy, produces a basic game for the 64 — LOAD.	
<b>CB Reviews</b>	<b>14</b>	<b>John Gals</b>	<b>46</b>
		Kevin Bynon takes a look at RAM Discs — come! look! black! too!	
The Vix 20's successor, the C16, announced by Andy Parnall — if the Vix is dead, can the 16 take its place as an introductory machine?		<b>David Poynter</b>	<b>52</b>
<b>CB Links</b>	<b>20</b>	<b>Software File</b>	<b>54</b>
16-year-old Steve Costen explains some basic programming concepts — also, reports, the DATA statement and how to use the BASIC graphics option.		More listings from readers — the monthly, a two-part article spec for the 64 and more.	
<b>Articles</b>	<b>26</b>	<b>Reviews</b>	<b>60</b>
Chris Bevan talks to Tony Crowther, arguably the country's most talented game programmer. That's why we asked him to write a game for us in this issue!		A look at the latest books on Commodore computing and a giant book of Vix games.	
<b>David's Querying</b>	<b>29</b>	<b>David Cochrane</b>	<b>62</b>
Frank Bynon's program helps you make sense how your 64 can be made to respond to various control.		A special extra comparison — we try some unusual software from Denver's.	
		<b>David Lutz</b>	<b>67</b>
		Gabriel Jack Cohen takes another crack at your technical problems.	
		<b>David Poynter</b>	<b>74</b>
		John the Mail Pile regular and we Dargat Moon from Creative Sparks.	

## EDITORIAL

COMMODORE'S TWO new machines, the Plus/4 and Plus/16, have been a long time coming. Originally announced at the CES show in Las Vegas in January, the new machines finally made their public debut in the UK at the Commodore show in June, though they were not available for sale until September.

The C16 is designed as a direct replacement for the long-serving VIC20, production of which has now ceased. With 128K RAM and 128K ROM, the C16 offers more memory than the Vic at the same price of £139.99. With enhanced graphics and sound capabilities, the C16 looks set to consolidate Commodore's presence in the low-end games market.

But, the Plus/4 is not aimed as a direct replacement for the now-popular 64, though comparisons will undoubtedly be drawn between the two machines. The Plus/4's main distinguishing feature, in the same respect, is the scale of four integrated software packages — a word processor, spreadsheet, database and page printer. Applications, rather than games, provide the key area.

However, the Plus/4 integrated software has not met with universal acclaim. Admittedly, the four programs all reside in memory at the same time and have the ability to exchange information, but their scope appears to be limited. The spreadsheet can display information as a bar chart, but not as a pie chart. The word-processor lacks right justification.

The Commodore 64 will undoubtedly continue to sell in quantity well into next year, as will the new C16. Sales of the Plus/4 may be more problematical.

What must be worrying Commodore, however, is the question "what comes next?" By the middle of 1985 the venerable 64 will be entering to show its age. Will Commodore attempt to replace it with a new machine, or will consumers be left to choose between the more limited C16 or the applications-based Plus/4? And, to help Commodore in its quest as related to the problem, Alan's deadline may be starting to show larger by April year.



For the price of ten aliens you can  
communicate with far friendlier





Imagine the benefits of being able to communicate with other computer users. Of letting your computer save money on new software as well as helping improve your programming skills.

And wouldn't you be better informed if your computer kept you up to date with new developments in the computer world?

Just a few of the ways in which our Modem helps a Commodore 64 become more useful to you.

#### Fitted in seconds.

Our Modem is as easy to fit as it is to use. One end slots into your Commodore 64's cartridge port, the other plugs into your telephone line.\*

#### Computer Pals.

Once you've installed a Modem you can communicate with all other Commodore 64 Modem owners.

You can leave messages on bulletin boards, sell and swap programs.

You could work together on programs. Discuss recent software releases. And even play chess.

Now you see it.

You'll be able to see page after page of information from existing systems like Prestel, Macrotel\* and the exciting new system called Compuserf.

CompuNet, it's new and unique.

At present CompuNet's exclusively for Commodore 64 Modem owners.

It's the most advanced communications system designed for home computer users.

At last you can work hand-in-hand with a giant mainframe.

Because you can send and receive information.

This increased interactivity brings the capacity of large computers into your home.

#### Software galore.

And a lot of it's free. Free games, free education, free information.

Free from bulletin boards.

Because you can now select software from CompuNet direct over it on to cassette or disk.

What's more, highly priced software from leading companies is on offer, thanks to our Modem's built-in security systems.

You'll also be able to pick up useful hints and tips to improve programming skills.



#### Free tuition.

Now your computer can make a serious contribution to your children's education.

Already CompuNet has over 50 free educational packages, with subjects ranging from elementary maths to A-level Physics. And there's up to 10 new packages every month.

#### Our Modem delivers the goods.

You can already shop via CompuNet and make great savings by joining Compu-Card.

Before long, you will be able to view new property lists, order groceries, organise your banking, and even request insurance quotes.

All in addition to a wide range of services currently available through other systems.

#### Free for all.

If you order a Modem now you will receive one year's free subscription to CompuNet.

Representing a saving of £10.

Add to this the reductions you can get on many purchases through CompuNet and you can see the obvious value of owning a Modem.

#### What price the world at your fingertips?

A Modem costs much the same as 10 others.

Or to be precise £99.99.

Which is money well spent, because a Modem continually revitalises your computer. Making the Commodore 64 a home computer that should never lose its appeal.

You may find our Modems in the shops, if you're very quick.

Alternatively you can avoid disappointment and buy direct from Commodore. Simply complete the coupon, then we'll send you a Modem, plus your year's free subscription to CompuNet.



Commodore Communications Modem,  
1 Hunters Road, Wotton, Cotsw,  
Northamptonshire NN2 7QX



Please send me a Commodore 64 Communications Modem plus a year's free subscription to CompuNet (worth £10)

I am enclosing a cheque/postal order for £99.99 (incl. VAT and P&P) (made payable to Visions)   
I would like my Visa/Access card debited

No.

Signature

Or please send me further information

Name/Mr/Ms/Miss

Address

Post Code

Supplies subject to CompuNet stock and availability. Allow 4 weeks for delivery. Free to Commodore Communications Modem, 1 Hunters Road, Wotton, Cotsw, Northamptonshire NN2 7QX.

can now  
er beings.

Go for it with Hyper Biker.....real barm warfare

NEW  
RELEASE  
AVAILABLE  
SOON

Now you can experience all the thrills, spills and spills of BMX racing without leaving your comfortable keyboard. Play on your own or with up to 3 friends to beat each other and the qualifying times set by the computer. There are 8 different events but you must qualify on each to move on to the next. Trick features include table tops, wheelie da doos, ramps, speed bumps, ditches and drop offs.

You have complete control of your pedals, handlebars and bushes so that you can pump, wheelie and really perform. But go easy on you'll end up eating dirt.

# HYPER BIKER

Available on Cassette £7.95

FRONT HOP



SPEED JUMP



WHEELIE



SMALL



EVENTS  
1 Straight Race 2 Obstacle Race 3 Wheelie  
& Jump Jump 4 High Jump 5 Bumpy Hop



## LETTERS PAGE

### Poke poke

HERE ARE a few useful  
troubled POKES to try out  
on the untroubled by 20.  
Some may be useful or  
included in programs  
POKE 505555 — key repeat  
POKE 60004 — fills key  
repeat  
POKE 761234 — fills  
RUN/STOP key  
POKE 610101 — sets SAVE  
function

POKE 1010 — Clears  
key board buffer  
POKE 500000 — kills  
RUN/STOP / REVERSE  
POKE 517610 — kills  
RUN/STOP key  
POKE 510555 POKE 47110  
— sets LOAD  
PW A company  
Columbus  
Sussex

### peeee again...

WITH REGARDS to Sweet  
Powell's quiz on  
Pobegs

The problem is solved by  
"Excessively yes", and about  
your percentage you will find  
a list which will solve your  
problem. As one good com-

puterer another, could any  
of your readers help me with  
regards to the same Quiz?  
I cannot get past the screen  
outside the laptop door of  
the house without hearing  
something first.

I am lost for words.  
The machine is a superb,  
informative and interesting  
read, keep up the good work.  
How about an Adventure  
Center for the adventure  
fans?  
John Wood  
Water Management  
Went

### Basic error

I REED your Pokes as  
described in the August  
edition of the magazine for  
moving the location of Basic  
up on the 128K4 drive with  
Basic Pokes. I found in the  
Manual that, you either RUN  
or MEM produced a  
SYNTAX ERROR message.

On inspection of the Basic  
RAM without the Pokes, I  
discovered that address 200  
contained zero. I thought  
Pobek was one the first  
address of the disk, was after  
moving the location of Basic  
up with your Pokes, then  
loaded in the Basic program  
and the SYNTAX ERROR  
message was no longer  
produced.

I can only think that if the  
first few number of a  
program isn't contained in  
1 byte the first byte of the  
Basic area is not zero filled.

has stopped over. I don't  
have a ROM permanently, so  
I cannot check the accuracy  
of this guess.

I wish you find this  
information useful and  
perhaps you it on to the  
Manual if this is still having  
problems.  
Steve McCrack,  
Mansel  
Went

### Chart toppers

AS DISCUSSED by Ben  
Aronowitch and Don Labin,  
could you include a chart of  
the bestselling Commodore  
games in your excellent  
magazine?

Also, could you sponsor a  
high score game in  
"scoreboard"? It's great to  
bring the scores... 200001 on  
Savage of the Nations  
I score, 116200 on Rock  
Head  
Jan Davern  
Essexville  
Mid Cheshire  
CAN anyone beat these  
scores?

### Kuhn Lin conquered

I HAVE just read Peter  
Cassard's article on the US  
Gold game Rock Head in  
September's Horizon. I see  
that he did not succeed in  
developing the system of  
Kuhn Lin.

We obviously haven't  
performed enough! I went with  
ground corners, the result  
being that the majority cannot  
blow apart and a whole Big  
explosion at the top wing.  
Steve Williams  
Dorset  
Went

### ...and again!

ON Pobegs the computer  
might very well hold the  
secret to cross the road!  
Clear. Try being very "Look  
out for Mothers!"  
C.P.B.  
Dorset

### Mastertronic

MASTERTRONIC has asked  
to print out that there is  
no connection between our  
Star Letter for October 1985.  
Based by John Gray of Solar  
Software and the  
Mastertronic game of the  
same name. Our apologies for  
unintentionally misquoting  
Mastertronic's title.

While it's an excellent  
model, it isn't too hard trying  
to type in Tony Eastbrook's  
Secret Number — the  
"22286-29" as late 1984 is a  
guess and should be ignored.

This is the chance to set  
your stars — send  
your tips, compliments  
and congratulations to  
Letters Page,  
Compendium Horizons,  
10-12 Little Newport  
Street, London  
WC2E 8LN



## Modem mania mounts

WITH COMMODORE'S Compact Modem officially launched at the PCW show last month, several other companies have entered the modem market.

Poco's 1200 modem is a standard RS232 device costing £29.95. An interface cable costing £4.95 is needed for use with the 64. The software is available on 5.25-inch floppy disks for £10.95/£10.95 or £10.95/£10.95. Personal and the subsidiary Miramax services can be accessed using the modem, but the question of downloading software and accessing Compuserve has not yet been resolved.

Contact: Coda Holdings, Park Lane, Bournemouth, Hants, BH9 3AA (01424).

Meanwhile Theta EMU (Europe) has announced the VModem modem, initially for Apple and IBM computers, but with versions for home users to follow. Contact: The Sales Dept, Beta Computer Sales Group, Theta EMU (Europe), Spar Road, Fiddian, Midwinton, G1 4RQ (0475).

Lastly, Sanyo's 2084/V31 modem for the 64 or Vc 20 is a 280 baud device supplied with software enabling the user to be used as a "dumb" terminal. The unit is not compatible with Personal, and does not have Telexnet support. Cost: £149.95. Contact: Sanyo, Ltd, C2, Pudding Industrial Estate, 11-15, Cresswell, London W10, tel. 01 449 1942.



Profile: 2084 modem

# 64 music — the key of life

MUSICAL 64 users will be pleased to see the release of a clip-on mechanical keyboard overlay for the machine. Commodore's Music Maker software £29.95. The system will include the keyboard, which can cover the top two rows of QWERTY keys, keyboard stickers, cassette or disk software, and a music book.

Further software and book releases are planned. The book programme will allow sound systems using most of the features of the 64P chip, programming of rhythms and melodies, and operational functions.

Music Maker will be available at the end of October, and we plan to carry a full review

in next month's issue.

A Commodore spokesman at the PCW show spoke of the possibilities of further 64 music developments which might allow connections of the music to other users, such as remote users and drum machines using the MIDI standard, though no firm details could be given at the stage.



Music Maker — clip-on keyboard with range of software

## Quicksilver attack

QUICKSILVER launched a marketing campaign for the 124 Christmas game machine on September 13, with a press conference attended by game designers Steve and Charlie and Dr Hawkins.

The Mighty Thing, also known as up to version 2000 AD, was due to receive the launch of Operation Big and the Quick Silver Jetpack Alpha, the Streetwise Big, in a series of twenty-fourer focused in regular sales from 2000 AD. The 64 game, one of a projected series, will cost £7.95.

J-B Box Attack, which has sold 50,000 copies in its Spectrum version, has now been adapted for the 64. It features a revolutionary 3D-based perspective graphics system, depicting a maze which you have to explore in order to test your belief of how attacking gets with your eyes will be £7.95.

Contact: J-B from the Birmingham Advertisement team,

and is a strategy-based game in which you have to locate the defences of a castle — £7.95 again.

Magic Mirror Machine is one game in our based on the opening credits of the Council TV series. In the first game you start laid on an alien planet presented by robots and in the

second you must penetrate the Magic Mirror in order not to appear in its incredible mirror £7.95 again.

Disk-based software includes Designer of Be and Castle of Justice. Both games, costing £12.95 are real time interactive board adventures in which the hero, Hercules the Warrior, is drawn deeper into the myths of the story as the game proceeds. The games are supported from Accelerated Software of Canada.

Finally, an art writing program offering either contact or keyboard, costs £14.95.

Finally, start's Summer Games, from Eggs UK, an Olympic simulation which simulates the graphics capabilities of the 64 in the home. Set the game on a QWERTY for a full review.

Reviews of the other games will follow soon.

Contact: Quicksilver at 13 Fulsham Road Southampton.



Designer — EJ Atamp Alpha



# Virgin Games — who dares wins

VIRGIN Games will release a program based on cartoon hero *Star Wars* in the spring of next year.

The program is intended for the Commodore 64, as well as the Amstrad and MSX machines.

Das Dars, space-pilot hero of the English comic, has recently become fashionable all over again with the release of *Empire* by IPC and the re-releasing

of many of Dars's early adventures in book form by Dragon's Blood Press.

The Virgin game will probably be a multi-screen arcade adventure done in comic-book style, with speech bubbles. As the program is still not available in its final price (at least of the game), but negotiations for copyrights have been completed. More details will be made available soon.

# Practicorp thinks ahead

PRACTICORP, producer of the PS Programmable Spreadsheet and 64 Double programs awarded in previous issues, has announced plans for its next batch of releases.

The new programs include business and educational packages. *PractiFile* is an adaptation from a successful Windows-prior version. *Secretary 64* and *PractiCalc 2* are also on the way, and on the

educational games front there's *64 Pak*, *Top Tutor*, *Zypper's Encoder* and *Spine Typer*. Total Health records like a version of *64 Doctor* designed for human beings.

Full details of price and availability will be released shortly. Practicorp can now be contacted at Goldoad Road, Whitehouse Industrial Estate, Ipswich, Suffolk, IP1 3NP, phone 0473-46271.



Practicorp's full lineup

## RS232 access eased

ACCESS Computer Co. of Basingstoke has developed a standard Serial interface and cable, allowing connection of RS232 printers to Commodore computers.

The RS232 unit is supplied with simple instructions and allows the Epson 8300, FX80 and FX 100 printers to be used, along with many other models including Star, Showa, OKI, Brother EP74, and Silver Reed printers.

Contact The Computer Centre, 61 Shaw Heath, Stockport, Cheshire, 061-477 6011.



Access interface

# Hugh's artistic winner

THE RESULTS of Commodore's International Art Competition was announced at a show at the Hayward Gallery on September 5.

The winner of the competition, which required artists to create a self-representative work of art on a 640 x 360, was Hugh Ray of Manchester. Hugh was a 15-year-old student in study computer art at the country of his choice, plus £1000 worth of Commodore computer equipment.

The winning piece was a study of Hugh's baby son entitled "Love" (Medicine Picture 1207).

Prizes were also given age group and category including Evan Williams of Newcastle, Richard Halliday of Hendry de Thame, Cassie Ross of Aberdeen and Janice Delaney of Blackpool.



Hugh Ray and his winning program



# Stay cool. Stay low. Stay alive.



## RIVER RAID

1-0 Flyers, flying on  
Commissioned 1st Squadron, 1st  
Fighter Wing, 1st Air Force,  
from your usual software store.

You are commanding a squadron of four ground attack aircraft.

The mission is seemingly hopeless.

Fly along the river at zero altitude, twisting and turning quickly to stay within its tortuous banks, blasting at anything and everything in sight. Especially the bridge.

Three of your jets are held in reserve while you are pitched against Battleships, Enemy Aircraft, Land Tanks, Balloons, Helicopter Gunships. All intent only on your destruction.

And destroy you they will, if you don't get them first. You'll need to keep an eye on your fuel gauge. But take comfort, you can take fuel on board from one of the special depots.

If you get hit—and nobody has yet reached the end of the river—your next reserve starts at the last bridge you blasted on your way through!

Each target you destroy adds to your points score.

Like all Activision Software, River Raid will hold you and keep you coming back for more.

Chocks away!

Lose yourself in the world of

 **ACTIVISION**



# Plus/4 — the verdict!

COMMODORE's new 64K machine is sure-making an entrance to the home market where its predecessor has been so successful. So, how does it compare to the 64?

The first thing that strikes you about the Plus/4 is the case — an rather the lack of it. Instead of the rather cumbersome rounded box inherited from the VIC-20, the Plus/4 features a much smaller and more MSX-style wedge-shaped design, which is far more visually attractive and places the keyboard closer to the desk top. The top section of the top provides ribbed ventilation fins and the unit recessed and unobtrusively.

The appearance of the white keyboard is rather similar to that on the portable 6264, but the key tops are considerably dulled. It may not be quite as acceptable in some ways as the 64's, as the keys are heavily spring-loaded and rather "bumpy", but such features are rather a matter of personal taste. It is departure from Commodore tradition: the cursor keys are placed away from the main keyboard in a distinct location at the bottom right corner of the case, which makes cursor control much easier. Four dual-purpose FUNCTION KEYS are placed in a horizontal row at the top left of the keyboard.

## Warm start

A power on light and switch are provided, together with a RESET button. The RESET key normally acts in the same way as the power switch, giving a straight

forward cold start, but if the RUN STOP key is pressed during RESET a warm start to the machine mode instead is made instead so you can often reinsert programs which "hang up". We feel that this feature should really have been reserved for a warm start by pressing the RESET key alone, as it is rather too easy to accidentally produce an unwanted cold start.

All the I/O connections are placed neatly along the back of the machine. The SERIAL (for disk drives and printers), VIDEO (for monitors), and TV sockets are identical to those on the 64, but the coaxial port, user port, and joystick ports are all slightly different, using small 5-pin plugs. These socket changes are mirrored in the standard COM cassette records and joystick cables, which are plugged in. The power supply is the familiar "lump" provided with

the 64, but with a different connector. An interesting addition to the row of sockets is a MEMORY EXPANSION port, promising even greater storage capacity, but there is no separate cartridge port and no cartridge are incompatible, as the connector differs. As usual on Commodore machines, the usual 5V0 does not use the industry standard 5V00 voltage levels (an interface will be required for non-Commodore peripherals, and communications).

## Memory switching

On power up "COMMODORE BASIC V2 64001 65105 PROM" appears at the top of the screen. The screen number is a reflection of the improvements made to the BASIC (since the 64's 12 and the 6001) bytes of memory directly available through BASIC is a whole 27768 bytes (214) more than the (revised "highwater") on the 64. Although both machines have 64K of RAM the increase in availability is achieved by some fast automatic memory switching routines (and we can't wait to see if Commodore's TV ad's will now feature a like whole).

