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ABC

Submitting articles

Commodore Magazine welcomes readers' contributions — either articles or program listings. Articles should be typed double-spaced with a wide margin. Programs should, wherever possible, be printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return every article or program submitted, so please keep a copy. If you want to have your program scanned you must include an a.s.c.



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EDITORIAL

NEW MACHINES ALWAYS make their manufacturers nervous. A company may not fold just because its new micro is a spectacular flop, but its image will be dented and it will have to write off an enormous amount of effort, research and capital. A succession of costly flops and the company will fold.

The rewards of launching a successful machine, however, are self-evident. Quite apart from the immediate financial returns, there are numerous advantages in establishing a wide user base and fostering brand awareness. A successful micro may not be a license to print money, but it comes close.

The C16 and the Plus/4 have only been on the market for a few months, so it is perhaps a little premature to make any final judgements. Nevertheless, it is possible to draw some conclusions now.

Neither machine is a smash-hit, though the C16 appears to be selling quite nicely. The Plus/4, for all its built-in software, appears to be falling on stony ground. At the risk of seeming facetious, the reasons are outweighing the pluses.

This does not mean that either machine is doomed to an early scrap heap. The Commodore 64 was not an instant success when it was first launched in the UK. It only took off when Commodore reduced its price.

It is interesting to note that Commodore appear to be considering the idea of constructing an adaptor which would make the Plus/4 compatible with the 64. This would allow it to run software written for the 64, thus making it instantly more attractive to both software companies and users.

However, with 16 and 32 bit machines already hovering on the horizon, neither the C16 nor the Plus/4 are likely to have extended selling lives. If these machines are going to be successful, they will have to take off soon. Judgement may be suspended for the moment, but the day of reckoning is not that far off.



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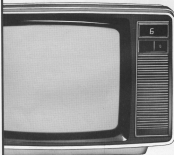
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from



FOR COMMODORE 64



LETTERS PAGE

Terminal tips

HERE ARE a few more useful screen codes for anyone who has Terminal's Super Gridder game.

When the game has loaded press **RUN/STOP/RESTART** then type:

SYMBIV — makes the grid invisible.

SYMTW — to give infinite lives.

J. Dale
Mansforth
Cheshire

We goofed — twice

IN THE December issue you printed a program called Space Misses. I typed the listing in and checked and amended minor errors. When I ran the game everything was OK until I pressed a key to start, and all that came on to the screen was "ERR-AC IN 708". Could you please tell me what was wrong with the program?

Nigel Deley
Maidley
W. Yorks

YES — WE goofed! Space Misses is in two parts, and we only printed the first part, which gives the instructions for the game but not the game itself. You'll find the second half of Space Misses in this issue.

Printed on the subject of goofs, the listing for Steve Lee's Kai Whack in the same issue used non-standard graphic characters. If you're having problems, replace the solid square, short dash triangle and diamond with appropriate cursor symbols; and the other graphics with colour control symbols. You should then be able to attack as many rats as you like without difficulty.

CSR UPC *****

CSR DOWNS *****

CSR LEFTS *****

CSR RIGHTS *****

HOME | CLR +

COLOURS

BLK ■ 001 ↓

WHT ■ 004 ↓

RED ■ 002 ↓

CYB ■ 011 ↓

GRN ■ 012 ↓

BLU ■ 013 ↓

YEL ■ 014 ↓

Vic 20 forever

I HAVE bought every issue of your magazine since it started last year. I own a Vic 20 and have been very disappointed with November's issue since there is hardly anything for the Vic; there was only one game to type in, and that needed the Super Expander

Software reviews for the Vic were also scarce. I've always liked your magazine until now, so please have more for the Vic.

John Mann
Northampton

EVEN THOUGH the Vic has now been discontinued, so long as there is a demand for articles and a supply of new software from manufacturers, we will continue to support it, along with the 64, C16 and Plus's. You'll notice that there are several new Vic games reviewed in the Neil Hill section, and we'll continue to publish readers' listings as long as you continue sending them in.

Vic 20 — never

WITH THE demise of the Vic 20 there may be a number of your readers who are considering the 64 as a replacement. Let me sound a note of caution.

My original configuration was the Vic 20, 1512 printer, Database and 128K disk drive. On enquiry with my supplier I was assured they were all compatible with the 64. The supplier gave me a wined "EXPEN" command to use with the 1280 which was confirmed by CRM Carby. Needless to say it did not work. Further enquiry to CRM gave me a couple of POKES which appeared to work until I attempted to load a database program. Yet another enquiry gave me the information that the POKES

would not work if there were any LOAD/SAVE in the program, and the only way to ensure success was to change a chip in the 1280.

I loaded the 64 Tape Computing magazine cassette from the Database and got a 66% LOAD ERROR response. A friend loaned me his CIM and everything was perfect. This means I've spent £21.45 for a chip and £29.95 for a CIM.

So, when a supplier tells you that peripherals are 64 compatible — they're not.

C. A. R. Harris
Farnham

LET'S JUST clear a few points up. There's no functional difference between the Database and the CIM, so the problems with Mr. Harris' unit were probably caused by misaligned leads or otherwise. The 1280 and 1241 are, however, different, and the modification mentioned would be necessary to use the 1280 satisfactorily with the 64.

The moral of the tale is that suppliers can be more interested in shifting products than in checking their facts. Always use the product working before heading over the coast.

This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons, 13-15 Little Newport Street, London WC2E 6ND



**NEWS
DESK**

Tynesoft promises C16 games

SOFTWARE for the new Commodore 16 and Plus/4, impossible to obtain at the time of writing, may soon be available from at least one major software company. Tynesoft has plans for a Christmas release of a starter pack of four C16 games, *Shock*, *Climb*, *Munchit* and *Hoppit*, at £4.95.

The four games are variants of well-known arcade games, and have been produced in co-operation with Commodore UK.

Tynesoft spokesman Colin Courtney said "The C16 is doing well locally, and we have plans for several more games. Despite the small history we've been able to design *North Sea Oil Rig Disaster*, which has eight scrolling screens, and we're now working on *Olympiad*". *Oil Rig Disaster* features several rigs

COMMODORE is to sponsor the 1983 British Computer Society Schools' Computer Quiz. Sponsorship amounts to £50,000, including £12,000 of prizes for schools.

In parallel to the quiz, Commodore is running a special lease and sponsorship scheme. Every school taking part in the quiz will be offered the loan of two complete

connected by pipelines, and a helicopter which has to avoid flames to land divers who can repair the damaged pipelines. *Olympiad* is a variation of the popular Olympic Games theme.

Tynesoft's latest release for the 16 include *Superfile*, a budget database on cassette at £9.95 or disk at £12.95. Utility programs for the Plus/4 are also on the way.

For more details contact Tynesoft, Addison Industrial Estate, Waplington, York, York & Wear, 091-414-4431.

Commodore quizzes schools



Commodore 16 systems for three months. If at the end of the period the school wants to keep the equipment, Commodore will add £3 to every £7 the school rates its payments.

For further details of the quiz, contact Mrs Sharon Abouzeid at The British Computer Society, 13 Mansfield Street, London W1M 0BP, 01-437 0411.

Have a Banana



THE ODDLY-NAMED Banana interface makes the 16 or Vis 20 to control DC motors, stepper motors and relays. It has 14 four millivolt

banana sockets on its panel, including eight relay outputs, eight 12-volt logic signal outputs, and eight inputs. Special attention has been paid to requirements of construction and safety of use, and the Banana is recommended for use in educational establishments (and, presumably, now).

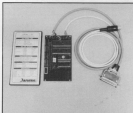
Software and hardware for specific experimental uses is provided, and the Banana is available direct from the manufacturers. Contact Castle Associates on 0725-594250 for more details.

Ross in control

ROSS ELECTRONICS' RP-170 interface control console enables you to interconnect a TV, computer, videorecorder, video game, cable TV or additional VTR dubbing and monitoring sets.



without complicated wiring. Measuring 264 x 98 x 83 mm, the RP-170 has one phono input and five coaxial, which may be freely interconnected through a bank of six slide switches. The unit costs around £30 and is available from specialist audiovisual dealers or from Ross Electronics, 49/51 Parkway Road, London N7 8JL 2QJ8.



Jansen-Elektronik's PPTV-64 interface

West German printer link

JANSEN-ELEKTRONIK has announced an intelligent multi-function Controlcon printer interface to connect the 16 to devices such as the Epson FX-80 or 80a.

PRINT-64 can dump four pictures in shades of grey, and can cope with user-defined graphics and all Commodore PET graphics. The interface comes with a tutorial program on disk, though this is not necessary for normal operation. Fourteen secondary addresses for print commands are also supported.

The interface's price is to be held at £68.95 until January 1st 1985.

Contact Jansen-Elektronik, Unter-Offbach 1, 5890 Lovenshausen II, West Germany.

Slomo cuts the pace of micros

CAMBRIDGE Computing's Slomo is now available for the 64 or 760. This unique device consists of a cartridge port connector with a short length of cable, connected to a control box with two buttons and a lamp. The internal circuitry introduces an adjustable interrupt into the computer's operating system, with the result that the action of any program, in Basic or machine code, can be slowed down or frozen.

Apart from making it easier to debug difficult arcade games, Cambridge Computing suggests that software houses



might find the device useful in the production of screen shots. The Slomo is guaranteed not to damage the computer, and can be left connected at all times.

Cost is £14.95, through retail outlets or direct from Cambridge Computing, 61 Dittus Walk, Cambridge CB2 9QZ, 0223-214411.

Pulling the plug on mains noise

COMPUTER LINESES plagued by mains surges (causing computer crashes when the fridge switches itself on) will be pleased to know that two new products aim to solve the problem.

The first, from Power International, is The Plug, costing £17.95. It's a 13 amp device which is simply fitted to your

computer mains cable, and goes into a conventional wall socket. The internal circuitry consists of a transient suppressor and an RFI filter, which effectively eliminates "spikes" in the power supply. Contact Power International, 2A Lombard Road East, Portsmouth, 0705-124113.

For units with more



Rayman's Power Plug



PI's The Plug

equipment to protect, the Power Bloc from Rayman Electronics is a four-socket unit with a 150 Joule spike suppression rating. It features a main reset, extension cable and A/B5 plastic case, and costs around £50. Contact Rayman Electronics, 12 King Edward Street, Sharnbrook, Mansfield, 0821-748129 for more details.

Spectrum emulator imminent

WHITBY COMPUTERS' ZX Spectrum emulator software, just announced at £14.95, is designed to allow Sinclair Spectrum Basic programs to run on the Commodore 64.