The Plus/4 retains the full screen editing facilities of the 64 but adds more word's control, such as automatic wrap and back key characters, and the editor is easy to operate with the new cursor key arrangement. In usual Commodore fashion a result of different graphic characters are printed on the lines of the keys but there are not obviously re-definable.



To keep up with the business WINDOW facility has been included, although this is either rudimentary, providing only a single window on ESCAPE sequences. The top right and bottom left corners of the window must be defined in terms of current cursor position, so including window settings in programs is rather messy. Other ESC facilities include automatic error detection of a whole line, turn-off scrolling, refresh screen display (which may be necessary on some TVs), and scroll up and down.

The default settings of the function keys provide some form of "GRAPHIC" (F1), "DIRECTORY" (F2), "SEARCH" (F3), "DELETE" (F4), "RUN" (F5), "LIST" (F6) and "HELP" (F7) and as regards to the context on the 64 the function keys can easily be redefined using the KEY command. The useful HELP facility assists in debugging BASIC programs. If an error comes to light during execution then pressing HELP displays the appropriate line with the statement underlined in flashing characters. However LIST and then calling for HELP will freeze the error to context.

### Slow loading

The first manual suggests that the context routines are similar to those of the 64, so we expect that it may still suffer the same problem of slow loading.

The PLUS4 operation perfectly with the 1241 Disk Drive, but inevitably a return from the notoriously slow screen base of the 64. The 1241 is to be replaced by the 1243 which promises faster execution times. The commands supplied on the 1241 demo diskette (ie the 64) are not retained on the PLUS4, as the disk handling commands are all included in the ROM. These disk commands comprise DELETE, ERASE, DIRECTORY, BACKUP, COPY, COLLECT, RENAME, SORTACH and HEADR. With 1243 provided to meet



one-disk handling errors.

BASIC V1.3 is a marked improvement on the first old BASIC V1, as Commodore has taken to heart the numerous complaints from users and included many of the better features of more modern BASIC. All commands available on the 64 are included together with a number of significant additions. Commands can be abbreviated and of course you can program the function keys to duplicate any desired sequence.

The extra new program and screen commands are as follows: AUTO provides automatic line numbering while DELETE removes program lines on screen. Although Commodore has not gone the whole hog and provided a completely structured BASIC, the addition of DO/LOOP/WHILE/UNTIL/EXIT should give long way towards opening the doors. BASIC 1.3 supports IF THEN ELSE rather than just the simple IF THEN which makes for better programming. Mod-Pascal to RETURN now allows a line number to be specified from which to read DATA. Extensive error-trapping routines are included to make user programs easier to write. TRAP traps all error conditions under "UNDEF'D STATEMENT ERROR" and will convert the program to a predefined line. Once an error has been trapped the guilty line number can be traced from the variable EL with the usual condition and

called as the ER variable. The function ERR=ERR0 gives you the error message corresponding to ER.

INCLUDE allows you to continue program execution after an error has been trapped. GOTO is a GOTO (or GOSUB) statement which automatically waits for a key to be pressed instead of falling through NEXT commands. Line drawing is handled and numbers while ESC provides the reverse operation. The KEY function returns the value of a switch type joystick, but the industry standard 3-way D plug is not used. PRINT USING allows formatted PRINT output (such as columns of figures) to be produced with the assistance of a float, and PRINT allows you to define the characters to be used in PRINT USING. PRINT is a variable address in



the string handling commands providing searching for one string within another. TRON and TROFF are debugging commands which print the current line number on the screen during program execution, although these statements are often more trouble than they are worth as they limit the screen display.

The graphics commands are a strong point of BASIC V1.3 as they transform program programming from an overall art to child's play. The GOSUB and GIC

## Software on trial

THE PLUS4 has been designed as a market leading computer which catered to students and, if possible, improve Commodore's professional market position. An integral part of the system is a software package provided with the machine and held on ROM for easy access use.

Named 3 PLUS 1, the software provides facilities for word processing, speech filing, spreadsheet operations, and creation of simple graphs. The package is not a sophisticated one and does not offer the features of more elaborate programs available in these fields. However this is the first time that such a package has been made available for a micro-production computer aimed at the home or business user at this price.

So called integrated software packages are the fashion at the moment as the highly competitive market of business software for machines such as the IBM PC. Commodore has achieved several points in the integration rules. The 3 PLUS 1 software is integrated into the machine itself, the programs share many of the same commands, data can be transferred from

one program to another, features from two or more of the programs can be combined to do things like creating mail-files, and the programs with data can all be 'archived' on the machine at one time.

When you reach on 3 PLUS 1 you are greeted off in the word processor. The working area available to you at 17 characters wide by 99 lines deep. Most of the standard features are provided including text entry from the keyboard, individually defined and maximum of four set up points on the work area, copying or moving blocks of text and formatting through the use of relational strings word wrapping the automatically wraps the words on our side at the end of lines, justification by spacing words to completely fill lines and control of the printed output.

In practical terms the documents which can be produced must be relatively short. Letters can be produced and, when used in combination with the data base, circulars or memos are possible. It would be over ambitious to attempt to write books or lengthy articles.

A major concern on the software is the way that the screen display is used. Only 17 characters are shown across the screen and this means that a line less than half the width of the document is visible at any one time. This makes reading the documents difficult as you must pass through the long lines into side to the other to follow a sentence through. Auto it makes a difficult to print and the format of the final document. A plus one often used to describe some word processors is "what you see is what you get", meaning that the display on the screen can be set to show the document just as it will appear when printed out. No one can 3 PLUS 1 provide this.

On using the word processor I found a number of things not to my taste. The commands are generally rather clumsy in use, for example there is no text search. You must use the INS - DEL key to give you a sense of how, as a special command to insert a blank line and then type in the space provided. Having the RETURN key on a wipe out a whole line of text if you are not careful. What working with blocks of text the text is not obviously marked on screen and hence it is easy to make mistakes.

The second program given is a

spreadsheet. This is my least favorite spreadsheet of the four. The principal of a spreadsheet is to provide a grid area where numbers, formulas, and text can be placed and manipulated. The value of a spreadsheet comes from the ease of moving the thing up or standing down and, for many personal applications, the ease of the grid provided. Commodore has had to do some corners with this program in terms of the way in which formulas are processed and the use of the spreadsheet grid.

A grid of 80 rows and 11 columns is provided, which is adequate for many uses, but an additional limitation is imposed by the memory allocation (around 7k) to allow the other programs space in memory at the same time which can mean that only half the grid space can actually be filled. The screen display is normally set to show 12 rows and 11 columns. A half height display is also used. I went deep, to point both word processing and spreadsheet to be shown on the same screen.

Each space or cell, on the grid may contain a number and may also contain text or a formula. Any formula data contains reference to other cells, either explicitly by the cell row and column numbers or by the use of a cell or cell. If a user that Commodore has chosen to require that of the other spreadsheet by using an unusual method of referring to cells by row/column and using apostrophes for the column

reference. It is more normal to refer to columns using letters to apply the column. Also, to make it easy to build up the spreadsheet, a function is usually included which copies a single formula into a number of other cells which automatically corrects the formula for each cell. Commodore has not provided such a function.

Data lists a simple row of the spreadsheet can be used to cover a simple block graph and transferred to Lotus 123, but even simple graphics have their uses.

Graphics produced in low resolution to allow precision directly to standard printers. Automatic scaling is used to produce a graph 20 characters high but the scaling cannot accommodate square values.

Lost and at my expense, most useful comes a data-base program. Once again the program is relatively unimpressive, but it is very functional despite that. However the program cannot be used without a disk drive.

Up to 999 records (block of each record) at a time in an index file can be set up to form a file on a disk. Once set up, the records can be modified, sorted, specific data can be searched for, and the records can be used to provide data for use with the word processor.

The most difficult operation is the initial setting up of the data file. You must specify

what type of data is required on each record and how much space must be provided for each item of data. This information cannot be changed once set up and so you must be sure of exactly what you want before you start to set up the data. After doing this, the rest is relatively easy. Alphabetical sorting is reasonably fast, as is searching the whole file for a particular item of data.

All the 3-PLUS programs are designed to be used with a disk drive. This obviously will restrict the use of a full system. The data base is dependent on a disk drive in most of all.

A separate manual is provided for 3-PLUS. This provides a general approach to installing the programs, as well as reference sections. Each function is individually described with the help of examples.

In summary, if you are thinking of getting a PLUS4 just for the sake of the software, then forget it. You can get much better value elsewhere. As an addition to a generally good general purpose microcomputer it is of more value. If you want to learn the basics of using these types of software programs, but have no immediate grand plans for their use, then the PLUS4 system is well worth further investigation. ■

John Cochrane

4 chips of the 64 have disappeared into obscurity but all that follows FOCUSing is a study of the past. Having been replaced by a graphics system comparable to that of the Microsoft Directed Color Basic used by the Tandy Color Dragon and now MSX machines.

Two different GRAPHICS modes can be set up. The default mode is provided a standard 21 line by 40 column text display, but reference of use of the 4-bit mode courses (8k, of RAM. Mode 1 provides a full-screen 200 x 200 pixel display with the full range of colors (subject to the restriction of only one foreground color per character screen), while mode 2 takes the horizontal resolution but allows three foreground colors in each character space.

#### Split screen

Mode 2 and Mode 3 are similar to mode 1 and 2 except that the screen is split and retains the lines for text on the bottom 4 lines.

allows you to print a string of characters anywhere in any mode, providing useful knowledge of text and 16 row graphics. COLOR assigns any of 16 colors and 8 luminance settings to enter the background, any of up to three foregrounds, or the border. BDN allows you to draw filled and empty boxes which can be printed across three colors, and the very powerful CIRCLE command allows you to draw anything from a simple circle, through ellipses to a triangle inclined at 45 degrees. DRAW provides a straight line between two points and can be used to produce a whole shape (although not as easily as with the Microsoft DRAW command).

LOCATE places the cursor at any screen coordinates and SCALE allows the screen coordinate system to be changed. PAINT fills defined parts of the screen with particular colors. SHAPE and GSHAPE allow blocks of the screen to be printed up and moved. One of the 16 foreground colors is a

color rather than an array the rest of the way. Color is much more restricted than with the earlier Microsoft CRT and PLT commands. The RGBG function provides the X and Y coordinates of the cursor and you also return what is beneath the cursor. BGA returns the current graphics mode, and BLIM the luminance level of a given foreground. All the graphics commands can be specified in absolute terms or relative to the cursor.

#### Sprite capability

One excellent feature of the 64 which has gone is the sprite capability — although dealing with sprites was so painful that most people never bothered with them anyway. Consideration of the standard of some graphics currently being produced on the hardware spectrum leads us to believe that expert game programmers will not find the loss much of an obstacle.

Based on the Plot 4 in a poly shadow.



# And you thought it was just a movie!

Coming soon to save the computer world!

## ACTIVISION

Your computer was made for us.

compared with the brilliant 8Types possible on the 64, but every again it is much easier to access and it still puts many other home macros to shame. The sound is routed through the TV speaker, and is controlled internally via the VIDEOLAMP which provides seven levels (with a default level of zero — which is why we began to wonder whether the sound channel on our monitor was working!).

### White noise

SOUND consists of two tones overlaid, the second of which can produce both tones and white noise. Envelopes are not supported and only the onset time and duration of the tone can be specified, although Commodore do give a table of musical note frequencies which suggests they require obscure values.

Although SID and VIC may be dead TED has arrived, in the form of the built-in TESLAKON which provides a string-of-16 word assembler, assembler and machine code monitor which is certainly somewhat limited in its scope, although adequate for dealing with small sections of code. The only feature notably missed is a trace facility, allowing you to step through your program searching for bugs. However, just one issue is definitely a plus point which should lead more users to widen their programming experience into machine code.

Although the Plus/4 is now ready for launch in the UK, Commodore has been dipping its hands somewhat, because of delays in completion of the built-in soft-man packages, so it will be the new year



before it is available at retail. There has been much speculation over the market penetration of the Plus/4 and the 64 because they are both at roughly the same price band. Although many people expected that the Plus/4 would be simply a replacement for the 64, it is becoming apparent that this is not true, and that Commodore is aiming at rather different types of user.

Commodore sees the 64 continuing as essentially a game machine, with the Plus/4 appealing more to the "serious" home user, with a interest in programming. The Plus/4 uses the same 1301 CPU as used on the 6400, but any machine is

speed this brings is seen up by the more focus to BASIC and memory stretching, to monitor the standard PCW benchmarks on both machines produced effectively the same score. The Plus/4 User Guide was seen only in draft form, but promised to be an improvement on the 64 User Guide, as it contained much of the useful information previously restricted to the Programmer Reference Guide.

Our own impressions of the Plus/4 are that it was well-conceived, more user-oriented, and a marked improvement over the 64 in many other respects. The price of 1200 seems rather steep for production costs cannot be much different from that of the 64, but some allowance must be made for the low software. It is possible that Commodore is deliberately offering the price to clearly differentiate it from the 64, and leave users for manufacturers — just remember how much the 64 cost when it was first announced.

### Get into competition

Of the outside competitors, the QL and Amstrad have much faster BASIC, are technically more advanced, and seem to offer better value-for-money, although perhaps a small user base in global terms. The MSX machines have a similar level of speed offer compatibility but are rather an awkward quantity. How will the Plus/4 fare against the competitors will probably depend so much on how loyal, loyal and vocal always in anything else. ■

Keith & Steven Bruff

# COMMODORE 64 OXFORD PASCAL

## YOUR FUTURE WITH COMPUTERS DEPENDS ON PASCAL

OXFORD PASCAL is the first software package to be designed specifically for the Commodore 64. It is a complete Pascal compiler, editor, and debugger, and is the most powerful and flexible Pascal environment available on the Commodore 64.

OXFORD PASCAL is a complete Pascal environment. It includes a powerful editor, a fast compiler, and a powerful debugger. It is the most powerful and flexible Pascal environment available on the Commodore 64.

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64. It includes a powerful editor, a fast compiler, and a powerful debugger.

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64. It includes a powerful editor, a fast compiler, and a powerful debugger.

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64. It includes a powerful editor, a fast compiler, and a powerful debugger.

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64. It includes a powerful editor, a fast compiler, and a powerful debugger.

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64. It includes a powerful editor, a fast compiler, and a powerful debugger.

### OXFORD PASCAL

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64.

- A powerful editor
- A fast compiler
- A powerful debugger

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64. It includes a powerful editor, a fast compiler, and a powerful debugger.

### OXFORD PASCAL FOR THE COMMODORE 64

OXFORD PASCAL is the most powerful and flexible Pascal environment available on the Commodore 64. It includes a powerful editor, a fast compiler, and a powerful debugger.

AFTER years of rumour about its death, the VIC20 is now officially obsolete, replaced by the Commodore C16.

The C16 comes in a rather plain, clunky case, consisting of dedicated cases to disk, "Intelligence to BASIC", and two software packages, for \$199.99. The 16 in the name refers to the total RAM available, though like the 64 the amount of user RAM is considerably less.

It looks just like any other Commodore machine, in the same case as its predecessor, though in a different colour scheme — the case is dark grey and the keys light grey. The keyboard itself is the usual 1,094 type of thing, with seven keys, and angled though the layout is non-standard, it's not compared to its predecessor. If you've got used to the positions of keys like  $\pi$ ,  $\sqrt{x}$ , F0000 and all the important cursor keys on the 64, then you will have just got on a C16, as there's not all changed round. I find C160 keyboards a little too soft, but typing is a personal thing.

Inside the case is a standard system board, fitted with a bit of extra space. The American version of the machine has a manufacturer's expansion bay, the usual standard of over the decade board. In the UK, there are certain legal provisions for video card licence, but there are no such laws in the UK, so British users usually



Commodore have killed that part of the market stone dead, and made your young Scots programmer, in BASIC version 1.5 is supplied with the machine, which has all the extra commands you would expect on any other machine.

The BASIC sits in 12K of ROM, along with the kernel, which looks after the whole machine, and a number of extensions. The BASIC is Microsoft as you'd expect, but in the happy Commodore shade and without. Programs are edited using the same screen editor as before, but with the addition of a few reference features such as automatic insert mode. The same PRT type graphics characters are available, and the function keys are specially configured in product-oriented key sequences. The default

for "window" commands. Windows are one of the things at the moment, and have appeared on the Amstrad and QL, and now the C16. However, you can have only one window at a time, so it's not really as good as the others mentioned. I believe a similar effort can be achieved on the C64 by POSITIONING anyway. Unfortunately there is the WINDOW command, so the process of defining a window has to be done by a tedious sequence of manual code points.

The C16 has five graphics modes. The display is 160 pixels, with the usual 40 by 25 lines of text, with each letter able to be in a different colour. This is the only one that doesn't take up the entire 10K of memory. In text mode, there are 19 different colours, each with 8 levels of luminance, and dots, effectively giving 119 different colours.



of which can be displayed at once. There are also two-higher modes, one with 4 lines of text in the bottom of the screen, and one without. In high res the resolution

# Sweet little 16

shows out the average value in the same case. There are few components on it, the main ones being the 7501 processor and the system chip that does the clock and bit level producing a TV display. The 7501 is just another Commodore version of the processor 6502 like the 6501 or the 64.

On the C16 with 64K of memory, when you install an 800 pin it brings along something like 10K bytes free. The remaining 24K is used up by the system, so about 80% of a user's file is BASIC. On the C16, you can't really see any other OS. The user can't find however, the memory you need one of the high res graphics modes, another 10K of memory goes down the drain. Surely you could 2K user RAM, less even than the VIC20. This is not the main shortcoming of the C16 — the lack of RAM. On the 19K Spectrum about 1K is left on the case, which is quite ample for many uses, but definitely a 10K problem for a machine that has only 10K in a major oversight by Commodore. It is supposed to be technically possible to expand it up to a Plus1 and onwards to 128K, but Commodore don't have any plans for doing this themselves yet.

## Previous hallmark

It has been the hallmark of previous C16 machines that the BASIC disk is copied onto all the machine's two floppies, such as graphics and sound. It is possible only if a machine to buy one of the many "extended BASICs" other than the BASIC disk Commodore themselves, or one of the independent programs. Well, on the C16

commands use a little strange "long" mainly reserved with the disk drive, and as most users would not have a disk drive, but the supplied cassette recorder does need a bit of "long". Anyway, if you don't like them the KEY command is defined them to be anything else — no POKES necessary on the C16. For entering programs there are a few other commands, like AUTO and BEND, which are again new to C16 users. Some of "advanced programming" will not be supported, as only such features being 100 9-4444 and DO OVER, with no procedures or long functions.

By passing the ESC key, followed by another, various extra functions can be brought in the main interface. It is worth

is 120 by 300 which is about average nowadays, though there is a colour extension — you can only have two colours in one 400 pixel character space, the same as the Spectrum. However you can still have 121 different colours in total. The two remaining modes are "high colour" modes, which have a resolution of 160 by 380 but you have up to two different colours per character space, with only the colour of 121 colours.

## Missing feature

The main feature missing on the C16 compared with the 64 is a screen. Undoubtedly the best feature of the 64, this will be much easier and better to use





pages, as the programmer didn't have to bother about the problems of manually putting things onto the screen and removing them later, since the hardware did it all. The volume of space on the C14 is a real low, and it may make it harder to write quality games for it. The Spectrum programs show that attribute problems can be overcome by skillful software, but it has taken a few years to work it out. How fast it will be worked out on the C14 remains to be seen.

### Graphics control

Controlling the program from BASIC is easy with commands like DRAW, LOCATE, BOX, CIRCLE and PAINT. The Circle command doesn't just draw circles, but can produce ovals, arcs, or any kind of polygon. The CHAR command is a sort of PRINT AT command, that works in any graphics mode, and PAINT is a way of filling an area with solid colours. The speed of the program generally, and especially the filling, is positively wonderful, and the BASIC itself is a little slower than previous CBM dialects.

The sound facilities of the C14 are not half as good as the 64s, but are more than adequate. There are two voices, one for notes, and one for notes or notes, with overall volume control. It may have more features, but they are not accessible from BASIC, and as the Programmer's Reference Guide has not yet appeared, I can't say. As it goes passed through the TV, volume is not a problem.

The built-in music box code because it has much character, but it's better than

nothing. It has a real time assembler, assembler, and various memory read and write modes, though it doesn't have single stepping. It seems to have made some good commands via the cassette recorder (not disk), but I can't be sure as I had no instructions at all for the monitor.