Several months ago one company's claim to have produced a Spectrum emulator which could cope with machine code proved to be without foundation. Whiby Computers, a company head known for custom-designed Basic extension packages for the 64, has now released the Simulator package, which adds the commands from Sinclair Basic to the 64. Whiby claims that most Spectrum listings can now be typed into the 64, while the use of 64 Basic is unaffected.

Whiby suggests the Simulator as an ideal method for Spectrum owners who wish to upgrade to the 64 to retain Basic programs, at the same time adding many of the functions of Sinclair's £50 Interface 1, which has an RS232 port, and giving the new owner the use of the 64's quality keyboard, disk handling and serial port facilities.

We'll review the Whiby Computers ZX Spectrum Simulator as soon as possible. Meanwhile contact Whiby at T, Chable Hill Road, Whiby, N. Yorks, DD7 6QJ666.

Printing and plotting on a budget

DAIICHO-DOKKI-based Danfax, distributor of products from Japanese giant Sakata Shokai, has announced the SCP-800 four-colour printer-plotter, which retails at under £300.

Apart from handling A4 paper, the SCP-800 has a 110 mm paper roll option. Printing speed is six or 12 cps depending on character size. Interface options include Centronics eight bit parallel, serial, or RS232C with an adaptor.

For more information, contact Danfax at Danfax House, Boney Road, Basingstoke, Hants, RG23 3BZ, 01256-46481.

At the same time the Pre-



Danfax's SCP-800 machine

man Robot Plotter, a three-colour device related to the turtle, has been announced. The Preman consists of an interface unit and a free-moving drawing head connected by a ribbon cable.



Preman's Robot Plotter

At £249, the Preman is cheaper than many printer-plotters, and is not limited in the size of paper it can use since it does not have a work surface — it can be operated on an ordinary table. Connection to

the micro is by RS232C interface, and Commodore 64 software is in preparation. Contact Preman Products Ltd, 8 Harewood Close, Dominion Way, Working, W. Sussex, BN14 8AP, 0903-20060.

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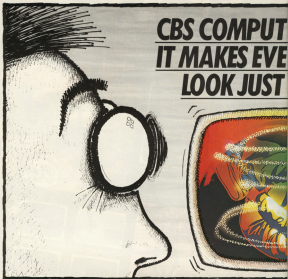
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18 FEB 1988

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Probably the most exciting game yet developed for the C-64. Fast loading screens.

BIRD MOTHER

This is a delightfully original game which uses software in the writing for a highly compelling and challenging game. Unlike the *Bird Mother* as she builds her nest and raises her young, finally protecting them from a predator hawk.

Fast loading screens.

The stunning graphics and music in *Bird Mother* are not to be missed.

WING COMMANDER

This is a highly sophisticated flight combat simulator which puts you in the pilots seat. Highly advanced realistic code programming has ensured you feel every stomach lurching dive and roll.

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Saving time and trouble with Basic sense

Typing in listings or writing your own programs needn't be a frustrating chore — Sarah Cotton passes on some useful hints

WHEN WRITING your own programs, or entering those from books or magazines you will find yourself repeatedly typing the main Basic keywords. Obviously, if these can be typed in very quickly then a lot of valuable time can be saved. Program 1 should help you to develop this skill.

When you RUN the program you will be asked to input a keyword. Do this, following up with the return key. If you make a mistake then the computer will tell you and give you another chance.

Many of the Basic keywords can be abbreviated as you type in a program, but when it is listed the words will all appear in full. A complete list of abbreviations appears in the appendix of your user manual but Table 1 shows a few of the most useful ones. For example, type:

```
10 "HELLO"
instead of:
10 PRINT "HELLO"
```

When typing in any program you are very likely to make mistakes or wish to change some of the lines. Re-typing a whole line for one slight alteration can be extremely tedious, but the INSERT/DEL and cursor keys make things much easier. For example:

```
10 PRINTER = 4
```

Let's say you want to change the 4 to a 2. Use the cursor up key to take the cursor back to the current row of the screen the line appears on. It should be flashing over the figure 4 of the number 14. Now use the cursor right to position it over the 4, press \downarrow and then RETURN. To check your alteration has been noted use LIST.

Insert

Let's go back to our original program, this time changing the 4 to 15. This will mean us "inserting" an extra character. As before, move the cursor until it is flashing over the 4. Press shift along with INSERT/DEL and a gap will be created. Follow this by depressing the keys 1 and RETURN.

This alteration can be reversed by positioning the cursor over the 1 and pressing INSERT/DEL. Immediately the 1 will disappear.

This method of editing can also be very useful when many similar lines have to be typed in. See program 2.

Type in the first of these lines in full, remembering to press return. For each successive line move the cursor up and change everything that needs to be altered, including the line number itself. Remember to press return after each line, and use LIST to check all have been entered correctly. ▶

Program 1

```
10 PRINT "A":REM CLR
20 R=INT(RND*(1+10))
30 FOR I=1 TO R:READ N:NEXT
40 PRINT "DO PLEASE TYPE " :N4:REM CRSR DO
LN
50 INPUT #4
60 IF N=0 THEN PRINT "DO MISTAKE":GOTO4
8:REM CRSR DOWN
70 RESTORE:GOTO 10
100 DATA PRINT,POKE,INPUT,GOSUB,RETURN,GOTO,THEN,FOR,NEXT,RESTORE
```

Program 2

```
10 IF X=Y THEN G=0:PRINT G:END
20 IF X=Y THEN G=1:PRINT G:END
30 IF X=Y THEN G=2:PRINT G:END
40 IF X<Y THEN G=3:PRINT G:END
```

Program 3

```
10 PRINT "HELLO" : : PRINT "GOODBYE" : : GOTO 10
```

Program 4

```
10 FOR I=1 TO 4
20 PRINT "HELLO"
30 NEXT I
```


4 In entering programs from books or magazines I always find it useful to have a piece of card to put just below the line I'm typing in. As your eyes flicker from the screen to the program listing, it saves them from having to search around the page, and it also helps to avoid mistakes.

Book or magazine programs will probably contain a lot of REM statements. If you are concerned with the structure of the program or think you might like to make some alterations to it then these should be left in its full. Otherwise you could save time by just typing the REM's and omitting the following explanations. It could be dangerous if you got rid of the REM lines completely. For example, if line 100 is REM Make a Noise and elsewhere there is another line saying GOTO 100, you would get an "Unlabeled Statement" error if line 100 was totally removed.

While writing your own program, it is very helpful to keep a list of variable names and what you are using them for. This will save you having to keep looking back over your program to find the first mention of a certain variable, and working out what it has been assigned to.

The amount of typing you have to do can be reduced by using short variable names — for example, AS instead of AAS. Also, if a number or word is to be used several times it is best to hold it in a variable rather than keep typing it out.

Multiple lines are lines containing more than one instruction. For example, see Program 3.

Branching

Each statement is divided by a colon (:) but it should be noted that each line can only be 80 characters long. These multiple lines reduce the number of line numbers that must be typed in. Before you start using them here is a brief warning. Consider this line:

```
IF B=X THEN PRINT "HELLO" : GOTO 100
```

The computer will only branch off to line 100 if X equals B. If this is not true the whole line will be ignored.

When writing a program you will often find that parts of it will need to be repeated. This can be achieved in two ways. The first is the FOR...NEXT loop.

As I have already explained this method of repeating an operation a set number of times in an earlier article, I will not go into any details. Program 4 is a short routine to print a word 4 times as a reminder.

A For...Next loop only allows you to repeat an operation one time straight after another. A subroutine is a short program in its own right, which can be called by the main program at any time. The lines of a subroutine are generally in the thousands, and it is conventional to begin them with an explanatory REM statement.

The command 'GOSUB X' will send the computer to the subroutine beginning with line number X. The 'RETURN' statement does the opposite, returning the computer to the place where it left off in the main program. See programs 5a and 6.

The subroutine is held in lines 1000 ▶

Program 5a

```
5 REM PROGRAM FOR VIC-20
10 PRINT "a":REM CLR
20 INPUT "WHAT IS YOUR NAME " :NA
30 GOSUB1000
35 PRINT:PRINT
40 INPUT "HOW OLD ARE YOU " :A
50 GOSUB1000
60 END
1000 REM MAKE A NOISE
1010 POKE38876,15
1020 POKE38876,300
1030 FORT=170250:HEXT
1040 POKE38876,0
1050 RETURN
```

Program 5b

```
5 REM PROGRAM FOR COMMODORE 64
10 PRINT "a":REM CLR
20 INPUT "WHAT IS YOUR NAME " :NA
30 GOSUB1000
35 PRINT:PRINT
40 INPUT "HOW OLD ARE YOU " :A
50 GOSUB1000
60 END
1000 REM MAKE A NOISE
1010 POKE54296,15
1020 POKE54277,0
1030 POKE54276,348
1040 POKE54273,221:POKE54272,227
1050 POKE54276,17
1060 FORT=170250:HEXT
1070 POKE54276,0:POKE54277,0:POKE54276,0
1080 RETURN
```

Program 4

```
10 FORT=1705
20 READ N&T1,N&T2
30 PRINT N&T1,N&T2
40 NEXT
100 DATA FRED,123, JACK,356,PETER,874,560
200 JANE,720
```

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4 onwards. Each time the user inputs information, the computer is sent to the subroutine by the GOSUB command and works through it. When it reaches the RETURN it goes back to the statement following the GOSUB command.

The "END" is required in line 58 to stop the computer running into the subroutine. If it is omitted you will get a "Return Without GOSUB" error because a Return has been encountered and no GOSUB command has been found.

The use of subroutines is essential when writing games programs. The computer needs to constantly branch off from the main program to perform such operations as moving objects, firing and making noise.

Subroutines can often be used in more than one program so it is useful to keep a record of the most versatile ones for future reference.

Arrays

Earlier I mentioned the use of shorter variable names. Here is another way in which variables can save you time. Arrays are lists of variables with the same "first name" which can hold either numbers or letters. An extra number in brackets following the first name allows us to distinguish them. This number is called the SUBSCRIPT.

For example, let's read in 5 names along with their telephone numbers and print them out on the screen (program 6).

The numbers are held in the variables N00 to N04 inclusive, the names in M00 to M04. Without arrays we would have needed 10 separate variables and a longer, more complex program.

So far we have not worried how long the list of variables in an array is. Your computer assumes that any array you mention contains 11 values with subscripts from 0 to 10. It is safe if you need less, and essential if you need more, to add a DIM statement. DIM stands for "dimension an array". It should appear at the beginning of your programs in the form:

Line number DIM first name (size of array)

For example, we should add the following line to our telephone number program:

```
1 DIM N(5), M(5)
```

An array can only be dimensioned once in a program. If we wanted our program to run over and over again then we would add the line:

```
50 GOTO 10
```

If instead we had added:

```
50 GOTO 5
```

then we would have got a "Redim'd Array" error.