The C14 comes with an open decked cassette recorder, which seems to be the same as the usual one except that it has a different plug. The tape format is similar to beta, so the market for video loaders remains for the C14. It also permits to the automatically draw 1MB disk drives, but also supports a new disk drive, used to be four times faster. The BASIC has various commands to control the disk drive, including various backup procedures, and a DIRECTORY command, and the latter feature is innovative on a Commodore.

As with Sinclair's QL, the 'journal' society on the C14 are something of a sea by Commodore's control of the small Atari type sockets, it is paired with two storage looking ones (DTV type sockets, or two

one's) usually plug anything into them except Commodore's own (including 'super sockets'). They aren't much different to the normal run-of-the-mill switched ones, so putting obscure sockets on the C14 seems to be just a way of selling more games.

The documentation supplied with the review machine was very much pre-release, consisting of a couple of hand-drawn photocopied sheets. What was there was good, though some of the listings were inaccurate. The C14 will be supplied in a 'teacher pack' with four classes, but these too may be unavailable for some.

The C14 is basically a VICE with a better display and more RAM, though when using graphics a double screen is left to the user. It compares directly with the 64, Spectrum and the first. Its advantages include the supplied cassette recorder, good keyboard and better graphics, while its disadvantages are the small amount of RAM and software support. Commodore's views on the C14 are going to take time, because of the lack of games and external wire RAM, though VIC controllers will be better. It can't be so easy to be thought of as a replacement for the 64, though if a had 1MB RAM more than it would be a serious contender. As it stands it does not have enough RAM for much programming, though Commodore's marketing muscle will probably ensure that a lot of C14s will find their way into Britain this year. ■

**Andy Pennell**



EXPERIENCE THE STUNNING 3-D REALISM OF **DYNACOLOR**



IBM, and other trademarks are the property of their respective owners.

IBM, and other trademarks are the property of their respective owners.



You see  
my rapid  
I shoot

In the shops  
from October 19th

# CLIFF HANGER

AUTHOR - JAMES DAY ORIGINAL MUSIC - BRIAN DOE

Thrill to the cartoon style action of *Cliff Hanger*, a really original, Wild West game. As Cliff the hero, you've got to stop the bandits shooting up the canyon. But with its own brand of really cartoon action fun, things simply aren't as they seem in *Cliff Hanger*. For a start, the boulder you throw at the ol' bandits may just come bouncing back at you. *Cliff Hanger* incorporates all the elements that have made *New Generation* games best sellers for the Spectrum, such as original ideas, superb graphics and hilarious happenings - but now it's available first for the Commodore 64. Featuring 50 separate screens, three levels of difficulty, one or two players scoring, Hall of fame and joystick compatibility or user defined keys, *Cliff Hanger* is set to be **THE** Commodore games playing sensation. Available from any good software store for just £7.95.

shoota  
ids, then  
ota you!

In the shops  
from November 23rd

# Shoot the Rapids

AUTHOR - PAUL BUNN

Ever wondered what it would be like to face the fierce white water in a top class canoeists slalom run? Well wonder no more because you can enjoy the fast action thrill of competitors canoeing from the comfort of your own armchair with *Shoot the Rapids*.

It's a game that involves real skill because you must move your joystick to simulate paddling action. You must get through the gates of the slalom course in the fastest time possible, while avoiding the river bank and rocks. There are also extra hazards like rapid speed boxes and interfering boaters to worry about.

The multi level game features increasingly difficult river courses with superb graphics and smooth scrolling along the river. Qualifying times have to be reached to move onto the next course.

With Hall of Fame, one or two player scoring and joystick compatibility, *Shoot the Rapids* is probably the best sports action simulation game devised to date. Available from any good software store for just £7.99.

**Competition  
Software**

COMPUTER SOFTWARE  
100, 100/100



Some Competition products are sold exclusively to  
the members of trade and conditions of sale

# Some useful DATA for the 1520

16-year-old Sarah Cotton tackles some problems she's encountered in using the 1520 printer/ploter and the use of DATA statements in programming.

THE 1520 printer/ploter, for use with the Commodore 64 or 64C, 80, is one of the cheapest and most versatile of the Commodore machines, chiefly designed in the home user market. In this article I have found instructions how to set about writing it in as simple a way as possible.

It is assumed throughout that the printer is set at device #8 (although some may be at device #9). If you experience any "device not present" errors in writing the inside number of the OPEN statement to 8.

## Simple

Let's begin with a simple program which will get the printer/ploter to print one card name. This is intended to test your C64 and check that the gear has correctly engaged.

Run the program to assure yourself that it works.

Line 10 tells the computer that you want to talk to the 1520, indicated by the card number which is called the device number. The card number is the file number, which can be anything from 0 to 255. The card also tells the computer the particular card you want the file to deliver. In this case you want to print the card 0.

When you enter the file 0 again on line 40 the computer knows that the file is on 0, send the printing character and accordingly.

Line 50 finishes the program by closing the file.

Let us develop our original program by adding the lines in Program 2.

Line 07 opens up another file, the name called 2. This line 2 tells the computer that it is to be used for changing values.

Line 21 actually performs the task. The 2 tells the computer we want to change the pen colour, and 1 is the card number of file. The numbers can be other values as given in the 1520 manual.

## File numbers

By changing the file numbers in the program and check that you understand the principle of using them. Remember that you will also have to change the numbers in the PRINT statements.

You can improve and alter the way the printer works on your name. I leave the character list by adding the lines in Program 3.

The numbers for the other character sets are given in the manual.

### Program 1

```
10 OPEN:4,0
40 PRINT=1, YOUR NAME
50 CLOSE:
```

### Program 2

```
30 OPEN:4,2
30 PRINT=3, 2"
70 CLOSE:
```

### Program 3

```
15 OPEN:4,2
25 PRINT=3, 1"
30 CLOSE:
```

### Program 4

```
OPEN:0,4,0
CHAR:0
LIST
CLOSE:0:
```



With a little help from the manual you could change to lower case KEYIN 5:5:5 PRINT 5 ^ ^) or change the character OPEN 4,4:4 PRINT 4 ^ ^) Don't forget to close the files at the end of the program.

### Listings

Let's see you have just written an exciting and original game for Commodore Amecore and now want to get a copy on paper what do you do? Listing out programs on the printer is easy, although not exactly fast (especially if they are really long) but do not despair — the quality is very good.

What to load up a program onto your computer and then type in the lines in program 4. Unfortunately the 1500 cannot print out the normal control characters used by the computer — it has its own special characters. These are shown in the manual.

Use the 1500's plotting capabilities. You can think of the paper as your screen at a particular paper size. When you write in on the origin, 0,0 is at the position where the pen starts. See figure 1.

From the origin you can go up 999 steps down 999 and across 999 each step being 1/5 inch. Points are given using (X, Y) in columns relative to the origin. Type in and try program 5.

Obviously you will want to draw much bigger pictures, but you could find yourself running off the top of the paper. You can draw them in two ways — either by using the paper feed before running the program or much better by actually unrolling a line to do this. Try program 6.

Notice that if you change the pen-size of the origin you have to set print ^, ^ to move and ^ to draw.

The coordinates in both of the programs were held in data statements, but this is not the only method for plotting. If you want to draw the graph of  $y = x^2 + 1$  the program will take the rest of the page.

Open file. Move pen down paper. For X = 1 to 90 For Y = X + 10 Draw to (X, Y). Next X. Close file.

You will notice that many of the 1500 programs use the screen and the use of DATA statements. Let's go on now to look at the actual programming and what has applications in many types of programs including those requiring control of sound, graphics and string handling.

### DATA statements

The data statement, along with the related ones of Restore and Read is one of the most versatile parts of Basic. It is used when several unrelated numbers or words are required to be held in the program and ungrouped them directly into variables is not the best or feasible.

This short program number 7 should help you to understand how the three commands work.

List 10 keys in the numbers and the word in the DATA statement and places each in a separate variable.

### Program 3

```
10 OPEN11,4,1:REM OPEN PLOTTING FILE
20 PRINT#11, "H":REM MOVE TO ORIGIN
30 PRINT#11, "M":REM MOVE TO POSITION 10
40 FOR T=1 TO 4
50 READ M,Y
60 PRINT#11, "O":K,Y:REM DRAW TO POINTS 0
70 IN IN DATA STATEMENTS
80 NEXT T
90 CLOSE 11
100 DATA 40,10,40,10,20,0,20
```

### Program 4

```
10 OPEN9,4,1
20 PRINT#9, "H":REM MOVE TO ORIGIN
30 PRINT#9, "M":REM MOVE DOWN 200
40 PRINT#9, "I":REM SET (0,-200) AS NEW 0
50 PRINT#9, "R":REM MOVE TO POSITION
60 (20,0) RELATIVE TO NEW ORIGIN
70 FOR T=1 TO 3
80 READ M,Y
90 PRINT#9, "J":K,Y:REM DRAW TO POINT REL
100 ATIVE TO NEW ORIGIN
50 NEXT T
100 CLOSE 9
110 DATA 20,0,150,200,20,0
```

### Program 5



### Program 7

```
10 READ M,Y,Z
20 PRINT#1,Y:Z
30 RESTORE
40 GOTO 10
50 DATA 12,4,HELLO
```

```
0 POKE30070,15
10 FOR N=1 TO 20
20 READ M,N
30 FOR Y=1 TO 10
40 POKE30070,M
50 NEXT Y
70 NEXT N
80 POKE30070,0:POKE30070,0:END
90 DATA 10,145,5,324,20,200,1,130,50,245
100 DATA 40,200,20,125,00,177,10,100,20,1
44
110 DATA 20,130,70,240,50,211,60,134,0,20
1
120 DATA 10,135,50,107,70,150,50,133,00,1
90
```

#### Program 7

```

1000 RESTORE
1005 INPUT @GGGGGGGGGGGG, FIRST NAME :F#
1010 FORK:=1:G1:0
1020 REYNOS,N0
1030 IFN#="P" THEN PRINT @G@_NUMBER: "END:FO
RT=1703888: NEXT:=GOTO1888
1040 NEXT
1050 PRINT @G@_NAME NOT FOUND :FORT=1703
888: NEXT
1060 GOTO1888
2000 DATAJANE,JOE,JACK,ROBBY,BILL,419,PET
C,907,WALLY,903
3000 DATAHILDA,BOB,JILL,JOE,MARTIN,927,M
ARY,572,HARRY,889
3800 REM PROGRAMMING INSTRUCTIONS AND ME
ED TO TYPE THESE IN
3010 REM @ =CRSR DOWN
3020 REM _ =CRSR RIGHT
3030 REM & =BLACK
3040 REM = =PURPLE
3050 REM < =RED
3060 REM L =CLR
    
```

#### Program 8

```

10 FORI=8TO5:1
20 FORJ1=88+1..POKCC32788+1:3: NEXT
30 FORL=1:TO8:REPDU+POKE:P1=88+1..:J1: NEXT
40 POKE:30928,333
50 DATA29,29,9,82,3,28,34,85
    
```

#### Diagram 1



Line 30 prints them out on the screen. Line 50 is added to tell the computer that when another READ statement appears it should start looking at the DATA statements from the beginning again.

DATA statements are almost essential in the playing of tournaments, being a list of typing time on your record and try our program in "X" and "Y" are loop variables, "X" the score to be played and "Y" the division. You could try changing the score or adding more by increasing the number in line 60. Notice that the "RETURN" command is not needed as the numbers in the data statements only have to be read once.

One useful application for DATA statements is in keeping lists such as telephone directories.

To go on and run program 9 using both letters and numbers names. When you see what it works you could put in the names and numbers of your friends.

DATA statements also become useful as heading graphics.

Nearly all the commercial games you have purchased will have included special graphics which are not designed using the PET graphics on the keyboard.

These characters are called "high resolution graphics." Using DATA statements you can bring up your own games by designing your own high resolution graphics.

If you don't have a program in specific design program you'll have to begin work on that job down on page 47.

# *"Liven up your games with hi-res"*

Design your characters by filling in the appropriate squares as I have done in Diagram 2. Looking across columns left to right you can see that each one has a different number associated with it. These are binary numbers, and the filled-in blocks in your list will represent "bits" of a byte which will control your graphics character. Add the numbers designated by the filled blocks, and when you have worked out all the figures you should be left with 8 numbers, which then should be played in data statements such as those in program 10.

When you have got a try printing at... and a bit more will appear.

Design some of your own graphics and add them to the program. You will have to add it to the loop in line 50 for each case. The characters will stay at "X" and "Y" and loop work through the alphabet.

If you assign the "A" key to the printing of a graphic, then the letter "A" will only appear in any words you may wish to display in your game program if it is in reverse field. ■







HOVER BOVER, REVENGE  
AND NOW

# SHEEP IN SPACE



**Llamasoft**

ILLUMINATION BY JEFF MINTER

THE LATEST CDM 64 WORK BY JEFF MINTER AVAILABLE FROM LLAMA\$OFT

LLAMA\$OFT IS A REGISTERED TRADEMARK OF JEFF MINTER

SL

# The Potty Programmer

From *Alligata* to *Gremlin Graphics*, Tony Crowther has blown a trail of original and highly playable games. Chris Jenkins pins down the man behind *Potty Pigeon* and *Monty Mole*

TONY CROWTHER says he wants to be famous, and he's going the right way about it. His games for Alligata and recently Gremlin Graphics have set new standards for playability, graphics and animation, and characters like *Monty Mole* and *Potty Pigeon* are influencing the future incarnations of the earlier *Blagge*, *Lore* and *Killer Wheel*. Not the least of reasons of being a programming magazine being with them the companions of some actual beer-drinking and coffee.

"I just don't get a penny for the games I write for Alligata — I signed a contract as a programmer, and in all the excitement I didn't realize that out of the dozens more than I could get royalties for my Alligata games while I worked for the company. Now that I've moved to Gremlin Graphics I won't be getting anything."

"Tony's programming career started in commercial software — I did a BBC in school, and bought myself a Vic and taught myself programming. This was when I was 16. I went through basic programming and then taught myself machine code using code magazines available — I couldn't work out what I was doing some of the time, but it was working."



"That's fine as games for Alligata — 'You not proud of them?' — included *Ballroom Bazaar*, *Demol* in *Ultimate Squash-a-Frog* and *Auto Tomb Adventure*. "They were really creative programs. Alligata's fast releases, and when I wrote them I was working from home and getting a royalty, but later I went up to work there."

"Tony's first big success was *Blagge*, using some of the ideas of *Monty Mole*. With Tony's distinctive style however, *Blagge* came across as far more than an MBI rip-off, though it was Alligata's idea to produce the game. "The programs I'm working on now are jobs offered between myself and Gremlin, who offered me £8,000 for *Potty the Potty Pigeon*. I wrote *Prey* as all the depression on leaving Alligata, and Gremlin offered me a sharecropper as well as the advance on the game."

## Secrets

Gremlin's managing Director is Geoff Brown, who also runs Gremlin/ULS Code. Geoff contacted Tony after seeing his Alligata games, and Tony, who was a regular at Gremlin's Bluefield company shop, had Moore just made exclusively for Gremlin.

But just what is it about Tony Crowther games that makes them great? So far the distinctive large colourful graphics and smooth scrolling effects have made each game easy to recognise as a Crowther effort — but as Tony explained, this may soon change. "There isn't anything about either the programming techniques I use or the way I create a full screen with as much detail as possible. The hard bit is to write *Monty Mole*, which is due out in October. The screen only took about a week to do, and I designed it while I was on holiday, in Spain. Instead of using the layers system, which forces where you are to scroll in, I just drew 250 characters and built the screen up going down. It's then much easier to get smooth scrolling."

## Scrolling

"The best of Tony's programs is a screen scrolling routine with a character set, and after getting the boring bits out of the way, it was done to play the game."

"With *Potty Pigeon* I didn't have any idea what I was going to do!"



Chris Jenkins: "I wrote the first mouse-driven program, *Robotics*. There are three layers to the background, which moves at different speeds, so I used that idea and the theme I worked out with my girlfriend."

## Monty Mole

"*Monty Mole* is similar to *Sea of Blagge* — the same type of scroll, but a lot better. Unfortunately there were problems with the first batch, because the tape duplication couldn't get the periods to work, so they changed the program. They corrupted the character set so that there were 1,000 'A's' in the program, and they duplicated 3,000 copies of an anyway irrelevant. Some error in creation, and it never auto runs — it has a red mass, but from now on I'm making sure to check the duplication myself."

Perhaps Tony's first known program, *Monty Mole* received somewhat of an average due to its original in-line code scrolls to the main screen. The character was the idea of Gremlin's Ian Newton, and the original version was by Peter Harrop for the Spectrum. We looked at that and decided we wanted to do things that you couldn't do on the Spectrum, like the main being generated randomly every time, so we decided for the MBI to use characters but a lot of differences, you only get out £10, the original game offering just £10, and £100 for



the world's best — there's a game called *Dragon* with a B&B of a job, it's going on TV. Don't know if dad is a writer, or maybe a story in the local paper, and the way things we were being educated by the weekend papers and the TV people. I was in Spain or I missed it all — but I would love to see if they'd agree that we graduated with the President of the Civil Board!

So Tom's "realistic" games, with a large playing area with swirling backgrounds and fast action, combined with original characters, have been a big success. And don't be afraid to turn on doing that sort of game? No — I've done enough of those — I'd like to do a really good shoot 'em up! *Sekrete Express*, the latest Grenville game is the same sort of idea as *Looco*, but it's a lot more fun and the graphics are better than anything I've done before!

Tom's a master of UK software on a very high — Everything seems to be a copy. *Looco* is actually based on an arcade game called *Sektor Comets*, but I only saw this game and I wrote the game's first level so it's not a copy, copy. I had, at Amstar was software programmer and got some other there. The idea, for my game's characters was borrowed from their comic book characters by a friend — I got him to do the first Michel Jerry music for *Looco*, but as it's done with a really fast through (I was)

based the *Comets* Plus, I was when I really wanted was *Proton* by the *Vampire Mage* characters, which is also given later on *Secrets*. *Sekrete Express* is another one I've abandoned from their music it's a My piece from day 2.

#### Developer

Tom's games should now be heading in a new direction. Having raised the idea from his Alliance game and those up with even better versions for Grenville, he's now keen to go into new areas. For a start he has to think about his role as a developer of Grenville Computer. "I'm the only one that does a year because all the others have other companies backing them. I get a name for each release sold, and a percentage of the company's profits. When *Sekrete Express* next selling well there should be a lot to coming of."

Tom's latest project is concerned with the Red Arrows RAF display team. They've asked us to write a program — they want Commodore too, and they write back with some ideas, but I just laughed at it! "You're in the job and the code." I've got to figure out a way to make it into a game. It's got to be really well thought out, because it could just end up looking like a commercial game. (I'm a)

Tom's "90" *Looco* has got a lot of good feedback. Drawing specifications on *Looco* help in the design of the game, which adds in some cases more like cartoon than computer games. There's only Amstar's *Bank* on the BBC, that gives you a real feeling of cartoon quality — that's due to the way they draw black outlines around the characters. With my details, it's usually too small to do that. I'm doing some work on the BBC now, but really I don't copy any machines except the Commodore 64. It's so easy to write on, I can get on back and do it. I'll give you that if I do, and the *Bank's* game, but who uses *Bank*? Aside from this, there's nothing against it. I could write my Spectrum game I've seen on the Commodore.

#### Tedious

So while he's seen MSX, and is working on the BBC, Tom's main effort should concentrate to be on the 64 — which is good news for all Commodore games players.

After the Red Arrows project, Tom's latest game includes a game based on the *Rae* (Henryson) *Eye* (Clark) of the *Clarks*, in which meteorological figures handle to the death. The complexities of writing an adventure don't have much appeal anymore — "I do not get deeply tedious, having people trying you up making. There do I get that — You getting the same thing with *Money* (Mick) *Account* (that I've done a to design the cover artwork for *Sekrete Express*, and we've had an artist piece of it) I've seen the Plus/4 and though it's got a screen like the keyboard, you could write a great machine for it, but I think I'd like to see more for the C64. A lot of people will buy it, and MSX is enough to write a good game on — a lot of Amstar software like *Discovery King* and *Pair* (Puzzle) on a 64, and the early *Ultimate* games for the Spectrum. There's plenty you can do with MSX — like a good shoot 'em up!" Tom's comments, pointing to a favorite theme.

#### Who to read

Tom's also working on a book on writing programs for the 64. "It's got some ideas in it, but it's largely going to be on machine code — things like screen scrolling, external characters, machine code, internal characters, playing sounds, using interrupts, that sort of thing — it might put me out of business!" We're looking at several titles before. "But who will write a book now?" "Tom!" I'm saying it, getting reviews in the magazines and getting my name in print. It's not the money that I'm after — I haven't got a Mercedes, I don't even drive. But I've got a good contract with Grenville and a copy-book full of stories of my game. Everyone in Sheffield knows me, though I don't get invited to open supermarkets yet. Grenville's going into the American market through UK Ltd, but I haven't follow up to US Ltd, and we've got writing contracts to come up with some idea."

"I took a little holiday with me on holiday in Spain, and it's full of ideas."

It should be interesting to see what greater South Down Tom's little company does.

# ANIROG

NICK-NICK!

## P.C. FUZZ



**Also available on  
Disk at £9.95**

Aggro at closing time at the local! Getaway car screeches to a halt outside a bank. Ingenious methods employed by the Mafas to literally spirit away the loot from the High Street. Never fear - P.C. Fuzz is on patrol!

COMMODORE 64

£7.95

TRADE ENQUIRES: ANIROG SOFTWARE LTD, 31 WEST HILL, DARTFORD, KENT (SS20) 42113-75.  
MAIL ORDER: 1 HIGH STREET, HORLEY, SURREY. 24 HOUR CREDIT CARD SALES: HORLEY (02034) 6092.  
PAYMENT BY CHEQUE: P.O. ADDRESS/MSA, 50p POSTAGE & PACKAGING.

# An ode to joy-sticks

Frank Atagley's novel demo program shows you how to exploit your 64's joystick routines

HAVING SOLICITED your aid, chances are that at some time or other you will find yourself parking with more of your hand earned cash for a joystick. When this reflexes are needed to play some arcade game, it's much much easier to press a button to push the stick in the required direction than reach a keyboard for that fabled "W" for up, "A" for left etc. Possession of one of these hand gadgets will also enable you to use it in your own programs, and if used in no full extent, you are otherwise invading the keyboard as all.

Having said this, we need to know how to use pointers a joystick routine into our programs. A quick look at the Commodore User Manual reveals absolutely nothing! What we need is to have a routine in our main program to check values held in BITS 0030 0030 with the joystick in port 2 (0030) (see part I). The first five BITS of BITS 0030 are used to detect joystick movement.

## Activity

If you type in the Extended Joystick Demo Program, having set the BREAK if you wish, then this will show exactly what is going on inside the computer when you move the joystick. A chart is displayed at the top of the screen, which contains the settings at the address.

The second row in the chart shows that with the joystick in a central position BITS 04 are turned on. The top row gives the decimal value for each BIT. The third row displays the BINARY value by changing in a ONE when the BIT is turned on and ZERO when it is off. The BIT number is shown on the bottom row. Just underneath the chart goes in the format to be used in our IF-THEN statements, with the decimal code for each direction as well as the five buttons.

This format may be used in all of our IF-THEN statements, which we will need to use to determine which joystick direction has been used and what we are going to do about it in the demo program, however, PERKS without 0030 can't occur, in port 000. The computer then stores this value in the variable 0 and uses the appropriate action from one of the next IF-THEN statement lines.

## Address

Now by moving the joystick and pressing the fire button. This will see the BITS turning on and off and the binary and decimal values changing. By adding together the decimal values of all the BITS which are turned ON, we will arrive at the BITS value held at this address. With some modern physics there are a total of eighteen different combinations that we can use. The movement of the joystick at the bottom of the screen moves this by jiggling a total of eighteen different objects for the different combinations of movement and firing. This is only a simple demonstration, but shows that we can make an automated character perform eighteen different tasks. For instance, his character could be, say, a cowboy who walks left when we move the stick left, fire a gun while walking left when we press fire at the same time. If we

move the stick diagonally up and left and fire, then he could draw a horse etc etc.

Needless to say, not all of the IF-THEN statements need be used. If we only wanted to move left, right, up, down and fire then only the first five lines from 000 000 of the demo program would be used. Instances of all of the eighteen IF-THEN statements in an arcade game or file would probably be considerably slow in some instances.

## Ability

After you have studied the effects that the joystick movement has on the chart on the screen, we can experiment a little by modifying the program slightly so to be able to move the jiggler about the screen. First define lines 000 000 in the demo program. Now alter lines 010-040 as shown in figure one - see formatting to add line 005. Now save the new version of our program before running. Inexperienced programmers may wonder about the perils of retaining an untested program! Now when we move the joystick - "Hey Presto!" our jiggler moves about the screen in any one of eighteen different directions, because of



As shown in Figure 1 (part I)

the fact that the computer is still going through a lengthy routine as follows: update the chart display, movement is not very fast. That is why X and Y are incremented or decremented by two pixels rather than the more usual and smoother one. For extra speed, by altering the code in a higher figure. Note that when the fire button is pressed with the joystick in the upright position, the screen will change to a random colour.

## Advantages

This is not the ultimate routine to move a sprite across the screen, but it does have the advantage that we have at least random eight or more options open to us. For instance, by moving the joystick in one direction and pressing the fire button at the same time. Nothing happens. Our jiggler doesn't even move. On looking at the chart at the top of the screen we can see that several BITS are turned off, and the total decimal value adds up to a figure not covered for in our IF-THEN statements. We defined them as lines 000-009.

Now, in a final programme, type in the following lines 000 000 but add four new commands, like making the border change colour or perhaps make a difference sound for each direction if the fire button is pressed simultaneously. The more advantages that you make the jiggler a different colour or make him disappear!

This then will give you something of how to use a joystick in your own programs. It's not the only way but probably the simplest and more accurate way to do it. Remember, inclusion of a joystick routine in a program can make it much more acceptable and certainly a lot more fun. ▶

## Modifying the program - Figure One

```

010 IF 0 = 111 THEN POKE 0001 000
02000000
030 IF 0 = 125 THEN X = X-1
040 IF 0 = 119 THEN X = X+1
050 IF 0 = 126 THEN Y = Y-2
060 IF 0 = 125 THEN Y = Y+2
070 IF 0 = 102 THEN X = X-1 Y =
Y-1
080 IF 0 = 018 THEN X = X+1 Y =
Y-1
090 IF 0 = 011 THEN X = Y-2 Y =
Y+1
100 IF 0 = 117 THEN X = X+1 Y =
Y+1
110 POKE 0001 POKE 0001 Y

```

## Variable list

J	Joystick address (0030)
M	Memory address for sprite 0 Data
V	Videochip address
PI	Sprite position
DIR	Direction
BITS	Bit information array
SL	Sprite 0 Position
D	Data for sprite
TA	Total of BITS array
X	Sprite 0 x position
Y	Sprite 0 y position
Y(2)	Screen position for jiggled area
PAUSE	Time awareness
Z	Pixel value for jiggled area
Q	Frame loop
CC	Colour code
S	BITS values of 0030

```

10 REM *****
20 REM # EXTENDED JOYSTICK DEMO #
30 REM # BY #
40 REM # FRANK BINGLEY 1984 #
50 REM *****
100 J=56320 N=12800 V1=53248 P=200 X=145 Y=200 CC=54272
107 REM *****
108 REM # SCREEN DISPLAY #
109 REM *****
110 POKEV1+30,0:POKEV1+31,0
120 PRINT"REG" PRINT"DEC(VAL) 20000+40000001:0000000040000001"
130 PRINT PRINT"PULSE" PRINT PRINT"BINARY" PRINT
140 PRINT"BIT NO.00000000000000000000000000000000"
150 PRINT"00000000-----",
160 FORR=1700
170 PRINT"00000000|0000|0000|0000|0000|0000|0000|0000|"
180 PRINT"00000000|-----|-----|-----|-----|-----|-----|-----|"
190 NEXTR
200 PRINT"00000000|0000|0000|0000|0000|0000|0000|0000|"
210 PRINT"00000000|-----|-----|-----|-----|-----|-----|-----|"
220 PRINT"POINT = IF PEEK(56320)= THEN,...
230 FORR=1700 READ B(R)-NEXTR
240 DOUBUR000
257 REM *****
260 REM # LOCATE SPRITE DATA #
270 REM *****
300 READSL FORR=8T0127:READ B:POKEH+R,B:HEXTR
307 REM *****
308 REM # BALL POSITIONS INTO ARRAYS #
309 REM *****
310 DIM(21),BALL(21)
320 FORR=8T021:READL(R):POKEBALL(R)+CC,INT(R/63):#14)+1:HEXTR
330 FORR=8T021:READI(R):HEXTR
337 REM *****
338 REM # TURN ON SPRITES #
339 REM *****
340 POKE20+0,200:POKEV1+21,1:POKEV1+30,1:POKEV1+20,1:POKEV1+30,14
350 POKEV1,X:POKEV1+1,Y:POKEV1+20,1:POKEV1+20,1
497 REM *****
498 REM # MAIN PROGRAM #
499 REM *****
500 POKE20+0,201:G=PEEK(J)
510 IFG=111THG=65
520 IFG=123THG=60
530 IFG=119THG=30
540 IFG=126THG=83
550 IFG=125THG=97
560 IFG=122THG=8
570 IFG=118THG=42
580 IFG=121THG=168
590 IFG=117THG=40
600 IFG=106THG=50
610 IFG=102THG=80
620 IFG=100THG=91
630 IFG=101THG=95
640 IFG=118THG=97
650 IFG=107THG=90
660 IFG=107THG=100
670 IFG=103THG=94
680 IFG=127THG=01
690 DOUBUR000

```

```

700 POKE2040,200
710 GOSUB3000
720 GOTO500
4997 REM *****
4998 REM * UPDATE SCREEN DISPLAY *
4999 REM *****
5000 TR=0 FORN=1TO8:BITOR)=CHECK(J*AND DOR):TR=TR+BITOR: NEXT
5010 PRINT"*****";
5020 FORN=1TO8:IFBITOR)C)THENPRINT"  ON";:GOTO5040
5030 PRINT"  OFF";
5040 NEXT:PRINT:PRINT"*****";
5050 FORN=1TO8:IFBITOR)C)THENPRINT"  1";:GOTO5070
5060 PRINT"  0";
5070 NEXT
5080 PRINT:PRINT"*****:PRINTTR(24)"
5090 RETURN
5997 REM *****
5998 REM * ANIMATE JUDGER'S ITEMS *
5999 REM *****
6000 FORN=1TO21:IFN=1THENFORM=1TO10: NEXT
6010 IFI(R)=1THENPOKEBALL(R),2:GOTO6030
6020 POKEBALL(R),32
6030 NEXT
6040 RETURN
19997 REM *****
19998 REM * DECIMAL DATA *
19999 REM *****
20000 DATA20,64,32,16,8,4,2,1
20007 REM *****
20008 REM * SPRITE DATA *
20009 REM *****
30000 DATA0,20,0,0,40,0,0
30002 DATA20,0,0,20,0,0,20
30003 DATA0,255,0,15,255,152
30004 DATA127,255,240,0,239,60,0
30005 DATA255,13,0,239,0,0,255
30006 DATA0,85,0,0,85,0
30007 DATA0,65,0,1,65,64,1
30008 DATA63,64,1,63,64,1,63
30009 DATA64,1,63,64,10,130,160,0
30011 DATA0,20,0,0,40,0,0
30012 DATA20,0,0,20,0,0,20
30013 DATA0,239,0,0,239,240
30014 DATA15,255,233,60,239,0,112
30015 DATA20,0,0,239,0,0,255
30016 DATA0,85,0,0,85,0
30017 DATA0,65,0,1,65,64,1
30018 DATA63,64,1,63,64,1,63
30019 DATA64,1,63,64,10,130,160,0
35997 REM *****
35998 REM * SCREEN POSITIONS FOR ITEMS *
35999 REM *****
36000 DATA1004,1044,1004,1764,1720,1602,1720,1759,1799,1039,1079
36010 DATA1004,1044,1004,1764,1720,1602,1720,1759,1799,1039,1079
36017 REM *****
36018 REM * DATA FOR JUDGING SEQUENCE *
36019 REM *****
36020 DATA1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0

```





gains will increase, look out to become a major force in the industry. **Reviewer's** remarks were graphically, and the scenario is no less fun, but it's fast and Funco had had no formal entry quality. Loaded at approximately 2000 a point a variant of Golem, in which there were demands for an eight-year and the excitement of Motherday has to be dealt with many special projects. Personally I have to lead the way to look at **Reviewer's** terminology, which must be a good sign.

**Program:** **Reviewer's** 44  
**Supplier:** Activision  
**Price:** 29.95  
**Graphics:** \*\*\*\*  
**Sound:** \*\*\*\*\*  
**Control:** \*\*\*\*\*

## Son of Patrol



**Program:** **Patrol** is a revised Defender-derived shoot 'em up, and EPD is a classy sequel programmed again by Steve Lee.

If you play **Patrol** NTDL, you won't be breathlessly detailed about the use of pyramids, bomb seas, wrecked barrels and buried rat droppers — launch missiles forward or down at incoming helicopters before they tell you, or land lethal anti-aircraft ammunition. Watch your radar display and knock out radar jammers, landing on your pad or refer to same to take the next wave of battles.

Great control music by Steve Lee, and the best explosive post-mortem ever. Don't forget EPD is on offer at 12.95 at the moment, as are many other 64 and 16

games from Funco.  
 Another one for the shopping basket type.  
**Program:** **Patrol** Patrol 1, 64  
**Supplier:** Virgin, 24 Vernon Yard, Portobello Road, London  
**Price:** 17.95  
**Graphics:** \*\*\*\*\*  
**Sound:** \*\*\*\*\*  
**Control:** \*\*\*\*\*

## Knockout



**Control:** **Knockout** is the most interesting title, designed for your 16-bit games, and **Knockout** will keep you more popular for the weekend. It's not that an particularly good, but **Knockout** can't be beaten.

The previous-only great points, you at a declared champion, instead which you may control light (it was excellent). Search for the hidden because chest, avoid spinning punches, better flying dragons and dragon's eggs. You can run your controls through with your eyes when a late round, otherwise you'll be fatal. You can also throw punches, but they have the habit of wandering away to knock out.

With 80 levels and a time limit to play against **Knockout** isn't very money to look at, but could offer some hours of play to the dedicated.

**Program:** **Knockout** copyrighted Vt.  
**Supplier:** Commodore, Weldon North, 1st St Colby  
**Price:** 14.95  
**Graphics:** \*\*\*\*\*  
**Sound:** \*\*\*\*\*  
**Control:** \*\*\*\*\*

## Living on the ceiling



Easily the best thing to emerge from Citybound, **Living on the Ceiling** is 17 games to see. You play the eccentric James, who moves around the three floors of a hotel using elevators, avoiding the manager, the boss of the previous manager, and a female cleaning trolley, by keeping one

them. There are 18 rooms to hide in, and — here's the happy part — 15 of these contain games machines which you can play to add to your score. Inspired from **Living on the Ceiling** is **Wid Walker**, with marvellous sprite animation and outstanding musical score! (99 Red Robinson, Fide To Copy, etc), the two games are all perfectly playable in themselves, and make **Living on the Ceiling** the most original and value for money program for the 64 yet to emerge. Just one question — why does it play? Living on the Ceiling every time you hide in the area?  
 By the way!

**Program:** **Living on the Ceiling**, 64  
**Supplier:** Triaxial, Devby House, Devby Street, Bury  
**Price:** 12.95  
**Graphics:** \*\*\*\*\*  
**Sound:** \*\*\*\*\*  
**Control:** \*\*\*\*\*

## Exam time



While doubtful about the value of some educational software — after all, it's the teacher that you should be concentrating on — I must admit that the **Exam Software** series looks good. So far subjects covered include Chemistry, Physics, Maths and Computer Studies, at CSE and O Level.

The **Computer Studies** program contains five lessons, the first four covering major problem areas and the last being a database which is intended to aid revision. Each program is menu-driven and illustrates the subject with answering questions.

**Program:** **Exam Software** 64  
**Supplier:** Longman's, Longman House, Burnt Mill, Harlow, Essex  
**Price:** TBA  
**Graphics:** \*\*\*\*\*  
**Sound:** N/A  
**Control:** N/A

## Not serious!



I've never been able to play **Not Serious!** and I can't say that my performance with **Not Serious!** has inspired me to try again. Although the graphics and sound effects are nice, it's no point if you can't get the ball over the net, and no matter how hard I studied the instructions I couldn't work out where I was going wrong. Pass the barby over.

**Program:** **Not Serious!**, 64  
**Supplier:** Myra Software, Software & Technology Centre, Beacon Drive, Boreham, Essex  
**Price:** 16.95  
**Graphics:** \*\*\*\*\*  
**Sound:** \*\*\*\*\*  
**Control:** \*\*\*\*\*

**Software companies** — send your new releases to SOFT HITS, Commodore Horizons, 11/13 Little Newport Street, London WC2

# THE 64 SOFTWARE CENTRE

1 Princeton Square, London WC1R 4RL

---

*We are pleased to announce our appointment as sole distributors in the London Postal Area for GEMINI SOFTWARE for the Commodore 64. All items are available from stock.*

---

Gemini software	cassette	disk
	incl VAT	
Database	19.95	24.95
Mailist	19.95	24.95
Stock Control	19.95	24.95
Cashbook (incl VAT)	59.95	64.95
Final Accounts	59.95	64.95
Home Accounts	19.95	24.95
Combined Pack No. 1		
Cashbook, VAT, Final Accounts	59.95	64.95
Combined Pack No. 2		
Pack No. 1 + Stock Control + Database + Mailist	139.95	150.95
Combined Pack No. 3		
Home Accounts, Database, Mailist	34.95	39.95

---

*We stock the widest range of software for the Commodore 64: business, home, utilities and aids, music synthesisers, games, adventures, war and flight simulators — on disk, cartridge and cassette. Demonstration facilities. Open 10am/6pm including Saturday. Tel No 01-430 0954*

# Dr Watson solves the 64 machine code

*Chris Whitcombe educates himself in Machine Code with two teaching packages, and tries out a basic compiler*

ANYONE trying to teach me Machine Code would have no acceptable test. My friends who understood this strange language say "how've you got to forget all about BASIC and think in MFC and Hexa-decimal?" It's almost that I find it difficult to follow this subject, good as it may be. I don't even think in hexa-decimal! I will believe in feet and inches and half-crown!

Unfortunately, BASIC is not good enough if you want your Spidee Brains to travel about the screen in something more than a snail's pace, so I suppose that I am just going to have to knuckle down to some serious study.

Despite my pessimistic thoughts, we are quiet as blind as the rays may at first seem. There is plenty of help about in the form of books and teaching packages.

One such offering comes from Honey-bolt's (Dr Watson computer learning centre) and is called Regener's *Assembler, Language Programming for the 64000*. The package contains a book, and a cassette. On the tape is a full 64000 Assembler, a Machine Language Monitor and a Binary/Hexadecimal/BCD soft-running program. The introduction to the book implies that no pre-existing knowledge of Assembler is required. I hope this is the case!

## Let's review!

Chapter 1 starts at a fast but friendly pace using short programs to explain a few of the instructions that you will need to get started. You are then shown how to list what you have typed in, using the Assembler and the debugger, a subtle warning the Assembler program and what it looks like in Machine Code. More comments are then added to the program and explained in more detail, along with a diagram showing the relationship between the Accumulator, ALU, X and Y registers. Like most of the chapters in the book, this one is liberally sprinkled with exercises throughout. "Just like being back at school!" I bet you say. But with these, nobody will know if you cheat. Except you. Actually they are quite a good idea, as they do help you to discover whether or not you really have understood what you thought you had understood. Having learnt how to manipulate information into and out of the Accumulator and Registers, chapter 2 shows how to jump around a

program a sort of machine code GOSUB.

The author starts explaining about the Program Counter, Unconditional jumps and a few more commands to help you on your way. The chapter ends with a short section on flags. I think I'm going to have to read this bit again, and do the exercises at the end. The next chapter starts by explaining more instructions on outputting information to the screen. The examples (intentionally) run to show that you need some "magic". This normally leads me to a machine about every 100ms. In BASIC, nothing ever happens fast enough. In Machine Code, it seems the reverse is true. There are different "modes" of addressing in MFC and these are all explained at some length at the end of the chapter.