Try program 7. Again we get an error. This occurs because the computer automatically performs a dimension operation in line 10, having not met the array before. This cannot be repeated in line 20.

The ideas we've discussed should make it a lot easier for you to use published programs, and to write your own in an efficient way. We'll look in future articles at more ways to make using the Commodore computers easier and more fun to use. ■

Program 7

```
10 M(1)=00
20 DIM M(5)
```

Table 3

COMMAND	ASSIGNATION
CLOSE	CL shift 0
CONT	C shift 0
DATA	D shift A
END	E shift E
FOR	F shift 0
GOSUB	GO shift 3
GOTO	G shift 0
INPUT	I shift E
LIST	L shift I
NEXT	N shift E
OPEN	O shift F
POKE	P shift 0
PRINT	T
PRINT	P shift E
READ	R shift E
RESTORE	RE shift S
RETURN	RE shift T
STOP	S shift T
TEXT	T shift E
THEN	T shift E
STEP	ST shift E
WAIT	W shift A

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Wundaful

Starting role in Wanda Walter, Interceptor Mirror's new Vic 20 scramble game, is taken by their spherical spaceship Wallie.

Versatile ship that he is, Wallie exhibits a strange ability to initiate fire as long as the joystick's direction is pressed. Only when it's released again does gravity take over and he drifts back to earth.

Oh, so it's not the sort of social skill that'll guarantee him a place at Eton, but it certainly helps to avoid the trees, volcanoes

and rugged terrain that swirls along during the game. It's also his only defence against the mutants that zoom along impeding the



airpace. Fail to dodge one of these and Walter loses one of his five lives.

Four distinct terrains, each with its own board of aggression, should keep the player sweating for quite a while. Graphics and sound are superb, with some of the smoothest animations and most polished music you're ever likely to encounter on the Vic.

Scrolling messages, responsive control and a sense of fun make this a package worthy of attention.

Program: Wanda Walter, Vic 20

Supplier: Interceptor Mirrors

Price: £6.99

Graphics: ★ ★ ★ ★ ★

Sound: ★ ★ ★ ★ ★

Gameplay: ★ ★ ★ ★ ★

Boogie with a ghoulie

You may or may not have seen the film *If Not, Not*. It's a brilliantly scripted and produced comedy supernatural thriller about a team of easy chair that mostly consists who sit themselves up as ghost exterminators, and find themselves the only ones standing between the dreaded demon Zed and the hapless world.

The game retains a lot of the spirit (just)

of the film, as you equip your ghostbusting



team, set off to the haunted houses, and try to catch spirits in your ghost traps without

accidentally zapping yourself with your negative ionizer backpacks.

The most enjoyable aspect of the game is the animating musical score, based on Ray Parker Junior's hit song Ghostbusters, and the software speech which is certainly the most impressive yet produced on the 64. This game is going to be the Christmas hit — go out and buy it.

Program: Ghostbusters, 64

Supplier: Activision

Price: £19.99

Graphics: ★ ★ ★ ★ ★

Sound: ★ ★ ★ ★ ★

Gameplay: ★ ★ ★ ★ ★

Quickie brickie

Palace, the people who brought ideas upstairs to your sitting room, has released a pair of original games for the Unexpanded Vic 20. Bricks is one of them.

You have joystick control of a little brickie who begins each game at the bottom of the playing area.

Bricks rain down from that great boiler in the sky, forming an ever growing mound that steadily fills the screen. Fall to

avoid this falling masonry and you'll find out what it's like to be just another brick in



the wall. On top of that, you've got to get to the top of the pile and stay there, not say

when you can only hop up one brick at a time.

By darning about in this fashion, and using the limited facility you have for rearranging the pile, it's possible to scramble up to the next level. Unfortunately, I don't think that Palace, despite being the originators, have produced the definitive version of what is really a very good game-play idea. Good clean fun though.

Program: Bricks, Vic 20

Supplier: Palace Software

Price: £4.95

Graphics: ★ ★ ★ ★

Sound: ★ ★ ★

Gameplay: ★ ★ ★ ★ ★

Di now, play later

A monumental exercise in bad taste, which has gained a good deal of attention from the press (it means the Daily Mail, not Commodore User), Di's Baby is actually quite good fun for those with a strong stomach and a good sense of humour.

There are five screens, in which you have to help the Royal couple conceive and bring in their long series of babies. In the first, The

Arch of Parenthood, Charles roars around with the party steering up after the royal



infant, and it gets more and more tedious as time goes on. What with the slip to the backhammer, avoiding the parrot-of mad doctors and journalists, and flying nappies,

it's fun all the way. A good soundtrack too, composed of music versions of God Bless the Prince of Wales and other monarchic favourites.

Spice graphics throughout, reasonable sound effects and a unique Aggravation Factor scoring method make Di's Baby more than just an exercise in bad taste — though even at that level it's well worth looking out for. Not one to play while the Queen's Speech is on the telly on Christmas Day, though.

Program: Di's Baby, 64

Supplier: Mad Taint Software

Price: £5.99

Graphics: ★ ★ ★ ★

Sound: ★ ★ ★

Gameplay: ★ ★ ★ ★

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The Activision Eight.



Pitfall Harry has to recover the precious Big Diamond from the evil Caverns. But there's a small matter of poisonous frogs, Allergic Scorpions, tempering bats, electric fish.

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Platforming miracles

Software Projects has given admirable support to the Vic 20 and the latest offering, *The Perils of Willy*, deserves to do well.

It's a version of *Mario Bros* (an official one at that) with 33 screens full of the gnomes, walls and other obstacles we've come to expect from this sort of game.

Animated opposition in the form of wild

dogs, pigs and merciless escalators disrupt every attempt to move up to the next level.



As with all "miser" adventures, success traps into the air to collect magic lanterns. Opposing him are the deadly Black Ninja.



a staff-wielding warrior who can give you a annihilator. The animation of the secret spot is remarkable, and the software



speech almost as good as that on *Ghostbusters* (especially a *Mind-bending* trick)

variants of civilization bring, offer them the hand of friendship.

Yes, you've guessed it. It's another



chance to kill now — ask, questions later. Planetary after planetary of poor defences

depends on running, jumping and standing still at all the right times. Master this technique and the early levels should pose no problem. Unlike other machines, the Vic 20 is not quite fit for choice when it comes to mixer games, so this is a welcome bit of gameware. If you've got a 10K, a joystick and a few quid to spare, this one's worth a second look.

Program: *The Perils of Willy*, Vic 20 + 10K

Supplier: Software Projects

Price: £5.95

Graphics: ★★★★★★

Sound: ★★★★★★

Gameplay: ★★★★★★

early chop, and the Green Tame, a generic Snake who flies through the air and tries to kick you in the jugular. Lee responds with joystick-controlled chops, kicks and leaps, and a good time is had by all. It's fun working and which lanterns open the doors to the rest of the 30 chambers, and I have yet to meet the ultimate perk, the ancient Wizard.

Overall, rather good.

Program: *Brave Lee*, 64

Supplier: US Gold

Price: £9.95

Graphics: ★★★★★★

Sound: ★★★★★★

Gameplay: ★★★★★★

when you fall down a shaft).

The pieces of the puzzle which will enable you to open the master control room, and get at the awful Elixir, are found by investigating various computer terminals and bits of furniture. Secret codes help you to freeze the malevolent robots or rearrange the platforms, which will be crucial in some screens.

Overall, a wonderful game, and hopefully the first in a long series from Epyx/CBS.

Program: *Impossible Mission*, 64

Supplier: CBS

Price: TBA (atk only)

Graphics: ★★★★★★

Sound: ★★★★★★

Gameplay: ★★★★★★

travellers are blown to bits in a cascade of explosions, colour and chaos.

Romik does this sort of thing awfully well and although *Galaxia* is yet another version of *Galaxion* it's still very playable.

To be frank, I've seen better from Romik but since one *Antagodon* looks very much like the next it's hard to quantify exactly what's missing from this one.

If you're in the discerning, violent type this is probably worth a place in your collection.

Program: *Galaxia*, Vic 20

Supplier: Romik

Price: £3.95

Graphics: ★★★★★

Sound: ★★★★★

Gameplay: ★★★★★

Kill him, my robots!

One of the first from CBS Electronics is their top-up with 400 T-Bit software while *Epyx*, *Impossible Mission* is a remarkable cartoon-like multi-screen arcade epic in which you play a secret agent.

There are 31 rooms with 80 different robots out to squish you as you try to penetrate the computer-controlled highway of the loony scientist Elixir, who is holding the world hostage with the threat of nuclear

To boldly go where no man...

Here's a subtle little offering for the basic Vic 20 from Romik. Lots of cute little aliens swoop down from another solar system to say hello. "Wo, with all the diplomacy, tact and global understanding that

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Flights of fancy

Flight simulators for the expanded Vic are pretty common, but this has got to be the first comprehensive one for the unexpanded machine.

And comprehensive it certainly seems to be. All the controls you'd expect are there — speed, heading, undercarriage, etc. In fact there's everything you need to take control of several tons of metal and a plane load of human beings.

In what most rank as the understatements of the year, the relay card instructions that the

simulation has been mathematically condensed. When you consider the facilities offered by the basic Vic, the term 'mathematically condensed' seems more appropriate.



There's no room for a 'through the window' display but the screen's full of dials and gauges. These are well presented and

respond satisfactorily to keyboard inputs.

The instructions supplied are clear enough to allow even the non-aeronautical amongst us to take off and fly along for a bit without killing anybody. Landing is another story.

Talking of landing, a nice touch when you crash (which you will) is a little inquiry into what went wrong. Though it probably wouldn't satisfy the Civil Aviation Authority I found it pretty useful.

A great program. A must for aspiring Biggles everywhere.

Program: Flight Zero One Five, Vic 20

Supplier: A&S

Price: £5.95

Graphics: ★★★★★

Sound: ★★★★★

Gameplay: ★★★★★

Dreilbs in trouble

A bit of a peculiarity, this one, perhaps. A matter of an exercise in unusual graphics than a game. On first loading, the game grid looks like something similar to Pac-Man, but that's misleading. The object of the game is to control your Dreilb around the Atomic Flip Grid, where he must flip gaps to form cubes, which then glow. Opposing him are

the nasty Trollebars, who try to break



down the boxes. Having completed all the

possible squares on one screen, your Dreilb must jump through a magic window into the land of the sinister Gompobax, and free the entrapped Dreilbs found there.

Diamonds, mysterious female faces, and the dreaded Screenshot Tanks also occupy the grid.

Overall it's a bit whacky, but very playable. Check it out.

Program: Dreilbs, 64

Supplier: US Gold

Price: £9.95 cassette, £14.95 disk

Graphics: ★★★★★

Sound: ★★★★★

Gameplay: ★★★★★

Snake snack

If you bought a Vic 20 as part of the £100 Laser pack, you'll recognise Space Snake as a version of the maze game given away in the deal.

Set in deep space, you have keyboard control of a snake, as more precisely a snake's head, as it struggles to avoid the mines that fly at it from the right hand side of the screen.

The mines don't look much like mines but that's OK because the snake doesn't

look much like a snake either.



Dodge the mines for a bit and you meet

the entrance of a long winding tunnel, the floor of which is littered by eggs. Grabbing five of these causes the tunnel to end and you're back dodging the mines again.

Space Snake has all the features that make Brix such a huge success — the graphics are basic, the sound's awful and the scenario's pathetic. It's also very, very playable. Should do well.

Program: Space Snake, Vic 20

Supplier: Commodore Business Machines

Price: £4.95

Graphics: ★★★

Sound: ★★★

Gameplay: ★★★★★

Ducking and weaving

This isn't up to the standard we were led to expect it might be by the popular Chiller. However, at £1.99 it's difficult to complain about a perfectly playable little arcade game like this.

There are five screens, and in each your space ship is controlled by the joystick. In the first, bouncing mines must be avoided for a certain time — you can't shoot them. In screen two, you must dodge asteroids and

rockets which are impervious to your weapons. The next is a bit more original, in



that you must travel up a tractor beam to dock with a mother ship, avoiding asteroids

and high gravity wells. Next, you have to break through 20 force shields to destroy the alien mother ship, and here you must struggle to activate the defence system of the alien planet, which is to become your home. I admit I haven't got that far yet, but

although the graphics and sound effects are fairly laughable I think it's fair to say that all that bit should be enough to keep the kiddies happy on Christmas morning.

Program: Stoney, 64

Supplier: Mastertronic

Price: £1.99

Graphics: ★★★

Sound: ★★★

Gameplay: ★★★★★

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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.

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ids, then
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Shoot the Rapids

AUTHOR - PAUL BURN

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 competitive 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 rogue speed boats and insatiable beavers to worry about.

This 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 £7.95.

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Beyond the frontier

The software house with a background in role-playing games has plans for 1985. *Chris Jenkins talks to Clive Bailey*

HAVE YOU EVER paused to think that playing computer games involves not just one revolutionary element — the introduction of high technology into ordinary households — but two? The other is, of course, the concept of games playing as a hobby.

Until the computer became most of us only played games (other than physical sports) on rainy Sunday afternoons or at Christmas. The concept of collecting and playing games, in software form or otherwise, is a relatively new one, and will probably become the subject of many a sociology thesis in the 21st century, when all the work is done by machines and we will face the problem of entertaining ourselves not just on rainy Sunday afternoons, but 365 days a year.

The software house **Beyond** is made up largely of people whose previous experience was in the field of board and role-playing games; strategic simulations and *Blades* and *Dragons*-type fantasy adventures. Now they are trying to do for the software market what they did for the games hobbyists; provide not only quality products, but an involved and sympathetic back-up service.

Experience

Marketing manager **Clive Bailey** explained that **Beyond**, a division of a well-known publishing company, was founded in 1983 by publishers **Terry Pratt** and **Bill DeLong**.

"Terry is a very experienced publisher in the computer market, and Bill has a remarkable eye for a good product. Together they've marketed four games for a range of computers — including *Goodies* for the 64 — and having assessed the demand and established



Bailey of Beyond

trade contacts they launched **Beyond** in April '84."

Beyond currently operates in an unique way — budgeted as a magazine, the company is obliged to release games as soon as they are ready in order to satisfy accounting procedures. "We're hoping all that will change in '85" averses Clive — "we'd like to be more independent, to be able to release games only after we've built up stocks, and be able to preview them to the press beforehand."

The **Beyond** launch titles, *Pyttion* and *Lords of Midnight*, were for the Sinclair Spectrum, though both are not available for the 64. *Pyttion* is typical of the combination of arcade action, strategic thinking and high-quality programming which all **Beyond** titles feature. *Pyttion* is the defence computer of the Battle 5 space colony, and the challenge of the game is to survive in real time for one hour, while defending the colony against saboteurs, alien spacecraft, supply shortages and equipment damage.

Mike Singleton's *Lords of Midnight* has made an innumerable impact on the computer games market; more than just a graphics adventure, it features a "hand-scraping" technique which shows the view through the player's eyes at each step of the game. The player's objective is the defeat of the evil *Doombark*, either by military means with the aid of the *Lords* or by *The Quest*, in which the character *Morkis* must find and destroy *Doombark's* lair. With 32 characters to control and 4000 graphic locations, *Lords of Midnight* can be a complex and rewarding game to play.

Author Mike Singleton, like all the **Beyond** authors, does not work in-house. "Mike has been designing games since the age of nine" explains Clive, "though his

speciality had been in play-by-mail computer-mediated games such as *Starweb*. *Lords of Midnight* was his first attempt at producing an adventure game you could watch as well as play. We like to think that the success of *Pyttion* and *Lords of Midnight* was the salvation of many game dealers through the slow summer period — because they appealed to the hobbyists, they sold readily, whereas other games sell seasonally. *Morkis* carrying on the series with *Doombark's Revenge*, in which *Lance* the *Miscompriser* searches for his kidnapped son *Morkis*. There are 4000 locations in the game, and 128 independent characters. The third part of the trilogy, *Eyes of the Moon*, is planned for release in the Spring."

We asked Clive why **Beyond** launched their major games on the Spectrum, and have only now reached the stage where launches are planned on the Spectrum and 64 simultaneously. "Part of the problem is in finding sufficiently experienced program converters. *Tape Glass* and *Paul Vowry* produced *Pyttion* and *Paul Warren*, the fellow-up, *Heath Vowry* did the 64 conversion of *Pyttion*, and we were very pleased with the results. Often you'll find the programs converted to the 64 from the Spectrum lose quality, but with our conversions we think they get better. Sound effects and graphics are certainly better on the 64, and we want people who can make the most of that."

64bits

"Another of our concerns is cost. We've priced *Pyttion* at £7.95 and *Paul Warren* at £9.95, which we think represents good value for the retailer and the customer considering the complexity of the games. At the same time our market research indicates that there is a market for less intellectual



games at lower prices — the 10-16 age group looking for shoot-'em-ups pure and simple. We're thinking of launching a separate label to put out this kind of program, tentatively called *Blitz*. The kind of price we'd be looking at would be \$3.99.

The main body of the market will consist of 14-21-year-olds, about 20% of whom are female. We don't particularly aim for the female market, though there is a strong tradition of females playing role-playing games, but Decipher's *Everage* features both a villainess and a heroine. What puts many females off using computers is the unnecessary jargon — his, bytes, ROM and RAM are main phrases, and we try to avoid unnecessary technical references. Our game packages and instructions aim to be an interesting read rather than a technical gazette.

Beyond's last four games, bought in from America, are admirably "filmed", to keep the company going. "If they'd been released when we intended to bring them out, in May, they would perhaps have made



"They're all good games, but not state of the art. The Americans are desperate to dump software on the UK, because they made the mistake of treating games software as if it was big business venture instead of a cult or hobby. They're finding out now that you can't just keep pumping out product, like pop music, which is abundant possibly; only very high quality product will sell continuously, since it's really a seasonal market.

Revolutionary

"We'll always consider product from American companies, although many of the best ones have now been signed up by big corporations. One of the products we're working on is *Spy Vs. Spy*, from First Star, based on the Mad cartoon strip. This features cartoon-quality graphics and a revolutionary split-screen technique called *SimulVision*, whereby two players can watch each other's characters, the White Spy and the Black Spy, searching an embassy for hidden documents and planting bombs.

"The *Warrior* is designed by the creator of *Pyreos*, and features the hero travelling on a keyboard-like landscape through a giant silk reeking at *Psy-movers*. The perspective graphics are very convincing, and as you progress through the game you can acquire certain skills such as teleportation, invisibility and clairvoyance.

"There are several other products at various stages of production. *Operation Blitz* was the landmark feature of *Lords of Midnight* combined with arcade features. *Nath* is a follow-up to *Anth*, using the same kind of lateral thinking



problems. *Shadow Squad* is being produced by Denton Designs, part of the full-on team from Imagine. It's a strange adventure featuring a team of six human and android operatives carrying out a daring mission in space, and using some of the reactions for character interaction derived from the ill-fated *MegaGames*.

"We're also thinking of starting up a series of expert systems programs, based on the many magazines published by our parent company. We can establish the audience through market research, and consider programs based on hobbies like fishing or gardening.

"At the same time we're looking at the idea of an international label to put out Japanese and European games.

"Our promotion plans rely on word of mouth rather than heavy advertising and hype. The games-playing market went through everything the software industry is going through, starting with low-quality products and working up to very sophisticated cult games.



Tony Pratt — experienced

a bigger impact. As it was, technical problems delayed them until September, and now perhaps they don't look so impressive." Clive is jumping from the point of view of someone dedicated to the highest programming standards — in fact *Anth*, *Nath*, *MyChess 2* and *Mr Robot* are all impressive programs in their own right. *Anth* is a surreal metaphysical challenge in which you must manoeuvre a "whisperer" through an interconnecting set of chambers, solving problems based on, but not necessarily dependent on, logical thought.

Mr Robot is a 2D-screen Mazic Maze-like challenge, with a difference; after completing all the screens, you can design and set up to 26 screens on your own, using a cursor to select and place features.

Anth is a complex underground adventure featuring high-quality animations. The hero, an Indiana Jones-type explorer, searches through the bowels of a forbidden temple. The hero can walk, run, jump, shoot, crawl and fight with a variety of weapons, and avoid traps set from punks, snakes, man-eating plants, dinosaurs and spiders.

There's also a powerful three-dimensional chess program, *MyChess 2*.



Bill Delaney — eye for a good product

"From my marketing experience in gaming, banks and oil companies it's clear to me that what we have to do is present the product to the consumer in an exciting way and at an affordable price. What I'd like to do is promote games with competitions and good PR rather than with inflated advertising claims.

"The winner of the *Lords of Midnight* contest, John McIntyre, was to have had this winning game transformed into a novel. That idea fell through, but what we're considering now is a role-playing game or fighting fantasy collection edition magazine instead.

"What we're trying to do is work through distributors like Comstock and Microbyte, who we think give a good service, and establish Beyond in such a way that the customers make a conscious decision to buy Beyond games because they know that they're high quality. A percentage of purchases will always be impulse buys, but we want to build up a regular following.