## Logical!

Chapter 4 starts with Logical operations and continues on into the use of Hexa-decimal numbers. Binary Coded Decimal (BCD), Multiplication and Binary, Decimal and Multiplication. "Gulp! Huh?!" says I through the book and things are starting to get heavy. We are now up to Advanced features of the Assembler including the use of Labels, Memory Labels and Macro instructions. As in all the sections, these comments are explained at great length and you should be able to get the hang of it, if you don't take it too fast! This chapter ends with an explanation on how to convert your Machine Code programs into Data windows. No wonder, then, the Assembler does all the hard work for you. "If you don't want to "mess about" with Assembly Language, but feel instead that you would prefer to work directly in MFC, then chapter 6 is for you. This details the features of the Machine Language Monitor (an option of the Assembler) showing how to enter or debug programs by typing Hex values straight into memory locations (HEX). The chapter continues with sections on printing MFC in memory, how to Save and Load binary files (Hexa) and Register Display and its usage.

If you have got this far in the book and understood it all, then the next couple of chapters should hold no fears for you whatsoever. We are told that, after having learnt how to do things the hard way, some functions can be done more easily and quickly by

the processor's go through by using the MFC built-in capabilities. Most of the more complex programs, like printing a calculator routine, can be readily done by using the MFC.

Chapter 7 is devoted to how to use Interrupts and how to interrupt traps. I am the reader interested amongst you, the use of the interrupt is devoted to signed numbers. Conditions, Floating point numbers and various instructions that could be useful when using the 64000 are in Machine Code programs.

## Labels

Chapter 9 has the solutions to all the exercises set throughout the book. Even Appendix 1 has exercises on it! However, it does also explain in great detail about Binary, BCD and Hex notation. The last 3 sections of the book are appendices of everything you need to know to get your advanced MFC skills to the maximum. All the 64000 instructions are listed along with the number of bytes each Macro, cost and how many clock cycles it takes to execute. The size of the various flags is also shown for each operation and Truth tables are included where appropriate. A memory map lists all the Labels along with their locations and a brief description of what they do. There are also tables here for the Hex, BCD and Hex to BCD. The last section details the Kernel routines and their use.

The package is well presented and the book is fairly easy to follow considering the subject matter. I particularly like the way in which the first couple of chapters are not too comprehensive and lead you gently into the rest of the book. To many authors try to impress you with how clever they are and end up by only confusing you, instead of helping you to understand what they really consider elementary. What you really want to learn is, of course, how I can master Machine Code! Well, no, I haven't. But I do feel that with another couple of reads through the book (and a little less jumping in the exercises) I should be well on the way to learning Assembly in confidence, a professional package well worth a well highly recommended. ▶



Dr Watson — and processor



Computer Machine Code Tutor, by Dr. Watson, is available for purchase

for \$49.95 and at \$12.95 plus a charge for postage and handling.

Another package along similar lines is the Dr. Watson in the **Complete Machine Code Tutor** from New Generation Software. This uses a different approach, however, and, instead of having a textbook and Assembly tape, the offering uses 2 cassettes and what might be, possibly, termed a booklet. While keeping the first tape note, it focuses through the "complete home reference manual" shows it to be really an a directory of what is in the tapes along with a few explanatory notes, most of which appear within the already less complex (but making the computer more or less redundant).

#### Lessons

The 4 sides of tape are filled with lessons and exercises, the lessons being pages of text about all the various instructions and addressing modes used in Assembly Language. The exercises, unlike the Dr. Watson idea, are not in the form of a test, but are more an example program being. By pressing the Return key, the results is supplied through the program line by line, and the changes made to the contents of the registers, flags, etc. are displayed in table form along with a 1 line explanation of what is happening. Although you can edit the program and use the different values in the registers, you cannot actually run it to see what it does. This is because the package does not contain an Assembly program. It is only an Assembly simulator. This means that when you have here is really a textbook on cassette. As most of us are unable to carry any 80's and TV's around with us, it does not seem to have any advantage over the real thing! As such, I'm not sure who it is supposed to appeal to. The information contained on the package is sparse, to say the least, and it does not include an Assembly program. If I'm-80's is not cheap, give me a good book instead.

If you feel unable or unwilling, to get down to some serious study in your quest to master Machine Code, then there is a

possible alternative.

You might like to try a Basic Computer. The **Jeppack DTL Basic** is just such an animal and it promises to improve your Basic programs by making them run faster. DTL Basic 88 is available on tape at \$24.95 or disk at \$39.95, the latter version having the usual advantages of speed, larger program handling and other additional features.

#### Long

This is quite a long program, so while the tape is loading, you will have plenty of time to study the matter that accompanies the cassette. It does say at the back that the company can supply separately the full Computer manual which describes the functions of both the tape and disk computers in more detail. Is there's any wonder or not you have to pay for it? It also states that a user of the tape version may upgrade to the disk version, but, again, no mention of money. After the program is loaded, you are prompted from the screen to enter the name of the Basic program that you want compiled, and the computer will then look for that program

on the tape, and when it finds it, it will load it in to do the business. The Compiler will make 2 passes through the source file while constantly displaying the number of the line being worked upon. When the second pass is complete the user is prompted to load the tape that it is to hold the new version of the program and, if you so command, a copy of the 'New Tape Library File' (which is a list of Assembly routines used by Compiled programs) which is needed to enable your 88 to run the new high-speed program that you have just created. But, looking on the bright side, the DTL file only needs to be entered into the computer's memory once, and then you can run so many Compiled Programs as you like as long as you don't switch off.

The Jeppack Computer performs extensive checks while going about its business and will report all errors found giving the relevant line number followed by an error code, a list of which appear at the back of the book.

#### Loaded!

It is not unusual for CBM Basic to be extended using extra instructions implemented by Assembly routines in ROM or RAM. Fortunately, the DTL Basic 88 has a special feature which takes these in its stride. Also, compiled programs can use various Machine-Code subroutines without too objection.

The Jeppack claims that compiled programs CAN Run up to 25 times faster but this coordinate between 5 and 15 times is more typical. A fast garbage collection routine is included that avoids very long delays that can occur in programs with a lot of strings. Compiled programs, it says normally occupy between 50% and 80% of the space of the original program. I ran a couple of my past efforts through 'Jeppack' and they were certainly faster, although it is not easy to judge by how much. Whether or not a compiler is the answer to your programming problems, only you can decide but Jeppack could be well worth a look. I only wish that the complete manual came with the tape instead of it being an "optional extra" for \$19.95. I'm working with Dr. Watson. ■



Jeppack DTL Basic — well worth a look

# THE BEST SOFTWARE IN AGES

C-64  SPECTRUM  BBC  ELECTRON



## FANTASIA DIAMOND

Dive deep into the age of fantasy in a host of intriguing characters that may help or hinder your exploration of this distant world.

Reveals the magnificent Fantasia Diamond enemy states and repair. Save the stolen spy from the capering forests and its evil guardian. Talk to the Robot, Wizard and other characters to help them help. An exhilarating and well-illustrated graphic adventure by Tim Topley for the Spectrum 48K, Commodore 64, BBC Model B and Acorn Electron.

BBP 67.95



## HEATHROW ATC

Your challenge is to get all of the intelligence in to direct the incoming aircraft at the world's busiest international airport. He'll show Monitor the status display of altitude, heading, velocity and aircraft type. Turn the table for legs and tails. Develop your skills to tackle three perilous, major aircraft, radio and instrument failure. A highly acclaimed simulation of one of today's most demanding jobs by Mike Mair for any Spectrum, Commodore 64, BBC Model B and Acorn Electron.



BBP 67.95

**HEWSON CONSULTANTS**

Computer Software for the Spectrum, BBC, and Acorn



## ID LUNATIC

The Lunatic with the jetpack is a futuristic spy. He'll investigate over the terrain and avoid the mountains of the Luna landscape. Equipped with the latest modern tools, identify missiles, radar, navigation and check points on the Spectro-Dash Track. Aerial Minors, missile sites and hoverfighters. You may not see in your mission drive the Spectro-Dash from the Lunatic. A stunning 3D Graphic Presentation by Steve Turner for the Spectrum 48K and Commodore 64.

BBP 67.95

\*All graphics and text screens.

HEWSON CONSULTANTS, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

HEWSON 134

HEWSON 134

HEWSON 134

HEWSON 134

HEWSON 134

HEWSON 134

HEWSON 134



# Are you only using

To play only games in a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain barely ticks over.

To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

And for these you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory. Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.



COMMODORE 8080   
80 words per line (100 CPS)  
Impact head Print speed  
50 characters per second



COMMODORE 8090   
80 words per line (100 CPS)  
Impact head Print speed  
50 characters per second



COMMODORE 8570   
60 words per line (75 CPS)  
Laser jet system on  
4 types of paper Print speed  
175 characters per second



COMMODORE 950   
Printer paper (100 sheets) for  
graphics and graphs Print speed  
54 characters per second



COMMODORE 960   
80 words (100 CPS)  
128K memory S.A. device



COMMODORE 950   
Cartridges, 40K bits  
for Commodore 950 and  
Commodore Plus II



COMMODORE 960   
64K bits for Commodore 960

COMMODORE 1020   
Colour monitor (20000)

OPTIONAL   
Graphics board (100)

MOUSE

See Commodore literature for more

# g 1/10th of your brain?

And for hard copy there are our three printers and a printer/plotter. These will preserve on paper—in colour, black and white, chart form, graphs or text, the fruits of all your labour.

Finally to make games playing more exciting, there are joysticks and paddles.

So use your brain. And make sure you use all of your computer's brain.

For a detailed explanation, the use of 1/10th of the brain above and below, call the COMMODORE INFORMATION LINE OR 1 HOUR (24 HOURS) TOLL FREE COMMODORE INFORMATION LINE. COMMODORE INFORMATION LINE 200000

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

© 1982 Commodore



**Commodore**

# QUALITY CONTROL FROM CREATIVE SPARKS ON C64

**For those  
who demand  
excellence**



**2000 AD**  
 One of the most successful computer games ever, 2000 AD is a classic of the genre. The story is set in the year 2000, and the player is a member of the elite force of the planet Earth. The game is a masterpiece of design and programming, and it is a must-have for any C64 owner.

**4x4x4**  
 A classic puzzle game, 4x4x4 is a masterpiece of design and programming. The game is a must-have for any C64 owner.

**MISSION TO MARS**  
 A classic puzzle game, Mission to Mars is a masterpiece of design and programming. The game is a must-have for any C64 owner.

**WING COMMANDER**  
 One of the most successful computer games ever, Wing Commander is a classic of the genre. The story is set in the year 2000, and the player is a member of the elite force of the planet Earth. The game is a masterpiece of design and programming, and it is a must-have for any C64 owner.

**WING COMMANDER II**  
 One of the most successful computer games ever, Wing Commander II is a classic of the genre. The story is set in the year 2000, and the player is a member of the elite force of the planet Earth. The game is a masterpiece of design and programming, and it is a must-have for any C64 owner.

**WING COMMANDER III**  
 One of the most successful computer games ever, Wing Commander III is a classic of the genre. The story is set in the year 2000, and the player is a member of the elite force of the planet Earth. The game is a masterpiece of design and programming, and it is a must-have for any C64 owner.



**CREATIVE SPARKS**

Available from all good computer software stockists

Send me (tick as required)

- Java Jim £12.95 (UK only)
- 2000 AD £12.95 (UK only)
- 4x4x4 £12.95 (UK only)
- Mission to Mars £12.95 (UK only)
- Wing Commander £12.95 (UK only)
- Wing Commander II £12.95 (UK only)
- Wing Commander III £12.95 (UK only)

Charge card £12.95 each

Single purchase £12.95

Total to send £12.95

Method of payment  
 By cheque or PO (UK card) or credit card

or  
 Enter card no

Signature

Card no

Exp date

Card valid to

Creative Sparks  
 Department Ltd  
 2000 Woodhouse Road  
 Farnborough, Hampshire GU14 7HF  
 Telephone: (0300) 111111

Name

Address

Postcode

City

Country

Order ref

Direct card sales. All orders only  
 Response within 21 days.

CRS124





# MACBETH

## THE COMPUTER ADVENTURE



A package of four completely different adventures lets you character analyse programs

Step into the leading role in one of the most complex and harrowing webs of deceit, treachery and wickedly over-convicted

Text graphics is an integral part of the problem solver  
 Guided by a highly qualified team of

seven of the most experienced  
 computer programmers in the  
 world you'll find new and  
 challenging

Put your computer  
 stretch your  
 imagination

FOR CATALOGUE ORDER SEE  
**£14.95**

© 1990 Creative Sparks. All rights reserved. Printed in Great Britain.

**CREATIVE SPARKS**

Available from  
 All good computer software stores, or

Send me (tick as required)

My/our desired address

Your full list of games

\_\_\_\_\_ copies of this game

THIS 260 is £14.95 each

4 single 160's are

Total to send

£ \_\_\_\_\_ P

£ \_\_\_\_\_ P

£ \_\_\_\_\_ P

Method of payment

(A cheque or PCV or bank made payable to 1990)



By cheque or

bank transfer

Enter details

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

\_\_\_\_\_

Credit cards only. UK orders only.

Please attach 20 day!

Creative Sparks  
 2nd Floor, 100  
 2nd Floor, 100  
 2nd Floor, 100  
 2nd Floor, 100

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CS1004

```

150PRINT@: @: @SCORE@ PRINT@: @: @
161PRINT@: @: @
170PRINT@: @: @
180PRINT@: @: @
190PRINT@: @: @
200PRINT@: @: @
210PRINT@: @: @
220PRINT@: @: @
230PRINT@: @: @
240PRINT@: @: @
250PRINT@: @: @
260PRINT@: @: @
270PRINT@: @: @
280PRINT@: @: @
290PRINT@: @: @
300PRINT@: @: @
310PRINT@: @: @
320PRINT@: @: @
330PRINT@: @: @
340PRINT@: @: @
350PRINT@: @: @
360PRINT@: @: @
370PRINT@: @: @
380PRINT@: @: @
390PRINT@: @: @
400PRINT@: @: @
410PRINT@: @: @
420PRINT@: @: @
430PRINT@: @: @
440PRINT@: @: @
450PRINT@: @: @
460PRINT@: @: @
470PRINT@: @: @
480PRINT@: @: @
490PRINT@: @: @
500PRINT@: @: @

```

```

510 PRINT@: @: @
520 PRINT@: @: @
530 PRINT@: @: @
540 PRINT@: @: @
550 PRINT@: @: @
560 PRINT@: @: @
570 PRINT@: @: @
580 PRINT@: @: @
590 PRINT@: @: @
600 PRINT@: @: @
610 PRINT@: @: @
620 PRINT@: @: @
630 PRINT@: @: @
640 PRINT@: @: @
650 PRINT@: @: @
660 PRINT@: @: @
670 PRINT@: @: @
680 PRINT@: @: @
690 PRINT@: @: @
700 PRINT@: @: @
710 PRINT@: @: @
720 PRINT@: @: @
730 PRINT@: @: @
740 PRINT@: @: @
750 PRINT@: @: @
760 PRINT@: @: @
770 PRINT@: @: @
780 PRINT@: @: @
790 PRINT@: @: @
800 PRINT@: @: @
810 PRINT@: @: @
820 PRINT@: @: @
830 PRINT@: @: @
840 PRINT@: @: @
850 PRINT@: @: @
860 PRINT@: @: @
870 PRINT@: @: @
880 PRINT@: @: @
890 PRINT@: @: @
900 PRINT@: @: @
910 PRINT@: @: @
920 PRINT@: @: @
930 PRINT@: @: @
940 PRINT@: @: @
950 PRINT@: @: @
960 PRINT@: @: @
970 PRINT@: @: @
980 PRINT@: @: @
990 PRINT@: @: @

```



610	DHTR081.00.144-40.170.04.195.095	641	DHTR002.210.169.090.200.200.250.232
612	DHTR081.019.5.200.141.12.200.100	642	DHTR003.240.70.185.170.173.251.0
619	DHTR0.200.141.12.200.200.04.120	645	DHTR041.2.240.104.70.240.190.160
621	DHTR00.101.120.170.05.195.200.17	644	DHTR100.241.4.005.160.220.141.0
622	DHTR000.0.200.141.12.200.100.0	645	DHTR000.70.171.150.70.173.251.0
623	DHTR000.141.15.200.120.70.195.200	646	DHTR041.0.240.00.170.201.0.41
624	DHTR00.204.0.000.170.100.0.160	647	DHTR04.240.15.100.200.141.200.7
625	DHTR0.100.04.195.200.1.200.10	648	DHTR100.0.141.04.170.140.13.200
626	DHTR004.17.000.120.10.200.001.000	649	DHTR100.200.141.10.200.00.170.201
627	DHTR144.0.100.0.100.04.195.000	650	DHTR0.41.000.040.10.100.200.141
628	DHTR000.200.0.0.200.120.170.00	651	DHTR000.0.100.0.041.14.200.141
629	DHTR000.141.201.0.173.251.0.41	652	DHTR000.100.100.200.141.15.200.70
630	DHTR1.240.0.160.1.141.200.7	653	DHTR00.100.190.160.0.141.00.190
631	DHTR00.70.05.100.1.00.104.1.4	654	DHTR000.040.0.141.4.212.100.00
632	DHTR1.70.201.0.41.4.240.00.170	655	DHTR041.0.212.100.20.041.1.212
633	DHTR000.0.41.00.040.0.160.0	656	DHTR000.120.141.4.212.00.200.200
634	DHTR00.00.100.170.201.0.41.10	657	DHTR00.170.200.100.200.10.144.20
635	DHTR040.0.100.2.70.40.190.170	658	DHTR000.0.141.000.190.200.200.190
636	DHTR00.0.41.00.240.0.160.4	659	DHTR00.200.190.160.0.190.200.100
637	DHTR00.40.100.70.70.100.100.0	660	DHTR00.0.4.200.200.204.0.100
638	DHTR100.0.200.100.70.150.0.100	661	DHTR044.70.0.100.0.200.0.100
639	DHTR100.100.141.200.0.100.0.141	662	FOR1=0T0291 REAR0 FOR01=0000+1.0 NEST
640	DHTR0.200.160.120.141.0.200.00	663	FOR1=0T0405 REAR0 FOR040101.1.0 NEST
		664	PETURN



**Mr. Pettigrew has been keeping  
a few secrets from us.**



**SHARDS**

**THE PETTIGREW CHRONICLES**

**COMMODORE 64, SPECTRUM 48K**

# Stop the Express

If you have not already guessed from its name, the 1541 Express is a little "think fast" which allows you much greater access to your 1541 disk drive.

With this product your 64 can access and load files from the 1541 at about twice the normal speed. This saves you from the two- or three-minute lags in load time programs or files. The 1541 Express is marketed by Ram Electronics, and costs for \$89.95.

For your money you are supplied with a cartridge which plugs into the 64's cartridge port, and a three-manual 12-page set of instructions and explains use of the cartridge.

Before you can use the 1541 Express it is necessary to connect two wires from the cartridge, to two chips inside the 64. This means that the lid must be taken off the 64, which could void your warranty, so be warned!

## No hesitation

Having removed the lid on my 64 many times, there was no hesitation at the prospect of more prodding around inside. The two wires are labelled 4518 and U04, indicating the chips that the wires must be connected to. They both have a small gap on the end of the wire so that the connection is secure, but easily removable. The wire marked 4518 is connected to pin 28 of the processor, and the wire marked U14 is connected to pin 13 of the chip marked U14 on the chip itself. A nice touch is that marked U14, it's labeled on the board beside the chip, & is advisable to cut the

wire through the back of the 64 so that it can be closed properly!

There's no problem if the wires are connected in the wrong pins, the cartridge simply won't work and you will have to check the connections.

When you power up the 64 with the 1541 Express properly installed, you'll see three bars to the power up memory status of two. The normal line should give the product name and copyright message. The amount of RAM is not affected; there are still 384K bytes available.

The manual is the nice really looking, as it so often the case. However, this is a pre-production version. The manual is eight pages long, and the presentation is not nearly as professional as the product itself. The eight pages cover the installation of the cartridge, the operating instructions, functions of the cartridge, working with other peripherals and very few programmers' notes.

There could have been a great deal more explanation of the cartridge in general, and the problems that might occur in using it with other peripherals. A few demo programs with documentation would not have gone amiss, and certainly more information for programmers wishing to make greatest use of the cartridge and its facilities is a must.

Unlike the manual, using the cartridge is very simple and smooth. When the 64 is powered up with the 1541 Express installed, the two function keys F1 and F2 are set to toggle between fast and slow mode. In other words the normal disk access rate may be used with the cartridge in place by

pressing the 'CTRL' key and the 'F2' together, the screen will flash once quickly.