"We're trying hard to do things in a friendly way; the software industry isn't renowned for doing for doing things well, but we're getting there. ■

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CLUB SUCCESS

The Logic 3 Commodore Club was founded in September 1984 and has been a resounding success. The rapid growth of the Club has kept Logic 3's staff working even later a week just to keep up with demand. Logic 3's managing director and co-founder, Tony Taylor, explains the reasons for the Club's success. Taylor explains that the Club's success is due to the fact that it offers a wide range of products, including software, hardware, and services. He also mentions that the Club's success is due to the fact that it offers a wide range of products, including software, hardware, and services.

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Beefing up Basic

Chris Wittgenbe studies three extension packages for the 64

YOU WILL ALL, no doubt, have read time and again about how limited is the Commodore 64's Basic. CBM has taken a lot of work for not expanding the language when this otherwise fine computer was released. Having said that, we all wait out and bough one just the same, or perhaps it's not so bad after all. Looking on the bright side however, the lack of 'improved' commands has meant gainful employment for many a software genius, writing Extended Basic packages. There is now a multitude of these on the market at various prices and, one assumes, varying quality.

Disk version

One such package is *Breden's Basic* from Victoria Software, which comes with a manual and a copy of the program on both tape AND disk, so that when you buy the disk drive you've always provided yourself, you won't have to go out and buy the 'Disk version' of the software (involving more expense) you will already have it. Also, if you are lucky enough to be running disks, the tape is handy as a back-up in case of unforeseen disaster.

The program itself only uses about 16K so not only does it load in no time at all, even from tape, it also leaves plenty of room for you to do your own thing. The manual is well laid out and is divided into sections using 'release-cooked' index cards. Each command or function is detailed on a single page showing the Format, Parameters, and an explanation of exactly what it does. There is also a note at the bottom of each page listing keywords related to the one being described. I have to say that this really is the best manual I have yet come across. ALL the necessary information is

supplied, and it's easy to find and simple to understand. This is how manuals should (and could) be written. Enough preaching let's see if it lives up to expectations.

When the program is loaded you are presented with a title page confirming that you have *Breden's Basic* running and that you have 25555 Basic Bytes free. All commands can then be used as in 'normal' Basic.

The first group of commands concerns themselves with the creation and movement of Sprite graphics. There are 11 commands which enable you to do just about anything that you ever wanted to do with the little beastie including Expenses, Priority selection and Collision detection.

Sound chip

The next section has 10 extra commands related to the control of the screen and graphics characters, and includes the widely used PLOT, DRAW, HIRKS and COLOUR. I won't go into detail here as to do so would require taking over the entire magazine for this review, but suffice to say that with these commands at your fingertips there is almost nothing you cannot do when it comes to Graphics, colour, drawing lines and rectangles, multi-colour mode and User-defined graphics.

Sound is next, and there are 12 commands to help you get the best out of the 64's sound chip. Included are ENVELOPE, WAVE, PITCH and others that allow ready access to the delights of Ring modulation, Synchronization and Filter techniques.

Input/Output manipulation is one area where many people get stumped . . . including yours truly . . . but with *Breden's*

Basic there are 11 commands to make life a little less complicated when checking for Keyboard input, joystick direction or light-pen position. Disk commands are next . . . DERR for finding errors, DRR for listing files and DOS which has 10 variants for doing most jobs from Formatting onwards.

Functions

Number juggling can be difficult on the 64 but not with this program to help. There are 21 commands which ease the strain of Fractions, Hex conversions, Radicals, Bin testing and other mathematical nightmares. Four commands are included for error-trapping and 11 more under the heading of Programming Aids. These include assigning groups of characters to Function keys, memory Load and Save, saving parts of programs, key repeat and a 'quick forward entry' mode. When using this ALPHA facility, pressing the alphabet key with either the SHIFT or CTRL key will cause the computer to print the relevant keyword assigned to the key pressed, a list of which appears in the Appendix.

Next we have 11 Enhanced Programming Structures making Repetals, Loops, etc. much simpler using the WHILE . . . DO . . . ELSE, REPEAT . . . UNTIL format.

I was slightly disappointed to find that there are no AUTO, REMEMBER or MERGE commands . . . but there are 150 other useful ones! Apart from that small gripe, this is an excellent package and if you are looking for a Basic Extender then you MUST try this one out . . . and at £19.95 it's not expensive.

A cheaper Extension Pack is *Supabasic* from Intervision Micros. This one sells for less than £10 and has 12 new keywords. The



package consists of the program on cassette (that it doesn't take very long to load) and a booklet listing all the commands available. It is divided into eight sections, the first of which covers Graphics. The "usual" ones are here including HIRE, PILOT, DRAW and a rather nice WINDOW facility which allows you to display moving Text at the bottom of a HIRE screen.

The section on Sound only has five commands, while on VOLUME, ENVELOPE, WAVETONE, PULSE width and PLAY. While these may be sufficient for putting sounds in games, they leave something to be desired if you wish to be a little more adventurous on the music score.

The Programming Aid section has 12 extra commands including OLD, REMEMBER and REPEAT. There are four more to help in Error trapping and a KEY command which lets you define the Function keys with strings of characters.

Sprites

Sprites and User-defined graphics have a section all to themselves. The commands included will allow you to set up Sprites, move them about the screen and check for collisions; other Sprites/Sprite or Sprite/Background. There are six Input/Output commands provided by Superbasic covering Tape, Disk and Joystick operations. Easy manipulation of numbers and strings is accomplished by seven commands, including converting Hex to Decimal (and vice-versa) and reading the function keys. Memory manipulation only warrants four commands: DEEK and DORE for reading

and setting two consecutive memory locations and CEEK and COCEL for reading and placing characters in memory.

The last section is dedicated to screen control and has 10 commands to help with screen and border colours, screen scrolling and cursor positioning. Most of the 71 commands can be abbreviated; many of them to a single letter followed by a full stop. Although the manual is not what I would call comprehensive, it is adequate, bearing in mind the cost of the package.

If you can't afford (or don't need) one of the more elaborate Basic Editors, then this one is certainly worthy of consideration, especially as it costs no more than one good game.

Also called Superbasic (but this time split properly) is another package that sells for less than £10. This one is by Century Software and contains 16 extra Basic commands. The first thing that warns me to this piece of software is the note in the booklet explaining that it "resides in the 4K block from 1C000-1C1FF" and makes extensive use of the spare memory locations in pages 0 and 1 of the RAM; any program using those areas of memory may corrupt Superbasic! I wish more companies would tell us where their programs hide so that we could avoid making a mess of things when using those types of utilities while programming.

The first five commands we come across can only be used in immediate mode and not within a program. They are ALTO, DELAY, REMEMBER, OLD and PACK; all self-explanatory. The seven other utilities

are BEEK, DORE, PULSE, REPEAT, HIMEM for protecting an area of memory, AT (for placing the cursor at any screen position) and WOP (for asking word substitutions).

There are seven sound commands in Superbasic, and although none are concerned with King Mod or Syn, this program does assist in the use of Filters.

Graphics

Next come 11 commands for controlling the Graphics on the 64. There are two types of display: normal text, using 1000 bytes of memory and the two bit-mapped display which use 8000 bytes and have individually addressable pixels. Three of the commands alter the colours of the text display and the other eight control the high resolution graphics.

There are six more to help you set up your Sprites, move them about the screen and expand them both horizontally and vertically. Everything about this package is extremely well done; the software itself works, the examples given are very helpful and all the commands are sufficiently explained. Considering the price of the package, it is quite excellent.

When looking for a Basic Editor, we all have different requirements and different amounts of money to spend, but I will say that, whether you need something as comprehensive as Reader's Basic or whether you have set your sights on one of the more modest offerings, each of the three packages looked at here is worthy of a place on your short-list. ■

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JetSoft

the arcade people

Koala



Imitate the tiger

David Fox looks at the hardware which lets your computer capture images like that of the feline above — graphics tablets and light pens

THERE ARE lots of graphics software packages for the 486 and Vix which enable you to achieve satisfying results with the high-res multi-colour facilities of the machines. October's issue looked at many of these programs, and future articles will cover the latest graphics software. In this article we're more concerned with the hardware, which is becoming cheaper and easier to use all the time.

Just as an artist has his palette, the computer graphics programmer must sometimes feel the need for a solid surface on which to work, rather than the usual cursor keys or joystick, which give little feeling of "painting" on a 2-dimensional surface.

Until recently the only other option was the lightpen, and we'll be looking at one of these inexpensive, simple units, the Pixstik from CIB. First, though, two graphics "tablets": the Touchmaster, and Audio-genic's Koalagrip.

Touchmaster

Although graphics tablets have been in use for many years in various CAD (computer aided design) applications, it's only recently that the technology has become cheap enough, and the user base

wide enough, for it to be practical to design units intended for home computers. The latest on the market is the Touchmaster, which is produced by a company set up by ex-employees of Dragon Data, manufacturers of the Dragon Computers.

Touchmaster claims to be much more than just a graphics tablet; the advertising pushes it as a revolutionary new way of talking to your computer, avoiding the need to use QWERTY keyboards. Although this approach may be successful with computers like the Apple Macintosh, which use a "mouse", it hardly seems necessary to simplify even further the playing of games. In any case, Touchmaster comes supplied with a graphics software

package, and stores the games, educational and other utility "Touchman" packs aren't available yet, let's just consider it as a graphics tablet for the moment.

Brushes

Touchmaster has an A4 size control surface, over which is placed a thin plastic overlay printed with the control areas. The Touchmaster has its own mouse adapter, an interface cable to plug into the 486 or Vix 28's user port, a plastic stylus, and comes with a user guide and Touchware catalogue. Don't get up, possibly using a disk drive on the computer, the result is a spaghetti-like mess of cables.

Touchmaster also has a foot which rocks and serial port, though these are of no immediate use.

The multipoint program is loaded from tape or disk, and using the stylus on the overlay you can select all the options which are familiar from various pixel software-based graphics packages.

At the top of the screen appear the words BRUSH 0, 1, 2, 3, with a block of colour to the right of each number. Brush 0 is the background colour, while 1 and 2 are light-toned brushes which can be used in a variety



of style; dot, vertical block line, horizontal block line, and right or left diagonal. To change brush type you just press the appropriate box on the overlay with the style, and remove the pressure when the style you want is indicated on the screen.

Brush widths can also be selected in stages 1 to 8. There are several powerful shape commands, including two forms of Circle, and Polygons using from three to nine sides.

Fill allows you to colour areas bounded by lines, and there are also Line, Dot, Text, Zoom, Erase, Load and Save, and View (to restore the cursor) commands.