To get back to fast mode simply press 'CTRL' and 'F1' together, again the screen will flash once, although this operation takes a little longer. Holding down the 'SHIFT' key and pressing 'RUN-STOP' will load and run the F10 program on disk. The cartridge changes the default device to disk, saving the need for the 'J' files can simply be loaded as the basic `LI1541<<Escape><return>`

There is no need to enter the device number or close the quotes, and the usual abbreviations are accepted.

## Besttest results

Ram Electronics claims up to three or four times the usual access time. This is more like twice the speed on average. Here are some of the results from the benchmarks, giving normal times first then times with the cartridge:

Loading 10K program: 1 min. 24 sec. | 29 sec.

Saving 10K program: 1 min. 31 sec. | 1 min. 4 sec.

Loading 14K file: 1 min. 53 sec. | 1 min. 8 sec. (Preorder file)

Saving 14K file: 1 min. 32 sec. | 1 min. 8 sec. (Preorder file)

These tests are all approximate, but even so they do not actually amount to three times the normal speed. They do however make a huge improvement, particularly with normal programs, but even with files loaded and saved from a word processor. The 1541 Express will most, with love,



Steps. Forward, and, I am informed, most other soft-loaded word processors from the same disk access rate is as general as could be had.

Using other software such as editors and basic programs does not have any adverse effects. Even if a program does conflict, it is often possible to load and run it by switching to normal mode.

The 1240 normally objects to opening being on the screen while the disk is accessed, but not so with the cartridge inserted. You can display errors and still have access to the disk.

The cartridge covers one of the drive buffers, reducing the number of 512K OPPIN at any one time from 1 sequential, or 2 sequential and 2 relative files, to 2 sequential files or 4 relative files, in fact mode.

An RS-232 module may be used with the cartridge. This allows such downloading of programs. However, if you wish to have more data rate than is provided by the 64's serial port while using the 1240 Express, you will have problems, so it will only access one. So anyone with a 1240 and a printer connected to the serial bus or two 1241's will not be able to use the cartridge with more than one of these devices.

Ram says it is just about to market a cheap cable which will allow you to have two drives, or a printer and one drive, connected while using the cartridge in this mode. The cable will also have some other features — as yet no details, we shall have to wait and see.

The standard will give you the extra



features described below for "HOLD RUN" — STOP and default modes, whether in fact or normal mode. Depending on what power you are using and how it is connected, the cartridge may work in slow mode with your power. Two single drives may be connected with the cartridge installed, but only accessed in slow mode.

The code for the cartridge is written, the normal cartridge space is 16000 to 16111 hex, but upon examination there was nothing there. The space that normally occupies the ASC II code for the power-up message has some strange code and the area from 16100 hex onwards will not download. So for those who are curious, this should provide some challenges!

In conclusion, it's a shame about the manual it could have contained a lot more information and the programmer could

have been better. The extra drawback is, of course the lack of a cartridge port when using the 1241 Express, any cartridge you normally use, or wish to use, cannot be connected. It seems the only way around this is to buy an expansion board. Even then I am not sure if they would work together — perhaps Ram Electronics will clarify this at the next future.

The product is over all it claims to be and saves a lot of time if you use your 64 and 1240 daily. The general standard of the product is very high and I have no hesitation in recommending it, in fact since reviewing the 1240 Express I have purchased one myself. It is one of those products that you just have to have a copy of the price! ■

Kevin Bergin

## For work or play Voltmace has the answer!



**For play** The Delta 3sc keyboard is designed for the avidly sophisticated user. A fingertip sensitive keyboard designed to be used with the fingertips of the other hand. The entire slide switch keyboard is designed to allow maximum use of the fingertip and the flat buttons (in case of things) have been tested for millions of operations.



**For work** The Delta 16c — a sixteen key full travel keyboard for the Delta 16. Six play plugs into the face control panel. Complete with a cassette program to define the key characters. In operation just put on the shift lock. As usual keyboard.



**DELTA 16c**  
**DELTA 3sc ADVANCE**  
Prices include VAT and P&H



**DELTA 3sc**  
**DELTA 3sc**  
Serial interface to PC. Also  
**Voltmace Limited**  
Park Drive  
Baldock  
Herts  
SG7 6EH

# Voltmace datapad 16c & delta 3sc

Call us now on the 1600 — Monday to Friday    Dealer terms available    Telephone (0462) 554410

# THE FABULOUS CASSETTE



FROM

**cascade**

VALUE that's out of this world

## 50 GAMES ON ONE CASSETTE

NOW AVAILABLE FOR C...ommunications LTD ELECTRON ALPHAS  
 DYNAPAC DYN... Spectrum ... ATARI CNC-1 JAGUAR WPC 3D

**COMMODORE 64**  
 Once you can save money from downloading big floppy listings (no waiting for the magazine) you can save money the other way round. We've put 50 of our best GALLIC ATTACK! Join one of the great games on a one cassette pack. Featuring high resolution and some excellent graphics (with sound and music and more...)



50 GAMES AS SO AVAILABLE FOR THE 64

**WE PAY TOP PRICES FOR TOP QUALITY GAMES**

**EXPRESS DELIVERY ORDER NOW**

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Post Code: \_\_\_\_\_  
 City: \_\_\_\_\_  
 Dealer & Stockist enquiries welcome

Please send me by return of post **50 Games on 1 Cass** for the value I enclose + (Shipping cost for)

£ \_\_\_\_\_ made payable to Cascade Games Ltd

ORDERED BY:  YES NO  YES NO  YES NO  YES NO  
 (circle number) (circle number) (circle number) (circle number)

Cascade Games Ltd  
 Suite 4, 13 Ipswich County Hospital  
 West Thurrock, Essex S16 2JF  
 Telephone 0473 672522

CS 11/81

ATTENTION! ATTENTION! ATTENTION!

## ALL COMMODORE 64 USERS

Now your computer can keep track of all your Money, Telephone Numbers & Addresses too!

And in the midst of a business, you can very fast access to the information in the DATA BASE, you have created.

Thanks to ADDRESS PAD 64

Available only on cassette

Data storage is on cassette

### FEATURES

- \* Editing facility
- \* Fully protected
- \* Help function
- \* Automatic locking for file security

Make cheques - postal orders for £5-50 made payable to DYNAMITE SOFTWARE Ltd, post to: 19 PARKFIELD

SURAB, LONDON NW4 9JZ

Please include POST & PACKING (UK ONLY)

NAME  
 ADDRESS

POST CODE  
 Please allow 21 days delivery

**ZOOM PARCEL** Powerful streamer of computer software £1500 and 10000 floppy disks (also tapes etc) including the whole contents of the 10720

**RAMBAMBA 8.4** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

**ALPHAS 84** The first ever... £45.00

All prices are **DISC RATE** - amounts shown include postage

All programs are **DATA BASE** - for the full version

CALL 0473 672522 or 0473 672523

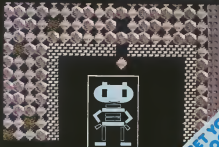
### DYNAMITE SOFTWARE

8CM 5713, LONDON WC1N 3BX



# BIGGER, BOULDER, <sup>More</sup> BEAUTIFUL AMERICAN NO 1.

75+05 00 138 000005



86 LEVELS

GET YOUR  
ROCKS  
OFF



## Boulder Dash

COMMODORE  
64



CASSETTE 8-95

DISK 10-95



State Soft Ltd  
Business & Technology Centre  
Bessmer Drive, Stevenage  
Hertfordshire SG1 2DY  
Phone (0438) 316661



*Really Something Else*

# BEYOND

CHALLENGING SOFTWARE

Now available on Commodore 64

Less than human, for more than mere computer

The Psytronoids are massive 8-in-1 machines. Following their own, small logic with deft, precise accuracy which would leave a human brain wondering, computer program controlled. Derogatory members of the team would be possessed and its effect on the fabric of the machine calculated automatically. Human lives will be expended as necessary but if the Psytron ever goes down.

The Spectrum top seller now comes on the Commodore 64 and another platform.

## PSYTRON PSYTRON

Stunning graphics, animation which makes other programmers gasp, a 20 page booklet of hints and tips and help with the discovery of each of six levels of play

Both formats now available at all good computer game shops

# Drive faster!



There's nothing worse than waiting for your program to load. And good though the Commodore 1541 is, speed isn't exactly its biggest feature.

Hook up the new 1541 Express from RAM, though, and you'll be up and running like lightning.

The ingenious add-on speeds up data transfer from the 1541 and new 1542 disk drives to your Commodore 64. So much so, that you'll wonder how you ever found the patience to wait before.

With the Express you compile programs in a third of the normal time. That means less frustration and less time wasted (You can't fit yourself in minutes, too - and disconnect it just as easily.)

The new 1541 Express from RAM

To shift your drive into top gear call to your nearest dealer today.

There's nothing worse than waiting for your program to load. And good though the Commodore 1541 is, speed isn't exactly its biggest feature.

Or call our credit card hot line on 02594 25252 (Access and Visa welcome).

Or complete the coupon below and send it today to Dept CH (Ram Electronics (Pvt) Ltd, 126 Fleet Road, Fleet, Hampshire, GU13 9PA.

34 p/h despatch for credit cards and postal orders.

#### Please send me

\_\_\_\_\_ 1541 Express High-Speed Disk Loading Card(s) at **£99.95** + £1.50 p/h despatch (UK only)

\_\_\_\_\_ (unless checked/postal order or cheque. Access/Visa for all)



Name \_\_\_\_\_

Address \_\_\_\_\_

Post Code \_\_\_\_\_

By \_\_\_\_\_

© 1987 RAM Electronics (Pvt) Ltd. All rights reserved. RAM is a registered trademark.

Trade and export enquiries welcome.





# Speak and spell with Currah's little chatterbox

David Fox strikes up a conversation with the Currah Speech 64 voice synthesizer

AS A PRELUDE to a full review of speech synthesis and voice recognition hardware, which will appear in the New Year, this is a brief look at one of the more interesting speech synthesizers on the market — the Speech 64 from Currah.

Currah's Microscope for the Sinclair Spectrum was highly praised, sold in thousands, and led to many software houses incorporating it into games. The Speech 64 is an improved version of this unit, and works on the same basic principle.

Human speech can be received into several easy words known as allophones. Rather than limit the range of a speech synthesizer by programming it to reproduce a small number of words (usually digitally from PROMs) — Programmable Read Only Memory Chips — Currah chose to reproduce allophones and leave it to the individual to combine them into whatever vocabulary was required. To be more clear, you can program Speech 64 to say anything you want it to, though it will sound fairly mechanical — but this adds to the fun, I feel.

## Advances

The Speech 64 plugs into the cartridge port and an DIN plug goes into the video/voice socket. Entering INT1 will activate the system, which will print an additional copyright message on the screen.

The Speech 64 plugs into the cartridge port and an DIN plug goes into the video/voice socket. Entering INT1 will activate the system, which will print an additional copyright message on the screen.

Any key pressed will then be "spoken" (depending on how you set TV volume).

One great advance incorporated into Speech 64 is that it can speak in a variety of voices — low or high pitch or without inflection.

This has great potential for game games, especially adventures where different characters could be given suitable differing voices. Key settings can be changed with SCRP, though for clarity programmers it could be a boon. All these advances contribute can be recognized into Basic too.

## Allophones

There are two methods of entering speech — in ordinary English (or for that

matter any other language you require) preceded by a SAY command, or in allophone form, combining the 36 available allophones for most precise results.

The Speech 64's int-to-speech converter is incredibly impressive, and nothing like it has been available for the Commodore before now. The unit's operating system even includes a "lookup table" which takes care of words with non-standard int-to-speeches like "through". Well, it is possible to make it pronounce some words oddly, so that is where the allophones form comes in handy — though it takes a little getting used to.

## Bugs

Let's try a little allophone composition "Welcome to the United States" would be entered allophonically as "wɛlkwɛm tʊdɪz ɪnɪtɪd stɪts". However when you look at it:

Speech in the speech unit be produced using standard pronunciation, and if you make an error — enter a bad int-to-allele phrase — you'll get an error message. Normal text and allophones can be mixed

in a SAY statement by enclosing the allophones in square brackets.

Upper case gives higher intonation, so in effect Speech 64 can produce four voices in different pitches. Lower programming can also reproduce different accents and character tones.

Speech 64 doesn't slow down the execution of programs, even it includes a "buffer" which speeds information in stored and released in a standard rate. If you STOP a program the buffer is emptied — otherwise you might leave 30 seconds of unwanted speech.

## Examples

The comprehensive handbook shows that it's much easier to program Speech 64 in ordinary code than it is in Basic. However, I doubt whether it will prove any difficult to a experienced programmer. Full details are given of how to enhance int-to-speeches to a number of modes, and there's an example basic program — a speaking clock using the 64's internal TR.

## At a price

All in all the four voices, int-to-speech converter and low price — £29.95 — of the Speech 64 make it seem serious for business. Other attempts by various companies, including Commodore itself, to introduce speech synthesizers, have failed due to a lack of software support and marketing know-how. Currah, it seems will be making no such mistake. Already announcements are being carried out with a number of big software companies to produce Speech 64 compatible games — Amongst PC users should be the first set of it's success, it may well be the first of a long line of talking games which will exploit the capabilities of Currah's excellent product to the full. ■



Currah's Speech 64 — four voices and int-to-speech speech

# COMMODORE SOFTWARE FILE

## Paralander

Paralander is a two-stage game. In the first section you must lead 10 paratroopers safely on the morning rifts before the fire begins to drop a parachute from your bomber. Random commands make life difficult.

In screen two you must coordinate your bomber with a Paratrooper, but you can lose

a life if you collide with a cloud. You reach the bottom of the screen without reloading, or saved the 30 second time limit, which decreases by 1 second on each attempt. Avoid a 'no' just 2. Type in all keys or you may encounter UNDEF'D STATEMENT errors.

```

30: 909447: 9473298: 2475281: 79477: 6704812377.
31: L4T: 24490
44: 944: L240: L370
104: 821: ***** STAGE 1 *****
107: 9456: 9479: PORE420: 1: PORE429: 1: 10: 414: P409
108: PP: DIT: 081
107: PP: DIT: 409999 ***** OCCURS 24 times L2-L3
114: PORE2040: 134: PORE20: 1: 100: P40E2040: 194: P40E2040: 194: P40E2044: 124: P40E2045: 19
4
118: P40E2045: 134: NEB7040
126: P409407040: P40940: P40E122040+4: 0: NE4T
127: P409407040: P40940: P40E122040+6: 0: NE4T
128: P409407040: P40940: P40E1243040: 0: NE4T
129: P409407040: P40940: P40E1243040: 0: NE4T
129: P409407040: P40940: P40E1243040: 0: NE4T
130: P409407040: P40940: P40E1243040: 0: NE4T
131: P409407040: P40940: P40E1243040: 0: NE4T
132: P409407040: P40940: P40E1243040: 0: NE4T
133: P409407040: P40940: P40E1243040: 0: NE4T
134: P409407040: P40940: P40E1243040: 0: NE4T
135: P409407040: P40940: P40E1243040: 0: NE4T
136: P409407040: P40940: P40E1243040: 0: NE4T
137: P409407040: P40940: P40E1243040: 0: NE4T
138: P409407040: P40940: P40E1243040: 0: NE4T
139: P409407040: P40940: P40E1243040: 0: NE4T
140: P409407040: P40940: P40E1243040: 0: NE4T
141: P409407040: P40940: P40E1243040: 0: NE4T
142: P409407040: P40940: P40E1243040: 0: NE4T
143: P409407040: P40940: P40E1243040: 0: NE4T
144: P409407040: P40940: P40E1243040: 0: NE4T
145: P409407040: P40940: P40E1243040: 0: NE4T
146: P409407040: P40940: P40E1243040: 0: NE4T
147: P409407040: P40940: P40E1243040: 0: NE4T
148: P409407040: P40940: P40E1243040: 0: NE4T
149: P409407040: P40940: P40E1243040: 0: NE4T
150: P409407040: P40940: P40E1243040: 0: NE4T
151: P409407040: P40940: P40E1243040: 0: NE4T
152: P409407040: P40940: P40E1243040: 0: NE4T
153: P409407040: P40940: P40E1243040: 0: NE4T
154: P409407040: P40940: P40E1243040: 0: NE4T
155: P409407040: P40940: P40E1243040: 0: NE4T
156: P409407040: P40940: P40E1243040: 0: NE4T
157: P409407040: P40940: P40E1243040: 0: NE4T
158: P409407040: P40940: P40E1243040: 0: NE4T
159: P409407040: P40940: P40E1243040: 0: NE4T
160: P409407040: P40940: P40E1243040: 0: NE4T
161: P409407040: P40940: P40E1243040: 0: NE4T
162: P409407040: P40940: P40E1243040: 0: NE4T
163: P409407040: P40940: P40E1243040: 0: NE4T
164: P409407040: P40940: P40E1243040: 0: NE4T
165: P409407040: P40940: P40E1243040: 0: NE4T
166: P409407040: P40940: P40E1243040: 0: NE4T
167: P409407040: P40940: P40E1243040: 0: NE4T
168: P409407040: P40940: P40E1243040: 0: NE4T
169: P409407040: P40940: P40E1243040: 0: NE4T
170: P409407040: P40940: P40E1243040: 0: NE4T
171: P409407040: P40940: P40E1243040: 0: NE4T
172: P409407040: P40940: P40E1243040: 0: NE4T
173: P409407040: P40940: P40E1243040: 0: NE4T
174: P409407040: P40940: P40E1243040: 0: NE4T
175: P409407040: P40940: P40E1243040: 0: NE4T
176: P409407040: P40940: P40E1243040: 0: NE4T
177: P409407040: P40940: P40E1243040: 0: NE4T
178: P409407040: P40940: P40E1243040: 0: NE4T
179: P409407040: P40940: P40E1243040: 0: NE4T
180: P409407040: P40940: P40E1243040: 0: NE4T
181: P409407040: P40940: P40E1243040: 0: NE4T
182: P409407040: P40940: P40E1243040: 0: NE4T
183: P409407040: P40940: P40E1243040: 0: NE4T
184: P409407040: P40940: P40E1243040: 0: NE4T
185: P409407040: P40940: P40E1243040: 0: NE4T
186: P409407040: P40940: P40E1243040: 0: NE4T
187: P409407040: P40940: P40E1243040: 0: NE4T
188: P409407040: P40940: P40E1243040: 0: NE4T
189: P409407040: P40940: P40E1243040: 0: NE4T
190: P409407040: P40940: P40E1243040: 0: NE4T
191: P409407040: P40940: P40E1243040: 0: NE4T
192: P409407040: P40940: P40E1243040: 0: NE4T
193: P409407040: P40940: P40E1243040: 0: NE4T
194: P409407040: P40940: P40E1243040: 0: NE4T
195: P409407040: P40940: P40E1243040: 0: NE4T
196: P409407040: P40940: P40E1243040: 0: NE4T
197: P409407040: P40940: P40E1243040: 0: NE4T
198: P409407040: P40940: P40E1243040: 0: NE4T
199: P409407040: P40940: P40E1243040: 0: NE4T
200: P409407040: P40940: P40E1243040: 0: NE4T
201: P409407040: P40940: P40E1243040: 0: NE4T
202: P409407040: P40940: P40E1243040: 0: NE4T
203: P409407040: P40940: P40E1243040: 0: NE4T
204: P409407040: P40940: P40E1243040: 0: NE4T
205: P409407040: P40940: P40E1243040: 0: NE4T
206: P409407040: P40940: P40E1243040: 0: NE4T
207: P409407040: P40940: P40E1243040: 0: NE4T
208: P409407040: P40940: P40E1243040: 0: NE4T
209: P409407040: P40940: P40E1243040: 0: NE4T
210: P409407040: P40940: P40E1243040: 0: NE4T
211: P409407040: P40940: P40E1243040: 0: NE4T
212: P409407040: P40940: P40E1243040: 0: NE4T
213: P409407040: P40940: P40E1243040: 0: NE4T
214: P409407040: P40940: P40E1243040: 0: NE4T
215: P409407040: P40940: P40E1243040: 0: NE4T
216: P409407040: P40940: P40E1243040: 0: NE4T
217: P409407040: P40940: P40E1243040: 0: NE4T
218: P409407040: P40940: P40E1243040: 0: NE4T
219: P409407040: P40940: P40E1243040: 0: NE4T
220: P409407040: P40940: P40E1243040: 0: NE4T
221: P409407040: P40940: P40E1243040: 0: NE4T
222: P409407040: P40940: P40E1243040: 0: NE4T
223: P409407040: P40940: P40E1243040: 0: NE4T
224: P409407040: P40940: P40E1243040: 0: NE4T
225: P409407040: P40940: P40E1243040: 0: NE4T
226: P409407040: P40940: P40E1243040: 0: NE4T
227: P409407040: P40940: P40E1243040: 0: NE4T
228: P409407040: P40940: P40E1243040: 0: NE4T
229: P409407040: P40940: P40E1243040: 0: NE4T
230: P409407040: P40940: P40E1243040: 0: NE4T
231: P409407040: P40940: P40E1243040: 0: NE4T
232: P409407040: P40940: P40E1243040: 0: NE4T
233: P409407040: P40940: P40E1243040: 0: NE4T
234: P409407040: P40940: P40E1243040: 0: NE4T
235: P409407040: P40940: P40E1243040: 0: NE4T
236: P409407040: P40940: P40E1243040: 0: NE4T
237: P409407040: P40940: P40E1243040: 0: NE4T
238: P409407040: P40940: P40E1243040: 0: NE4T
239: P409407040: P40940: P40E1243040: 0: NE4T
240: P409407040: P40940: P40E1243040: 0: NE4T
241: P409407040: P40940: P40E1243040: 0: NE4T
242: P409407040: P40940: P40E1243040: 0: NE4T
243: P409407040: P40940: P40E1243040: 0: NE4T
244: P409407040: P40940: P40E1243040: 0: NE4T
245: P409407040: P40940: P40E1243040: 0: NE4T
246: P409407040: P40940: P40E1243040: 0: NE4T
247: P409407040: P40940: P40E1243040: 0: NE4T
248: P409407040: P40940: P40E1243040: 0: NE4T
249: P409407040: P40940: P40E1243040: 0: NE4T
250: P409407040: P40940: P40E1243040: 0: NE4T
251: P409407040: P40940: P40E1243040: 0: NE4T
252: P409407040: P40940: P40E1243040: 0: NE4T