Touchmaster is a reasonable product, but widely overpriced for the market at over £128. Despite claims for the accuracy of the smoothed surface, the cursor movement seemed wobbly and slow. The overlay tends to slip or wriggle if too much pressure is applied.

Koolpad

Only if the forthcoming Touchware products show a good deal of originality and novelty will Touchmaster stand a chance of dominating the market.

The major rival is the Koolpad, distributed by Analogic, which as its name suggests is a small, costly graphics tablet.

Koolpad is more like A5 size, and is a handy wedge shape with two chunky control buttons. Beyond reactions to the software, which is currently available on cartridge, disk and cassette through the cartridge version is to be phased out) have made the Koolpad more happy with the PAL TV system — the original American NTSC-based version would draw stripes rather than true circles on UK TVs.

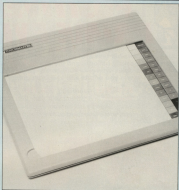
At £79.95, Koolpad is much closer to being a reasonable price for the occasional user. Moreover, the software doesn't suffer at all from not having the Touchmaster's overlay facility; the icon-based command display is easy to follow and makes selection of all the available options easy.

The pressure-sensitive surface of the Koolpad also seems to give quick and steady cursor movement, and connection is simple since no separate power supply is needed and the pad plugs into Port 1 on the 64. Once the command display is loaded, positioning the cursor in the DRAW text and pressing a control button gets you into draw mode. Move the cursor off the bottom of the screen and the screen blanks. You can then draw by pressing down a button and moving the cursor on the pad surface. Release the button and the drawing will stop.

Attractive

The menu consists of Command, Brush and Colour Palette sections. Commands include Circle, Line, Disc, Box and Frame, all of which have a Transport feature which allows part of a design to be moved to any part of the drawing screen.

There are eight different brush shapes, and 16 "patterns" in which you can paint as well as in the usual 16 colours. There are also Erase, Ray, Zoom, Fill, Erase, Copy and Ray commands, and even a Swap



The Touchmaster graphics tablet — advanced but expensive!

facility which makes it possible to take shapes from one screen, "A", and transfer them to another, "B".

Obviously there are also a full range of Save and Load commands, so your masterpieces can be kept for posterity.

Also included in the latest Koolpad packages will be a Koolprinter utility, which enables graphics to be hard-copied with a suitable dot-matrix printer.

Overall Koolpad is an attractive, efficient, fun product at a reasonable price. Educational and games software packages are promised, and since Analogic intends to manufacture the software itself in future there should be no supply problems. Highly recommended.

Budget

For the budget end of the graphics market, the PixStik has been introduced, this time by CBS. All software will be available on tape, in line with the budget price-range of light pens, and both 64 and Vic 20 versions will be available.

Light pens work by intercepting the screen raster position by calculating the elapsed time between the start of the scan and receiving the light signal. As you'd imagine, this method doesn't lend itself to great precision, and all light pens therefore tend to give wobbly results.

PixStik, which plugs into the joystick port, comes with a graphics program, Paintbox, and four games which are at most vague in demonstrating how the light-pens work: they are an entertainment.

The Paintbox program has a brush, colour and command menu display at the top of the screen, and XY coordinates for the crosshair position. The rest of the screen is a blank drawing surface.

The left hand shift key is used to action a command over the right box is selected with the crosshair sight. You have to move fairly slowly by the crosshair to keep up with the lightpen, which is the main disadvantage of the system. However, the range of commands is good, with background, line, rectangle, fill, circle and clear commands as well as a variety of brushes.

Uniquely, the Paintbox software features an Animator routine by which four images can be displayed in sequence to give a cartoon effect.

The PixStik manual is unusually comprehensive, including worked examples of drawing and animation (a house with smoke coming from the chimney) and details of how to use the lightpen in your own programs. On balance, although a lightpen is not such a satisfying graphics aid as a tablet, considering the pricing, which is under £85, it's certainly an option worth consideration by the impoverished computer artist.

For further details of these products, contact Touchmaster, PO Box 1, Port Talbot, West Glamorgan, G86-1AD; Analogic, IP Science Industrial Park, London Road, Reading, Berkshire, RG1 3AA; CBS Computer Software, Ashcroft House, 1-3 Kewstons Place, London, SE1-6PP 1277. ■



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64 star game: Jeff Minter



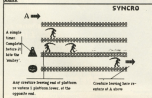
SYNCRO: a Game of Skill by Jeff Minter

1) A Brief Description of the Game.

SYNCRO is a test both of manual dexterity and quick thinking. You control the motion of a set of four conveyor belts. Along these belts are several Antipalps creatures. Each is running with a different velocity. Your aim is to manipulate the conveyor belts in such a way as to leave all the Antipalps running on the spot, each on a different belt. Moreover, you must do this so that each Antipalps comes to rest in a certain spot on each conveyor belt, the 'Syncro Zone'. Once all four Antipalps are static and within their Syncro Zone, you have completed that level; bonus points are awarded depending on how long you took, and the game proceeds to the next difficulty level.

2) A Look at the Screen Layout

The following diagram should help to indicate some of the game's vital points:



Using the joystick in controller port 2, you select which platform you want control of by moving the stick up and down (the selected platform pulsates). Once a platform is selected, its speed is controlled by left/right motions of the joystick. By varying the platform's speed, taking into



Winter's Syncro



FEW GAMES PLAYERS will need an introduction to Jeff Miner and Llanasoft. Since the earliest releases, Jeff's games have had a reputation for brilliant programming, manic invention and exceptional playability. Most have been influenced by the running theme of hairy animals — Mount Camels, Sheep in Space, and Anacidial, to name a few.

New York, the Hairy has written a 64 game specialty for Commodore Horizons. It features the Anacidials we all know and love, and presents the greatest challenge you'll ever have faced on your 64! The machine code program has been converted into Basic data statements by Kevin Bergin. When copying in the listing, which incorporates a checklist routine to minimize errors, follow the instructions in the introductory BASIC statements then carry on entering the rest of the program.

For a copy of the newsletter *Names of the Best*, send an S.A.C. to Llanasoft, 49 Mount Pleasant, Tully, Hants, RG26 5BN.

Turn to page 42 for SYNCRO



account the Anacidial's own velocities, you can control the positions and speeds of any creatures on your platform.

When an Anacidial is at 'syncro-zone', it will begin to pulsate. Get the beast static in the syncro zone, then move on to the next platform. The syncro zones can be in any position on the platforms. Keep an eye on the Anacidials passing through; you'll see them flash as they pass the zone.

Any Anacidial going off the end of a platform re-enters on the platform lower down, at the opposite end to the one it left. Beasts leaving the bottom platform re-enter at the top. Once all four Anacidials are stationary within Syncro Zones, that round is complete.

There are complications, however. The Platforms have a tendency to slow down. When they start to do this, any anacidial will, of course, begin in low station. On the higher levels of the game it is necessary to constantly tend to already-placed creatures when they start to drift.

You are also up against a time limit. If you don't achieve syncro before the 16-ton weight hits the smelly face, the game is over. The weight is reset at the start of each new round.

You may also press the 'syncro button'. When pressed, it sets the speed of the current platform to exactly the opposite of the first Anacidial it locates on the platform. The effect is to halt that Anacidial. It's useful if you need to position an anacidial quickly in the syncro zone; just press the button as it passes through. You can even use it on an already-static Anacidial if you think that the platform is just about to slow down. Pressing the button re-complexes the platform.

Take care with this control, though: you are only allowed 9 presses per round, and if there is more than one Anacidial on the current platform when you press, you may find that the platform matches the velocity of the wrong Anacidial!

The game has 10 levels. Each level consists of 4 rounds. Levels get successively harder in that the tendency for the platforms to slow down increases. You'll need to use the syncro button more often, and be quicker in your manipulation of the Anacidials or they'll soon drift off station.

You'll probably find that it'll take a little time to get used to the game because the concept is not one you've used to (see straightforward Up, Down, Left, Right, Fire!). The game is all the more enjoyable for its originality, and there's a nice bit of boogie wobble music in there to add to the enjoyment.

My best score to date is about 4500 odd, and I got to round 2, level 5. Good luck!