```

```

564 PRINT "*****"
565 PRINT "*****"
570 PRINT "*****"
575 PRINT "*****"
580 PRINT "*****"
585 PRINT "*****"
590 PRINT "*****"
600 PRINT "*****"
605 PRINT "*****"
610 PRINT "*****"
615 PRINT "*****"
620 PRINT "*****"
625 PRINT "*****"
630 PRINT "*****"
635 PRINT "*****"
640 PRINT "*****"
645 PRINT "*****"
650 PRINT "*****"
655 PRINT "*****"
660 PRINT "*****"
665 PRINT "*****"
670 PRINT "*****"
675 PRINT "*****"
680 PRINT "*****"
685 PRINT "*****"
690 PRINT "*****"
695 PRINT "*****"
700 PRINT "*****"
705 PRINT "*****"
710 PRINT "*****"
715 PRINT "*****"
720 PRINT "*****"
725 PRINT "*****"
730 PRINT "*****"
735 PRINT "*****"
740 PRINT "*****"
745 PRINT "*****"
750 PRINT "*****"
755 PRINT "*****"
760 PRINT "*****"
765 PRINT "*****"
770 PRINT "*****"
775 PRINT "*****"
780 PRINT "*****"
785 PRINT "*****"
790 PRINT "*****"
795 PRINT "*****"
800 PRINT "*****"
805 PRINT "*****"
810 PRINT "*****"
815 PRINT "*****"
820 PRINT "*****"
825 PRINT "*****"
830 PRINT "*****"
835 PRINT "*****"
840 PRINT "*****"
845 PRINT "*****"
850 PRINT "*****"
855 PRINT "*****"
860 PRINT "*****"
865 PRINT "*****"
870 PRINT "*****"
875 PRINT "*****"
880 PRINT "*****"
885 PRINT "*****"
890 PRINT "*****"
895 PRINT "*****"
900 PRINT "*****"
905 PRINT "*****"
910 PRINT "*****"
915 PRINT "*****"
920 PRINT "*****"
925 PRINT "*****"
930 PRINT "*****"
935 PRINT "*****"
940 PRINT "*****"
945 PRINT "*****"
950 PRINT "*****"
955 PRINT "*****"
960 PRINT "*****"
965 PRINT "*****"
970 PRINT "*****"
975 PRINT "*****"
980 PRINT "*****"
985 PRINT "*****"
990 PRINT "*****"
995 PRINT "*****"

```

# 3D COMPUTERS

THE HOME COMPUTER SPECIALISTS

Easy Parting at all branches

with more branches than any other Computers specialist dealer we offer **ONE STOP SHOPPING** For you

# 3D

call at your local branch for friendly advice and service



## SOFTWARE

All the best sellers from the top UK and U.S.A software houses, eg. LLAMASOFT DATASOFT EPIX INFOCOM RASBIT INTERCEPT SUPERSOFT ON LINE ABRASCO

## TOLWORTH

200 Tolworth Bus Court  
Tolworth Surrey,  
Surrey KT8 9NB  
Tel: 01 227 6317

## SUTTON

30 Station Road  
Selmore Sutton  
Surrey SM2 6SS  
Tel: 01 442 2634

## LELAND

114 Conventry Avenue  
Ealing London W5 4NF  
Tel: 01 442 5455

## BECKENHAMWORTH

Colwyns Walks  
The Green, Coulsley Green,  
Beckenhamwath  
Kent, WGS 3AJ  
Tel: 06223 77920

## NEWBURY

20 Reading Road  
Newbury  
Berks, RG14 2PQ  
Tel: 06083 30047

## LUTON

1 Manor Road  
Cottonston Luton  
 Beds LU2 8JF  
Tel: 05821 46672

## PERIPHERALS

DISCS  
PRINTERS  
JOYSTICKS  
MONITORS B/W/  
COLOUR  
LIGHTPEN  
C8M CASSETTE DECKS

LARGE RANGE OF BOOKS  
BOOKS TITLES CASSETTES &  
PRINTED MANUALS AT 50% DISC  
PRICE



See a complete display of hardware and software to build up your 3D system

NEW
PRODUCTS For the Commodore
NEW

### CBM64

280K RAM  
1541 Disk Drive  
1542 Disk Drive  
1543 Disk Drive  
1544 Disk Drive  
1545 Disk Drive  
1546 Disk Drive  
1547 Disk Drive  
1548 Disk Drive  
1549 Disk Drive  
1550 Disk Drive  
1551 Disk Drive  
1552 Disk Drive  
1553 Disk Drive  
1554 Disk Drive  
1555 Disk Drive  
1556 Disk Drive  
1557 Disk Drive  
1558 Disk Drive  
1559 Disk Drive  
1560 Disk Drive  
1561 Disk Drive  
1562 Disk Drive  
1563 Disk Drive  
1564 Disk Drive  
1565 Disk Drive  
1566 Disk Drive  
1567 Disk Drive  
1568 Disk Drive  
1569 Disk Drive  
1570 Disk Drive  
1571 Disk Drive  
1572 Disk Drive  
1573 Disk Drive  
1574 Disk Drive  
1575 Disk Drive  
1576 Disk Drive  
1577 Disk Drive  
1578 Disk Drive  
1579 Disk Drive  
1580 Disk Drive  
1581 Disk Drive  
1582 Disk Drive  
1583 Disk Drive  
1584 Disk Drive  
1585 Disk Drive  
1586 Disk Drive  
1587 Disk Drive  
1588 Disk Drive  
1589 Disk Drive  
1590 Disk Drive  
1591 Disk Drive  
1592 Disk Drive  
1593 Disk Drive  
1594 Disk Drive  
1595 Disk Drive  
1596 Disk Drive  
1597 Disk Drive  
1598 Disk Drive  
1599 Disk Drive  
1600 Disk Drive

### PRODUCTS For the VIC20

280K RAM  
1541 Disk Drive  
1542 Disk Drive  
1543 Disk Drive  
1544 Disk Drive  
1545 Disk Drive  
1546 Disk Drive  
1547 Disk Drive  
1548 Disk Drive  
1549 Disk Drive  
1550 Disk Drive  
1551 Disk Drive  
1552 Disk Drive  
1553 Disk Drive  
1554 Disk Drive  
1555 Disk Drive  
1556 Disk Drive  
1557 Disk Drive  
1558 Disk Drive  
1559 Disk Drive  
1560 Disk Drive  
1561 Disk Drive  
1562 Disk Drive  
1563 Disk Drive  
1564 Disk Drive  
1565 Disk Drive  
1566 Disk Drive  
1567 Disk Drive  
1568 Disk Drive  
1569 Disk Drive  
1570 Disk Drive  
1571 Disk Drive  
1572 Disk Drive  
1573 Disk Drive  
1574 Disk Drive  
1575 Disk Drive  
1576 Disk Drive  
1577 Disk Drive  
1578 Disk Drive  
1579 Disk Drive  
1580 Disk Drive  
1581 Disk Drive  
1582 Disk Drive  
1583 Disk Drive  
1584 Disk Drive  
1585 Disk Drive  
1586 Disk Drive  
1587 Disk Drive  
1588 Disk Drive  
1589 Disk Drive  
1590 Disk Drive  
1591 Disk Drive  
1592 Disk Drive  
1593 Disk Drive  
1594 Disk Drive  
1595 Disk Drive  
1596 Disk Drive  
1597 Disk Drive  
1598 Disk Drive  
1599 Disk Drive  
1600 Disk Drive

# zero

FREE ELECTRONICS  
ON REQUEST ONLY  
CALL US TODAY 0444 542029  
TELEPHONE 0444 542029





**SECURITYVEL** HOME SECURITY & CONTROL INTERFACE FOR COMMERCIAL 64 & VIC 20 COMPUTERS



**SECURITYVEL INTERVIEW LOG UNIT**

- 128K MEMORY (128K TO 512K MEMORY NOT SUPPLIED)
- 100% RELIABLE
- 100% COMPATIBLE
- 100% SECURE
- 100% EASY TO USE
- 100% AFFORDABLE
- 100% SUPPORT
- 100% GUARANTEE
- 100% SATISFACTION
- 100% MONEY BACK

**SECURITYVEL CONTROL PROGRAM**

- 128K MEMORY (128K TO 512K MEMORY NOT SUPPLIED)
- 100% RELIABLE
- 100% COMPATIBLE
- 100% SECURE
- 100% EASY TO USE
- 100% AFFORDABLE
- 100% SUPPORT
- 100% GUARANTEE
- 100% SATISFACTION
- 100% MONEY BACK

SECURITYVEL INTERVIEW LOG UNIT and CONTROL PROGRAM are available in a single package for £199.95 (incl. VAT) or £149.95 (incl. VAT) for the interview log unit only. The control program is available separately for £49.95 (incl. VAT).

**SECULAR ALARM SYSTEM**

- 128K MEMORY (128K TO 512K MEMORY NOT SUPPLIED)
- 100% RELIABLE
- 100% COMPATIBLE
- 100% SECURE
- 100% EASY TO USE
- 100% AFFORDABLE
- 100% SUPPORT
- 100% GUARANTEE
- 100% SATISFACTION
- 100% MONEY BACK

Complete kit £199.95 (incl. VAT)

**SECURE SECURITY**

128K Memory £149.95 (incl. VAT)  
 512K Memory £199.95 (incl. VAT)

**DOCTADISK**

SUFFERED ANY OF THESE AILMENTS LATELY???



- 1) SUFFERED DATA LOSS
- 2) TRASHED DATA
- 3) FILES IN ORDER BUT NOT RECOVERABLE DATA
- 4) BLANK DISKETS OR DISKS
- 5) PREVENTED DATA LOSS

CALL US TODAY FOR THE ONLY DISK DOCTADISK TO HELP PREVENT FURTHER MISADVENTURES

- FEATURES:**
- YOUR DATA'S PROTECTED ANYTIME
  - EASY TO USE TO RECOVER DATA IN A MINUTE
  - EASY TO USE AND OPERATIONAL SECURITY
  - YOURS TO USE AND YOURS TO KEEP
  - EASY TO USE FOR THE BEST PROTECTION
  - EASY TO USE FOR THE BEST PROTECTION
  - EASY TO USE FOR THE BEST PROTECTION
  - EASY TO USE FOR THE BEST PROTECTION

HERALD SOFTWARE, 27 Southampton Gardens, Colchester, Essex CO1 1AB  
 Tel: 0206 881 2200 Telex: 933074 ELACOL G  
 0206 950 0800

**PROGRAMMIST:** Contact us if you have any interesting proposals. We would like to hear from you.

Attention - all Commodore 64 owners with a 1541 disk drive

**MPS TOOLKIT**

- Single Drive 3-Pass Disk Backup — of individual tracks
- File Copy — transfer any number of files at once up to 255 blocks long
- Disk Error Locator — vital device for proper backups: 500's & 8's counting, with printer output
- Disk Error Mapper — makes 26, 31, 32 & 33 errors necessary for proper backup of protected disks
- Disk Drive Monitor — address the drive's internal ROM & RAM
- Disk Doctor — dozens of uses, read and change sectors, recover lost data
- DOS Changer — Protect your own disks
- Disk Log — displays all files on a disk, including start & end address, beginning track and sector with printer option
- Loading Address Reflector — Disk Test
- File Recovery — Compaq
- Plus many more useful features!

Owners of unformatted MPS TOOLKIT is the only disk utility for sale in the UK which includes all this at such a low price. Comes complete with instructions on tape 12 000

Only £14.95 including P&P  
 For order only, please call 01 60  
 word direct or £ 2 to  
 MPS SOFTWARE  
 28 ALEXANDRA GROVE, London W12 9LP  
 Telephone: 01 600 3482

**The Adventure for Children**



Help Humpty Dumpty and many other Nursery Rhyme characters as you explore the countryside. This new adventure game by Judy Rogers has been written for the £ 999 94 computer for children aged 5 to 12 with moving screens, 400 pictures for story locations and over 1000 correct spellings. Ask at your local dealer of COM 64 software or order on the form below.

Please send me  cassette at £5.95  
 diskette at £9.95  
 I enclose cheque/£ 0 payable to

**Judy Rogers**  
 19 Cranston Ave., Northfleet, Kent DA11 6QT  
 Tel: (0432) 312809

Name \_\_\_\_\_  
 Address \_\_\_\_\_



## Lack of description

**Book:** *Commander 64 Games*  
**Author:** Kevin Boyce  
**Publisher:** Dorland  
**Cost:** £5.95

**Reviewer:** C. P. Woodcock

There is a book of 200 programs — some games, some utilities. Each is presented as a listing with comments about how the program works in the most fulsome that can be seen in many of the computer magsazines, eg *Let's — Let's Y* "Get up, commander! While the format may be acceptable in some instances, I think that a book written along these lines should be more descriptive. In some cases, in this book, large sections of the program are completely ignored.

Amongst the offerings are a Snake game, Draughts, Civilization, Hangman and the obligatory "Doc Muncher". The authors are so much excited by the graphics, block graphs, Code monitor, User base and Tape access.

As one of my purposes in listing, it was pleased to see a program which allows the keyboard to be used to play music. One is also able to change most of the speed parameters. But the result was disappointing. Also, the program will not work at all speeds — my knowledge of the C64 64 comes handy a program line of 48 characters.

1500 Kenos Brian explains that the program will work if characters are released in all lines greater than 88 characters.

At 22:00 that represents about 1/3 of a program. For that sort of money you wouldn't expect too much. For anyone wanting good games, you would do better spending the money on the "real thing" and anyone wishing to learn something about programming would get better value and gain as much knowledge from half a dozen computer magazines.

## Structured programs

**Book:** *Commander 64*  
**Author:** Philip Williams  
**Publisher:** Conway

**Williams House**  
**Cost:** £3.95

**Reviewer:** Phil Boyce

THIS VERY illustrating structure appears on the cover of this book which differs from an otherwise needless volume. The first of these is the table, as the one contains very little which would not apply equally well to almost any other home computer. The only specific reference to Commodore machines comes in the appendices, which include brief instructions on handling C64 programs and setting the function keys in Basic programs.

The second and more glaring

lack occurs in the back-cover table, which shows that the book "makes full use of the machine's sound and graphics capabilities". In fact the book makes no attempt whatever to do either! The Basic commands is not even mentioned. So, what does the book try to do?

Its aim is to teach the beginner structured Basic programming and good programming habits, and this is achieved very well. It is clear and concise, working through all the fundamental Basic commands logically, with use of flow charts, and including up to an dozen listings for a Memo/ Imperial conversion

program. Finally, a concluding paragraph in each detail and makes brief mention of arrays and other commands.

The style of the book is unswerving without being boring, and avoids the pitfall of leading the reader as if to walk halfway to victory. Philip Williams has provided a thoroughly home-vector for the person who wishes to learn to program properly. He has not set out to provide too much substance for Commodore's User's Guide.

The book is attractively produced and represents excellent value for money at £3.95.

## Vic20 giant book of games lives up to its title

**Book:** *Giant Book of Games for Your Vic 20*  
**Author:** P. Hartnell, A. Book and A. Young  
**Publisher:** Prentice  
**Price:** £12.95  
**Reviewer:** David Shepherdson

THIS excellent book contains 41 programs for the unexpanded Vic 20 for the unexpanded and one for a Vic with Super Expander and Printer/Plotter. All the programs are accompanied by an explanation book of how to enter and how to play at each.

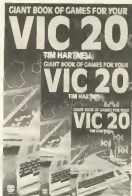
They are all clumped from a 1200 Printer/Plotter so all are one to read and enter. Some include Machine Code routines and User Defined Graphics they range from simple games like "Catch the Animals" type to sophisticated two-person like "Duckety King". There are adventures and strategy games and a few Utility programs like Big Letters, Tap! Phones and Print. For the +100 Vic authors set about the games and is a "War" game simulation, *Three Flies* (which is a simple four player game), *Power Dark II*, and *300 Vic-Vic-Tac*, and the Vic plays a very good game!

There is also a chapter on LDCs, which gives a very clear explanation on how to load disks and use them. The authors themselves give you ideas on how to enter the programs while the book, like there is a section on games you might like to consider writing a computer program for, adds some reading and a Glossary. Not the most type where the

names characters are listed, but one where definitions are given. For instance, but you are based at Vic20, well, we use the default system 000, characters are letters (2) and hex (16) and find a number of system using how?

The book itself is well

bound, well thought out and it would recommend a far any one who enjoys good playing and programming on the Vic 20 will have fun making the program and seeing how some ideas could be used in your own programs. Well worth the price.





80K  
DORCAS  
SOFTWARE  
Presented

# The Oracle's Cave

AN AMAZING  
ADVENTURE GAME  
WITH ANIMATED  
GRAPHICS  
FEATURING:

- A completely new and exciting location and several adventures to make the evening great.
- A new kind of magic to help you solve your problems.
- Excitingly animated full-resolution graphics and text.
- An all-new animated dragon that breathes fire and has 10 levels of health that makes you experience the full range of the battle.

The Oracle's Cave is a new and exciting location with several adventures to make the evening great. A new kind of magic to help you solve your problems. Excitingly animated full-resolution graphics and text. An all-new animated dragon that breathes fire and has 10 levels of health that makes you experience the full range of the battle.

Coming  
Soon

AVAILABLE FOR  
**COMMODORE 64**  
AND  
**SPECTRUM 48K**  
Control from leading publishers

Formerly  
DORCAS SOFTWARE  
We have changed our name to  
**DORCAS SOFTWARE**  
to avoid confusion with other  
companies and everywhere  
you can order the  
high quality of our products  
and services. Will remain  
the same.

## \*THE RUNES OF ZENDOS

18 adventures in one game with even more  
animation, problem solving, full sentence input  
and other exciting features

FOR THE 48K SPECTRUM

Available on cassette from  
THE ORACLE'S CAVE  
18 ADVENTURES IN ONE GAME  
AND OTHER EXCITING FEATURES  
CONTROL FROM  
DORCAS SOFTWARE  
3 VINE DALES, CHELSEA  
LONDON SW3 2DF  
Tel: 0779 128741  
Postage & Packing Free



# Halley's comet competition

**HALLEY'S COMET** is coming! And although there's no danger of it hitting our planet, this famous space tourist will be visible from east to west over 1986.

To make sure you get the best view possible, we're offering one lucky winner the chance to win a fantastic Prize Astral 400 telescope from Orion, which retails at 299.00.

The Astral 400 has a magnification of up

to 200X, and comes complete with dual 20mm eyepieces, a Barlow lens, a sighting ring and diagonal prism and an adjustable tripod with bag.