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```

10 REM *** A JEFF HENTER PRODUCTION ***
20 REM *** DATA CREATED COURTESY OF KEV
  IN BORKIN **
30 REM *** BEFORE ENTERING THIS PROGRAM
  ENTER THE FOLLOWING ***
40 REM *** IN DIRECT MODE: ***
50 REM *** F0KE 43,1:F0KE 44,44:F0KE 14
  384,0:CLR:INEM ***
60 F0KES3280,2:F0KES3281,7:PRINT"*****
  3300000000 PLEASE WAIT FOR A MOM...
  **
70 F0KAS=2049705028:READ:FORKEND,8:TT-T
  T48:INEM
80 IF TT<>278073THENPRINT"DATA
  ERROR":STOP
90 REM *** WHEN PROGRAM HAS FINISHED SA
  VE IT TO TAPE OR DISK AS A BASIC PROGRA
  M
100 REM *** IT CAN THEN BE LOADED AND R
  UN IN THE USUAL WAY GOOD LUCK!!!
110 F0KES3280,14:F0KES3281,6:PRINT"ALL
  FINISHED"
120 F0KE43,1:F0KE44,8:F0KE45,168:F0KE46
  ,17:F0KE47,168:F0KE48,17
130 F0KE49,168:F0KE50,174:F0KE51,0:F0KE5
  2,48:F0KE53,0:F0KE54,48:CLR:END
140 REM *** SOME OF THE ABOVE LINES ARE
  8 TOKENS TO FIT IN OCT ***
150 DATA1,8,1,0,128,30,48,54
160 DATA9,0,0,0,33,331,14,33
170 DATA208,16,167,0,141,4,212,141
180 DATA13,212,141,18,212,169,15,141
190 DATA24,212,141,12,212,141,5,212
200 DATA167,12,141,17,212,169,240,141
210 DATA13,212,141,4,212,169,118,141
220 DATA29,212,169,33,141,4,212,141
230 DATA11,212,74,74,8,0,294,232
240 DATA3,120,169,249,141,20,3,169
250 DATA8,141,21,3,169,24,141,24
260 DATA258,32,128,9,32,143,13,169
270 DATA0,141,42,13,141,44,13,141
280 DATA156,14,32,30,13,169,203,141
290 DATA21,208,169,87,141,39,7,32
300 DATA126,8,76,7,14,169,129,141
310 DATA25,208,141,24,208,169,240,141
320 DATA18,208,173,17,208,41,127,141
330 DATA17,208,88,74,173,229,8,240
340 DATA230,163,0,189,238,8,24,10
350 DATA157,238,8,189,238,8,42,157
360 DATA230,8,189,238,8,508,0,157
370 DATA208,8,252,224,8,208,220,124
380 DATA208,223,74,173,229,8,240,220
390 DATA162,0,189,230,8,24,166,157
400 DATA230,8,189,238,8,166,157,238
410 DATA8,144,8,189,230,8,9,138
420 DATA157,238,8,232,224,8,208,224
430 DATA134,208,221,74,2,70,207,7
440 DATA207,221,249,112,32,32,48,0
450 DATA40,121,223,220,70,76,49,224
460 DATA173,33,208,41,1,240,246,162
470 DATA8,32,37,9,32,0,11,32
480 DATA98,11,232,224,4,208,242,32
490 DATA214,9,32,221,10,32,16,12
500 DATA32,132,15,32,51,16,32,124
510 DATA8,74,49,224,128,72,24,10
520 DATA10,10,10,168,162,0,162,0
530 DATA5,157,220,8,208,222,224,14
540 DATA208,244,104,72,170,189,70,8
550 DATA41,228,208,123,189,70,8,143
560 DATA229,8,32,188,8,74,95,9
570 DATA189,70,8,72,228,24,108,1
580 DATA41,229,8,32,149,8,104,72
590 DATA10,10,10,170,140,1,188
600 DATA220,8,137,0,74,232,200,192
610 DATA18,208,244,173,220,8,137,0
620 DATA24,104,170,76,167,0,142,32
630 DATA208,142,33,208,149,32,157,0
640 DATA4,137,0,3,137,0,4,137
650 DATA0,7,169,1,137,0,214,157
660 DATA0,217,157,0,218,157,0,219
670 DATA222,208,228,162,0,169,128,157
680 DATA164,4,169,129,157,160,4,169
690 DATA130,137,68,3,169,131,137,69
700 DATA8,169,132,137,228,3,169,133
710 DATA157,229,3,169,134,137,132,6
720 DATA149,138,137,133,4,232,232,234
730 DATA22,208,210,74,217,12,5,208
740 DATA213,9,240,1,76,169,4,141
750 DATA219,9,173,116,14,208,240,32
760 DATA17,14,173,0,220,41,3,201
770 DATA2,240,27,41,1,240,8,238
780 DATA71,10,228,71,10,208,74,10
790 DATA73,71,10,201,208,240,240,201
800 DATA4,240,242,41,3,141,71,10
810 DATA74,71,10,173,0,220,41,12
820 DATA201,12,240,41,41,8,208,6
830 DATA254,70,8,254,70,8,222,70
840 DATA8,173,224,11,137,220,11,169
850 DATA8,187,224,11,189,70,8,201
860 DATA8,208,3,222,70,8,201,248
870 DATA208,3,224,70,8,76,3,3
880 DATA149,228,72,10,173,72,10,41
890 DATA13,170,32,182,13,189,208,10
900 DATA41,188,10,189,170,50,141,189
910 DATA10,173,71,10,208,72,10,208
920 DATA2,76,127,10,174,72,10,189
930 DATA222,10,133,222,189,226,10,133
940 DATA223,144,1,32,143,10,174,71
950 DATA10,189,222,10,133,222,189,226
960 DATA10,133,223,173,189,10,140,0
970 DATA48,220,208,192,32,208,249,173
980 DATA71,10,141,72,10,173,177,12
990 DATA240,14,172,177,12,189,189,10
1000 DATA141,32,208,141,33,208,224,177
1010 DATA12,74,169,0,141,32,208,141
1020 DATA23,208,74,12,3,0,4,2
1030 DATA4,3,3,7,1,3,7,3
1040 DATA3,4,3,4,0,0,0,11
1050 DATA11,12,12,12,12,1,1,1,12
1060 DATA15,12,12,12,11,11,144,68,228
1070 DATA22,214,217,217,218,1,206,220
1080 DATA10,240,1,74,169,3,141,220
1090 DATA20,74,74,10,181,80,175,80
1100 DATA60,72,92,124,7,4,3,2
1110 DATA1,3,3,4,138,10,168,189
1120 DATA240,10,153,0,208,189,249,10
1130 DATA153,9,208,188,7,12,189,223
1140 DATA10,187,39,208,189,245,10,41
1150 DATA224,227,11,12,208,4,173,189
1160 DATA10,187,39,208,187,3,14,249
1170 DATA6,222,3,14,74,100,11,188
1180 DATA245,10,24,122,1,1,1,21,70
1190 DATA8,187,248,10,189,245,10,41
1200 DATA240,201,44,208,10,32,228,11

```


1210 DATA169,240,157,245,10,208,12,201
1220 DATA0,208,6,32,208,11,169,80
1230 DATA187,245,10,222,171,11,240,1
1240 DATA94,189,1,11,72,41,128,240
1250 DATA07,104,73,288,34,105,1,72
1260 DATA104,41,7,73,7,24,205,1
1270 DATA187,171,11,204,179,11,189,179
1280 DATA11,201,194,208,5,169,192,157
1290 DATA175,11,189,173,11,137,248,7
1300 DATA189,1,11,41,138,240,1,94
1310 DATA189,175,11,24,205,4,157,248
1320 DATA07,94,4,1,2,173,173
1330 DATA194,193,189,70,8,240,13,41
1340 DATA208,208,4,222,70,8,222,70
1350 DATA8,284,70,8,74,222,220,11
1360 DATA208,250,169,225,157,220,11,222
1370 DATA224,11,208,240,149,5,187,224
1380 DATA11,208,218,189,214,187,52,5
1390 DATA2,2,3,189,249,10,24,100
1400 DATA22,187,249,10,201,188,208,5
1410 DATA69,60,157,249,10,254,7,12
1420 DATA89,7,12,41,2,887,7,12
1430 DATA69,3,187,3,14,94,8,1
1440 DATA2,2,160,64,94,92,3,173
1450 DATA18,14,208,241,169,0,141,15
1460 DATA2,162,0,160,0,189,245,10
1470 DATA41,224,217,11,12,240,7,200
1480 DATA92,4,208,241,240,44,189,7
1490 DATA22,123,247,194,247,208,240,188
1500 DATA7,12,169,0,24,123,1,11
1510 DATA21,70,8,240,13,201,225,208
1520 DATA07,189,1,11,41,138,240,12
1530 DATA208,7,189,1,11,41,138,208
1540 DATA2,228,13,12,222,224,4,208
1550 DATA186,173,18,12,201,4,240,1
1560 DATA94,224,169,32,141,177,12,228
1570 DATA4,12,172,44,12,201,4,208
1580 DATA18,169,0,141,44,13,228,45
1590 DATA2,173,45,13,201,10,208,3
1600 DATA204,45,13,32,35,13,169,1
1610 DATA41,69,14,169,57,141,59,7
1620 DATA69,201,141,28,58,169,64,141
1630 DATA28,14,169,33,142,30,14,169
1640 DATA20,141,27,14,32,20,14,94
1650 DATA0,0,17,25,14,3,18,13
1660 DATA22,57,32,18,13,21,14,4
1670 DATA22,48,32,32,13,0,32,0
1680 DATA2,32,48,32,32,32,19,3
1690 DATA22,28,3,32,48,48,48,48
1700 DATA48,48,162,0,189,179,12,187
1710 DATA22,7,222,224,4,208,245,162
1720 DATA60,169,134,187,70,7,169,138
1730 DATA87,71,7,169,4,187,70,219
1740 DATA27,71,219,202,202,208,224,162
1750 DATA0,189,89,16,187,113,7,189
1760 DATA27,16,157,153,7,169,7,127
1770 DATA22,219,187,113,117,222,224,38
1780 DATA208,221,94,1,2,223,220,2
1790 DATA222,2,4,2,4,222,222,4
1800 DATA222,4,7,0,0,222,192,160
1810 DATA228,112,94,80,44,32,160,0
1820 DATA74,44,12,189,28,13,141,1
1830 DATA11,189,32,13,141,2,11,189
1840 DATA6,13,141,3,11,189,40,13
1850 DATA41,4,11,32,173,16,141,11
1860 DATA2,32,173,16,141,13,13,32
1870 DATA73,16,141,13,12,32,173,16
1880 DATA141,14,12,174,45,12,189,46
1890 DATA2,141,204,11,189,80,16,141
1900 DATA21,15,173,45,13,24,108,48
1910 DATA41,59,7,173,44,13,24,105
1920 DATA40,141,47,7,94,38,149,32
1930 DATA41,8,208,141,10,208,141,142
1940 DATA3,141,9,208,169,165,141,11
1950 DATA208,149,208,141,222,7,149,201
1960 DATA41,222,7,169,12,141,42,208
1970 DATA69,7,141,44,208,94,224,15
1980 DATA208,222,173,116,14,240,3,74
1990 DATA208,16,173,89,14,208,228,228
2000 DATA42,13,173,142,13,201,149,245
2010 DATA4,141,9,208,74,169,165,141
2020 DATA42,13,141,9,208,141,114,54
2030 DATA69,202,141,222,7,169,32,141
2040 DATA77,12,169,129,141,29,16,169
2050 DATA99,141,27,14,169,174,141,38
2060 DATA6,169,16,141,25,16,32,30
2070 DATA6,94,0,0,0,0,173,177
2080 DATA2,208,18,173,116,14,240,10
2090 DATA73,0,220,41,16,208,3,74
2100 DATA74,8,173,89,14,240,221,173
2110 DATA8,13,208,162,4,228,142,13
2120 DATA73,142,13,141,9,208,201,149
2130 DATA40,32,180,73,138,73,32,90
2140 DATA4,104,170,104,168,169,0,133
2150 DATA228,190,228,208,224,74,38,14
2160 DATA69,32,141,142,13,141,9,208
2170 DATA69,0,141,89,14,74,7,14
2180 DATA0,138,73,284,65,7,189,65
2190 DATA7,201,58,208,8,169,48,157
2200 DATA5,7,202,208,208,104,170,136
2210 DATA208,221,94,0,173,177,12,240
2220 DATA,94,173,0,220,41,14,208
2230 DATA208,173,39,7,201,48,240,241