It's one of the successful Astral range which starts with the Astral 80 at £39.99, and goes up to the Astral 300 at £299.99. All you have to do is win a program for the Commodore 64 or the ZX Spectrum (we'll send you a digital representation of the image of Halley's comet around the sun, as all your artistic capabilities at the computer. This complex file is available in an art and assembly language in 15 words or less. It's sure to win an Astral telescope from Orion forever.

Eclipse Software of 79 Andrews Gardens, Worcester Park, Surrey, is producing a Commodore 64 version of the Spectrum program *Halley's Comet*, by Stephen Barber and astronomer Maurice Davis.

For more information on the comet try the astronomy section of your local library or the Junior Astronomical Society c/o Paul Sutherland, 18 Church Road, Putney, London.

Send your program on tape together with your name and address and you're completed

for inclusion in Orion's Telescope Competition, Commodore Hardware, 12/13 Little Newport Street, London WC2E 8JD. Entries a card if you'd like your tape returned.

The closing date is the last working day of November. Normal competition rules apply, and the winner will be announced in the January issue.



For your COMMODORE

# Guthbert 88 Friends the Tombs of Doom

£6.95



Our intrepid hero's BACK.  
In his latest action  
packed adventure!



## INDICATORI

- ★ **THE FOUR DIMENSIONS** in the High Revolution Graphics
- ★ **My Clie Manual** to help you on the way
- ★ **King Lines** which do what the books
- ★ **CRASHBROS** in great abundance
- ★ **MAPS & CLUES** so you don't get lost

Remember that you have  
30 DAYS!

Mail Order Sales from  
Microdeal Mail Order - 41 Truro Rd,  
St Austell Cornwall PL20 5AE

Credit Card Sales     
Phone 0728 73458



Dealers Contact  
**MICRODEAL DISTRIBUTION**  
0728-73458  
or WESTERN SOFTWARE  
0483 80828

# MICRODEAL

Special Microdeal Titles available from computer dealers nationwide or from larger branches of





# One person alone could go with Pitfall Harry into the Lost Caverns... You!



Running on Commodore 64, Sinclair Spectrum & MSX Systems at your local software store

Oh Harry! This time he's gone too far. Somewhere, buried deep in the lost caverns of Machu Pichu, Peru, lies the stolen and, of course, priceless Ray Diamond, along with a hoard of missing gold bars.

Harry's little niece Rhonda and Quickclaw her cowardly cat, are supposed to be with him, but they strayed away and are lost in the bowels of the caves.

A wealthy university has asked him, while he's clearing this mess up, to capture an elusive stone-age cave rat.

What fun.

He just has to avoid the occasional poisonous frog.

Oh yes. And the wickedly clawed condors.

The electric eels. And a very nasty line in thirsty vampire bats.

So you can see Harry could do with some help. All you'll have to help you are your wits and some gas-filled balloons to bridge the wider chasms. And you'll be in for the game of your life.

One thing puts Activision Software out on its own: the way you go on running it month after month. And Pitfall II is no exception.

Lose yourself in the world of

**ACTIVISION**

Activision Software is available at selected branches of B&N SMITH, BOOKS, MUSIC AND SPECTRUM and at good computer shops.

© 1985 Activision Software, Inc. All rights reserved.

SUPER-FAST LOADING TIME!

Commodore AT electron  
**B.B.C. MICRO**

# BUMBLE BEE

A FANTASTIC NEW PROGRAM FROM ENTERTAINING SOFTWARE HOUSE!

Fly the bee around the grid avoiding the toxic clouds, spin the turntables to avoid the spiders, or catch them into the fireballs. Collect all the pollen to slide back the exit doors to advance to the next insect riddled level.

£6.95 (BBC version £7.95)

Commodore Disk price £9.95



COMMODORE 64 VERSION



MICRO  
POWER

All other programs £10  
ENTERTAINING SOFTWARE HOUSE  
115, 117 & 119, MARKET STREET  
LONDON W1P 6AA  
TEL: 01-475 3831  
TELEX: 940125  
PO BOX 20, WATFORD, Herts WD17 9JL

WATCH OUT  
FOR OUR NEW  
PACKAGING AND  
CATALOGUE



## ANSWER BACK

### Relays and m/c

IS IT possible to obtain an interface for the Vic, which will allow the control of simple battery-powered relays? Of course, e.g. small DC motor, and will allow information to pass from the relay to the computer? And where can I find an introductory book on machine code for the VHS? I'd like to buy a copy.

**TRY THE VHS** from Microlinks, which consists of the user guide and provides a useful introduction to machine code for the VHS. I'd like to buy a copy.

If you wish to control more sophisticated, you will need an extra interface as well. A suitable introduction to machine code on the Vic is the *Energy System* book by Paul from Microlinks. Contact: Microlinks, Book Place, Brent, London.

### Expander and modem

I HAVE A Vic 30 with a 16K, variable RAM pack and would like to add a Super Expander. Will they run at the same time in a 16K-bit machine board or would I need a double-size machine board?

Also, is there a modem available for the Vic 30? And can you publish a listing for a good long piece of music, for the Vic? I can give you home use facilities any time where A. M. or 10/10/80?

**Microbit?**  
No! No!  
THE MIBB expander consists of 32 KRAM plus 4K ROM located at 0000-00FF (0004-0005), and is available for either 16 or 32K expansion. You can use your 16K RAM pack as well, but if your machine pack contains a 16, which has you cannot use this option, because it will try to use the same space as the Super Expander.

On machine, register through Internet, Unit C3, Farnham Trading Estate, 8-10 Creekside, London SE18. Tel 01-893-9947. Interface's phone is 16, but does not use Telecom approval and will not access Prodigy or Mosaic.

As for music on the Vic, they don't seem to be a book devoted to the subject, although many general programming guides have sections on music, perhaps a reader can make a suggestion on the net?

### Printer and plotter

I WOULD like to know about a 1500 pages - plotter with the disk drive and MIBB 80K printer. Is this possible? My main purpose is purchases a 1500 to print address labels, with the letters on the left. A 2000 from South Shields. Your new driver. YES, it is possible, because the 1500 has a device number of 4 and the MIBB is device 4. Your program should open a channel in the 1500 with, say, 12345678, and to the 80K with 00000000, and then PRINT "A", and then PRINT "A", "Address labels" and PRINT "A". "Letters" will output to the respective device.

If you are using a word processing program, then set the device number, accordingly.

### Loads of errors

SOMETIMES when loading a program from tape, it stops with LOAD ERROR just before loading. What is the PEEK location of the error message - would it be possible to POKE the original number back into it so that the computer didn't stop on load error and return on loading the program?  
Jim Davidson  
Aston  
M Bristol

WHEN A program is read on tape, the copies are made by the system. On loading,

and one copy is loaded, then the second. The two are compared, and if there are any differences you get LOAD ERROR. Considering the error message in the case of a corrupted load will not help, clear essential parts of the program over by saving. However, the program may still RUN if the error is not significant. In this case, check if the end of tape controls agree with the end of program pointers. X and Y should be identical in the following line:  
 $X = PEEK(40) + 256 * PEEK(41) - PEEK(10) + 256 * PEEK(11)$

If the listing is complete, and does not finish with garbage, then you can restore the program.

### Program generation

I WANT A 64, and am trying to get it to generate an any program. It's easy enough to get it to produce 10 lines by printing the line on the screen then filling the keyboard buffer with RETURNS, then ending the program.

I can generate tapes later by making the line "new line" + GOTO line, but the GOTO produces a CLR, losing the data in the buffer, and since this is where I store the new program data I cannot use this method. Is there any way of generating the GOTO lines performing a CLR after program done, or say only one way of allowing lines into 10 lines of program pointer data?  
J J Foulden  
Coker  
Gloucesters

IT IS NOT the GOTO statement that performs the CLR, but the addition of the new line to your program.

You can get round this problem by FORING your data over an area of memory which is above BASIC, and then PEKING that area when the GOTO is implemented. The PEKING will be in the original program, and this line could be replaced by the line containing the PEKING, by making your first new line number the same as the number of the line containing the PEKING.

You can use a random location so that you can count the number of lines added, e.g. POKE 4,PEEK(4) + 1. The CLEAR causes the rest of memory above BASIC.

### Random access

CAN YOU help me with a program which will generate random numbers, then at the end store the first thirty random numbers into memory? I have an uncompleted file, but will soon be getting a suitable test pack.  
A Campbell  
Kewdale

The following program will work on an 8 Kc for any Commodore computer:  

```
10 X = RND(8192)
20 SET THE RANDOM NUMBER GENERATOR
30 Z = 0
40 FOR I = 1 TO 30
50 Z = Z + I
60 PRINT X
70 Y = Z + 1
80 END
90 END
```

The counts the number of lines that X is calculated.  
40 NEXT I  
50 PRINT "NUMBER"  
60 PRINT "APPEARED"  
70 PRINT "TIMES"  
80 PRINT "ANY MORE"  
90 PRINT "A"  
100 GOTO 40  
110 END

The RND statement and line 70 need not be entered, and the reason why variables are set first in line 10 is that on 8K machines variables above the program level and below BASIC, in that of number variable is unassigned after BASIC is executed then the value zero area is moved up in memory, in order to insert the variable in its correct position. This makes the program slower.

If you need help with a technical query or problem write to Jack Cohen, Commodore Horizons, 12-13 Little Newport Street, London WC2E 8LL.



# CLASSIFIED

WUPR Data using the 1541 64  
Kilobyte analyzer and 256K  
memory. Graphics programming  
is done on a 256K 4740 128K  
and has two 5 1/4" disks 4 1/4" drive  
Master Budget 120 Lines 800K  
B. Resurgence Home

IBM PC software. Some might  
be available. IBM monitor 14" 20"  
16" 15" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

## FOR SALE

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

VC 20 2 1/2 monitor 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

## FOR SALE

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

## FOR SALE

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

## FOR SALE

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

## FOR SALE

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

COMMERCIAL 24 2 1/2  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"  
16" 14" 12" 10" 8" 6"

## MICRO COMPUTER AUCTIONS

REGULAR MONTHLY AUCTIONS FOR ALL MICRO HARD AND SOFTWARE. SEND NOW FOR ENTRY FORM OR NEXT CATALOGUE TO:

Micro Computer Auctions (CHI)  
Northington House  
88 Gays Way Road  
London WC1X 8TL  
Tel: 01-242 0012 (24 Hours)

1500 printer, plotter, hard disk  
500 1600K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K  
200K 200K 200K 200K



# A FREE LIGHTPEN!

Yes a FREE Light Pen! with every GRAPHIC! Graphic is the ultimate in drawing, designing or painting! Using the light pen all yours, which incidentally has a full 3 year warranty! Graphic will do anything other things allow you to:

- Draw free handed on the screen anything from a Mickey Mouse to your latest integrated circuit with all the fill colour and erase facilities of course!
- Save/Load your latest master piece to/from the disk tape drive
- Or directly copy the drawing on the screen to the printer! And keep it for ever or send it to travel as a post card!
- Design your own colourful notes and classrooms
- Play the games in the package! Or use the light pen in your own games/education programs

GRAPHIC is available on disk and tape. Tape version is £1599 and disk version (recommended) is £1999



All you 1540/1541 disk users DMOR is here at last. DMOR is the disk monitor you have been waiting for it will allow you to:

- read/write blocks from/to the disk
- display and edit blocks on the screen
- display and send disk messages/commands
- transfer your programs from tape to disk or disk to disk or even disk to tape! • and more!

DMOR comes on DISK at only £999

Do you see tapes? Are you sick and tired of waiting for your programs to be loaded/saved from/to the tape? Then you need a **TORNADO**! Tornado allows you to Save/Load/Verify your Basic/machine code programs faster than a CBM 1541 disk drive itself! Due to popular demand! Tornado now comes with new and more powerful commands plus extra instructions to assist you in making fast versions of your existing machine code/BASIC programs. Tornado is available on tape for £599 94 and 94 + Vtu 20

Do your Run/Stop and Restore keys often fail? Do you want to come out of those crashes? Or get into those unbreakable programs? Then what are you waiting for, get yourself a **BREAKER**! Breaker works and let your computer know who is the boss! Breaker can be connected to your machine in seconds, no soldering, included with the Breaker is a copy of basic recovery software to help. Now available for any CBM 94 or Vtu 20

A FREE BREAKER WITH  
EVERY TORNADO IF YOU  
USE THE COUPON BELOW  
NOW!

## BSF CSL, 82 FURNACE DRIVE, CRAWLEY, W SUSSEX RH10 6JE.

Please send me ..... Tornado at £999 + my  
best discount

Please send me ..... Breaker at £799

Please send me ..... Ram File at £799

Please send me ..... Lightpen at £1199

Please send me ..... Graphic at £1999 (tape)

Please send me ..... Graphic at £1999 (disk)

Please send me ..... DMOR at £999

I enclose cheque/postal order to the sum of £

Name  Surname

Address

Tel.

Please use this form and block letters only. All prices are inclusive of postage unless order only add £3.4 outside UK. Please print in  
BSF CSL, 82 FURNACE DRIVE, CRAWLEY, W SUSSEX RH10 6JE





## MICRO COMPUTER AUCTIONS

REGULAR MONTHLY AUCTIONS FOR ALL MICRO HARD AND SOFTWARE. SEND NOW FOR ENTRY FORM OR NEXT CATALOGUE.

TO:  
Micro Computer Auctions (CH1)  
Northington House  
59 Greys Inn Road  
London WC1X 8TL  
Tel: 01-242 0012 (24 Hours)

## ASTROLOGY for beginners

A Starter Pack containing a simple program to calculate a horoscope, an introductory booklet and two self-teaching programs (one of chapters for beginners) only £11.50

No previous knowledge required!  
Available for Commodore 64 & Commodore PET  
3000-40000000

Also many other programs for those experienced astrologers. Please contact the Astrologer Group for details. [www.astrologer.com](http://www.astrologer.com)  
Available from PET £9 for £11.50 (no other). Contact us via the UK's fastest & most reliable mail order service.

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

ASTROCALC (Epub) 08 67 Phoenix Road  
Nassau Hempstead, New York 11562 USA Tel: 0042 81808

## Superbase 64

Superbase 64 is a powerful and flexible database system for the Commodore 64. It is designed to be easy to use and to integrate with other software. It is available in both hard and floppy disk versions. For more information, contact the publisher, [www.superbase.com](http://www.superbase.com).

## VIZAWRITE 64

Vizawrite 64 is a powerful and flexible word processing system for the Commodore 64. It is designed to be easy to use and to integrate with other software. It is available in both hard and floppy disk versions. For more information, contact the publisher, [www.vizawrite.com](http://www.vizawrite.com).

## Master 64

Master 64 is a powerful and flexible spreadsheet system for the Commodore 64. It is designed to be easy to use and to integrate with other software. It is available in both hard and floppy disk versions. For more information, contact the publisher, [www.master64.com](http://www.master64.com).

\*\*\* 0011 11 000000 \*\*\* 0011 11 10011 \*\*\* 0011 11 10011

NAME	ADDRESS	PHONE	FAX	TELETYPE	TELEX	POSTAL CODE	COUNTRY
ALFA	...	...	...	...	...	...	...
BETA	...	...	...	...	...	...	...
GAMMA	...	...	...	...	...	...	...
DELTA	...	...	...	...	...	...	...
EPSILON	...	...	...	...	...	...	...
ZETA	...	...	...	...	...	...	...
ETA	...	...	...	...	...	...	...
THETA	...	...	...	...	...	...	...
IOTA	...	...	...	...	...	...	...
KAPPA	...	...	...	...	...	...	...
LAMDA	...	...	...	...	...	...	...
MU	...	...	...	...	...	...	...
NU	...	...	...	...	...	...	...
Xi	...	...	...	...	...	...	...
OMEGA	...	...	...	...	...	...	...



Calco Software

1101000 0000 1200000001 000000 000000 000000



Having captured the upper hand in the computer disk battle, the company is about to launch its most effective disk your business down.

# Floppy Disk II

Available in 20 packages

- Standard soft disk system (user base disk) - floppy disk
- Special price with increasing difficulty
- 3 types of floppy disk - 5.25, 5.25, 5.25
- 3 types of floppy disk - 5.25, 5.25, 5.25
- 3 types of floppy disk - 5.25, 5.25, 5.25

VGA 500

If you thought Floppy Disk was good  
Proprietary by Lotus Inc.



# TERRORIST

CONTROLLED EXPLOSION  
RELIABLE, REPEATABLE  
SOFTWARE AND ACTION

£7.95

VGA 500

THE HILL'S MATHS requires your penmanship skills. List answers clearly, and have your Danger Mouse to read them.

It is designed to illustrate a simple mathematical calculation in straightforward steps.

Danger Mouse will score first and score with a number 100 written on a page of paper which also has four columns, A, B, C and D.

Each column contains arithmetic and directions to the next step. All numbers should be rounded to the nearest whole integer, and the answer appears in column D containing the final result.

All you have to do is work out the purpose of the mathematical calculation which the driver illustrates.

When you've worked it out, remember the instructions and send your entry with your name and address to Danger Mouse Competition, Central Post Services, 12/13 Little Newport Street, London, WC2E 8JL, to arrive no later than the first working day of November.

Danger Mouse winners will receive two Danger Mouse games from Creative Sparks. *Double Trouble* is an arcade adventure featuring all the TV characters, *Danger Mouse, Mouse Greenback* and *Woolly Wombat* in a mad scramble to stop the Baron's plan to create a giant-sized Danger Mouse.

The *Black Force Chapter* is a sci-fi and graphics adventure which finds DM at a really sticky situation — but you can help him out of a jam!

So the contestant, which will be compiled in an age-appropriate and amusing manner in 10 words or fewer, is to send to help Danger Mouse out of a sticky situation.

General competition rules apply.

The winners of the September Quiz have come out as Mr Wilkinson of Northampton, Jeremy Pater of London, David John Price of Ipswich, Steve Minton of Walsingham, William Duffell of Derby, Andrew Lewis of Dorset, Stephen Jones of Dudley, MJ Hughes of Milton, Carol Crookes of Gwynedd, Richard Pike of Wakefield, Robert Miller of Glasgow, Andrew Lusk of Croydon, Simon Harvey of Luton, Peter Thomas of Brighton, MJ Hughes of Leeds, M. Thomas of Brighton, J.

Creative Sparks  
presents

**Danger  
Mouse  
(and Penfold)**

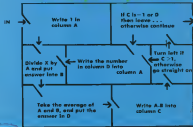
**In a sticky  
situation! Help  
them out and you  
could win two new  
Commodore 64 games!**

Copyright of *Penfold, Mouse  
Gladys* of Epswich, SC  
Nicol of Walsingham, and  
Tony Haddock of Wexley.

Each will receive a package  
of the latest games from  
Creative.

The winner of the *Penfold  
Banks* competition is Colin  
Dale of Haywards Heath who  
will receive a complete set of  
Commodore 64 books from the  
publishers of *Commodore  
Reviews*.

## The Mystery Maze







# Alice

## IN VIDEOLAND



**NOW  
ON  
CASSETTE!**

## PURE MAGIC!

Join Alice in her journey through Videoland - an enchanted place populated by strange creatures such as bread-and-butterflies and pipe-smoking caterpillars, where little girls change size and flamingos turn into croquet mallets!

Alice in Videoland is a revolutionary new concept in entertainment for the Commodore 64, incorporating some of the finest graphics ever seen on any home computer. Accompanied by a stunning musical score, there are four different game scenes involved, and your performance in earlier ones will affect your ability to get through later ones and determine your overall total score.

**Scene One** - Stunning tile page graphics give way to the first game scene as Alice falls into the rabbit's warren. Score points by collecting the rights to be found there - including keys to open doors, borders to make her smaller, cakes to make her bigger.

**Scene Two** - Out in the garden the Cheshire cat leads on as Alice meets the pipe-smoking caterpillar. Help her to catch the bread-and-butterflies and the smoking-house lads that change into the balls used in the croquet game in the last scene!

**Scene Three** - Alice is a pawn in the chess game where her opponents are the Jabberwocky and Tweedledum and Tweedledee. Help her across the board by protecting her with your Alfred Knight!

**Scene Four** - The most bizarre croquet game ever! Help Alice hit the balls through the playing-card-soldier hoops before the Queen of Hearts stomps on them!

Alice in Videoland is available for the Commodore 64 on disk - £12.95, and now on cassette - £8.95.

Alice in Videoland features graphics created with the Kalle Pad.

# Audiogenic LTD