2240 DATA208,39,7,169,14,141,177,12
2250 DATA169,32,141,29,16,169,51,141
2260 DATA27,16,169,128,141,25,16,169
2270 DATA140,141,28,14,32,30,14,162
2280 DATA0,172,71,110,152,321,7,12
2290 DATA240,7,222,224,4,208,244,240
2300 DATA22,189,1,11,73,288,34,108
2310 DATA1,253,70,8,189,1,11,41
2320 DATA128,240,8,180,170,222,70,8
2330 DATA173,204,11,153,220,11,169,5
2340 DATA123,224,11,94,173,14,220,41
2350 DATA224,141,14,220,165,1,41,221
2360 DATA133,1,162,0,160,0,189,0
2370 DATA208,192,7,208,2,41,15,157
2380 DATA0,32,189,0,209,197,7,208
2390 DATA2,41,15,187,0,32,200,182
2400 DATA41,7,168,202,208,224,162,0
2410 DATA189,32,13,187,0,38,187,14
2420 DATA26,187,32,36,157,44,36,232
2430 DATA224,14,208,224,145,1,9,4
2440 DATA133,1,173,14,220,9,1,141
2450 DATA4,222,94,64,204,94,127,57
2460 DATA17,17,31,2,31,132,284,124
2470 DATA26,136,204,4,4,4,4,2
2480 DATA5,2,4,4,7,7,7,8
2490 DATA8,9,10,11,11,12,13
2500 DATA4,14,15,16,17,18,19,21
2510 DATA22,23,48,112,180,221,71,182
2520 DATA227,71,167,12,119,223,97,222
2530 DATA04,247,143,48,218,143,98,24
2540 DATA228,210,198,198,229,229,31,94

2550 DATA181,4,10,83,304,130,15,340
 2560 DATA1,96,173,132,15,301,96,300
 2570 DATA2,149,0,141,132,15,170,230
 2580 DATA133,15,188,189,15,189,48,15
 2590 DATA141,1,312,141,8,212,100,99
 2600 DATA15,141,0,312,100,4,141,7
 2610 DATA212,173,131,15,141,130,15,96
 2620 DATA0,12,4,14,7,19,4,14
 2630 DATA0,12,7,19,3,19,4,14
 2640 DATA0,12,4,14,7,19,9,21
 2650 DATA0,33,9,21,7,19,4,14
 2660 DATA0,17,9,21,12,34,14,35
 2670 DATA13,37,14,35,13,34,9,21
 2680 DATA0,12,4,14,7,19,9,21
 2690 DATA12,34,10,32,9,21,7,19
 2700 DATA7,19,11,32,14,34,16,38
 2710 DATA5,17,9,21,12,34,14,35
 2720 DATA0,12,4,14,7,19,4,14
 2730 DATA0,12,7,19,7,19,7,19
 2740 DATA4,244,20,0,31,149,0,141
 2750 DATA18,212,173,29,16,141,15,212
 2760 DATA141,26,16,173,29,16,141,15
 2770 DATA212,96,173,29,16,240,300,173
 2780 DATA26,16,34,149,37,16,141,15
 2790 DATA212,141,26,16,204,30,16,200
 2800 DATA232,149,14,141,18,212,96,10
 2810 DATA9,8,7,4,5,4,3,2
 2820 DATA32,7,18,3,5,20,9,14
 2830 DATA7,19,32,4,18,15,13,32
 2840 DATA25,1,11,32,20,8,5,32
 2850 DATA8,1,9,18,25,32,20,13
 2860 DATA32,1,12,12,32,32,32,32
 2870 DATA32,32,12,9,11,5,48,13
 2880 DATA9,14,4,5,4,32,8,21
 2890 DATA13,1,14,13,9,4,32,8
 2900 DATA14,20,9,20,9,3,19,32
 2910 DATA32,32,32,32,44,94,138,140
 2920 DATA192,96,128,140,238,177,16,173
 2930 DATA59,325,41,7,148,185,145,16
 2940 DATA96,173,9,208,301,140,208,4
 2950 DATA169,149,141,9,208,96,149,145
 2960 DATA141,9,208,96,145,0,189,229
 2970 DATA16,157,0,48,189,229,17,157
 2980 DATA0,49,189,229,16,157,0,50
 2990 DATA232,208,238,96,0,280,138,7
 3000 DATA225,246,14,0,14,30,0,0
 3010 DATA1,128,0,127,340,0,349,252
 3020 DATA0,99,254,0,7,126,0,14
 3030 DATA127,0,14,127,0,12,127,0
 3040 DATA0,127,0,0,237,128,0,237
 3050 DATA128,1,193,192,1,193,192,3
 3060 DATA193,234,3,158,234,15,129,224
 3070 DATA31,3,192,158,0,280,129,7
 3080 DATA225,246,14,0,14,30,0,0
 3090 DATA1,128,0,127,340,0,349,252
 3100 DATA0,99,254,0,7,126,0,14
 3110 DATA127,0,7,127,0,8,127,0
 3120 DATA0,127,0,0,119,128,0,251
 3130 DATA128,0,251,192,0,225,240,0
 3140 DATA234,112,0,234,240,3,224,96
 3150 DATA3,204,0,158,0,225,128,7
 3160 DATA225,246,14,0,14,30,0,0
 3170 DATA1,128,0,127,340,0,349,252
 3180 DATA0,99,254,0,3,126,0,7
 3190 DATA127,0,7,127,0,8,127,0
 3200 DATA0,127,0,0,127,0,0,254
 3210 DATA0,1,248,0,0,280,0,0
 3220 DATA63,128,0,39,128,0,120,0
 3230 DATA0,248,0,158,0,15,248,0
 3240 DATA232,20,7,192,0,14,0,0
 3250 DATA63,128,0,31,240,0,127,282
 3260 DATA0,251,254,0,99,126,0,7
 3270 DATA127,0,14,127,0,12,127,0
 3280 DATA0,127,0,0,127,0,0,254
 3290 DATA1,1,254,0,3,238,0,31
 3300 DATA143,0,18,7,0,8,7,0
 3310 DATA0,15,0,158,1,255,0,31
 3320 DATA138,224,112,0,112,0,120
 3330 DATA0,1,204,0,15,204,0,62
 3340 DATA129,0,127,198,0,124,224,0
 3350 DATA224,112,0,224,112,0,224,48
 3360 DATA0,224,0,1,199,0,1,199
 3370 DATA0,3,131,128,3,131,128,7
 3380 DATA3,192,7,1,192,7,129,240
 3390 DATA2,192,248,128,1,220,0,31
 3400 DATA138,224,112,0,112,0,120
 3410 DATA0,1,204,0,15,204,0,62
 3420 DATA129,0,127,198,0,124,224,0
 3430 DATA224,224,0,224,224,0,224,192
 3440 DATA0,224,0,1,228,0,1,231
 3450 DATA0,3,231,0,15,120,0,14
 3460 DATA7,0,13,7,0,8,7,192
 3470 DATA0,7,192,158,1,225,0,31
 3480 DATA135,224,112,0,112,0,120
 3490 DATA0,1,204,0,15,204,0,62
 3500 DATA129,0,127,198,0,124,192,0
 3510 DATA224,224,0,224,224,0,224,96
 3520 DATA0,224,0,0,224,0,0,127
 3530 DATA0,0,31,128,0,255,0,1
 3540 DATA222,0,1,220,0,0,30,0
 3550 DATA0,31,0,158,31,240,0,120
 3560 DATA63,0,0,3,224,0,0,112
 3570 DATA0,1,222,0,22,204,0,62
 3580 DATA224,0,127,202,0,124,198,0
 3590 DATA224,224,0,224,112,0,224,48
 3600 DATA0,224,0,0,224,0,0,127
 3610 DATA0,0,127,128,0,119,192,0
 3620 DATA241,248,0,224,240,0,224,96
 3630 DATA0,240,0,158,0,124,0,0
 3640 DATA231,0,0,192,0,0,231,0
 3650 DATA0,128,0,1,220,128,1,220
 3660 DATA128,3,220,192,3,120,192,7
 3670 DATA19,224,7,112,224,15,117,112
 3680 DATA15,120,240,31,220,248,31,220
 3690 DATA248,49,120,76,29,102,92,122
 3700 DATA204,110,123,107,118,29,120,71
 3710 DATA220,220,220,128,0,0,0,0
 3720 DATA0,0,0,0,0,0,0,0
 3730 DATA0,0,0,0,0,0,0,0
 3740 DATA0,0,0,0,0,0,0,0
 3750 DATA112,0,3,224,0,18,220,128
 3760 DATA30,118,192,31,119,192,43,220
 3770 DATA224,22,220,94,22,222,192,28
 3780 DATA32,192,15,143,128,3,224,0
 3790 DATA0,112,0,128,0,0,0,0
 3800 DATA0,0,0,0,0,0,0,0
 3810 DATA0,0,0,0,0,0,0,0
 3820 DATA0,0,0,0,0,0,0,0
 3830 DATA112,0,3,224,0,18,220,128
 3840 DATA30,115,192,29,223,192,43,220
 3850 DATA224,42,143,224,28,1,192,24
 3860 DATA112,192,12,249,128,3,224,0
 3870 DATA0,112,0,128



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TOWER OF ADVENTURE

The rules of Conway's castle

At last, a Commodore adventure column. Dungeon mistress Barbara "The Barbarian" Conway sets the scene . . .

WHEN IT COMES to computer gaming, enthusiasts tend to divide into two camps — the shoot-'em-ups and the adventures. There is, admittedly, some degree of overlap between the factions but, for the most part, devotees of rapid-fire arcade games tend to prefer to control their reflexes, while adventure addicts stretch their brains. After which high-minded opinions, you won't have much difficulty guessing that my own inclination is very much more towards a floppy game than reaching up 128,000 points on "Atlan-Sple".

Unfortunately we editors after adventure have not, up to quite recently, been all that well served for on the Commodore front. The best games available have tended to be avatars, using the machine's fascinating sound and graphics facilities, apart from a few excellent (and prohibitively expensive) adventure games from the likes of Infocom across the Atlantic. Now, however, thanks to a few enterprising UK software houses and at least one remarkable utility for word-to-gamescreen, that has changed dramatically.

Logical

Offerings from two of those notable software houses, Level 9 Computing and Melbourne House, are amongst this month's reviews, but before I get onto them, let me take a quick look at the vexed question of what makes a good adventure. That is, of course, a highly individual judgement. But, since this individual is doing the judging, you might as well know what her prejudices are to start with.

Rule One, which must NEVER be broken, is simple. All good advice on what is logical. That doesn't mean that obvious such as magic isn't to be used. It just lays down that, given an environment whether of time-travel, space exploration, sorcery or whatever, it must always be possible to think your way through a situation once you understand where you are. Thus a game which, say, bars you with a discover and expects you to guess that the way to escape is to turn three corners

and stick out your tongue is not being logical. On the other hand the solution to getting a warm coat in a Level 9 adventure, lightening a woolly mammoth with a mouse so that it jumps out of its skin and runs away, is logical. Silly, but logical.

Which brings me to Rule Two: A good adventure should show imagination and a sense of humour. The number of "adventure" games which consist of just trudging around a pitiless killing trap, poking up gold and repeating the odd dumber in dialogue is legion. They tend to be just about as much fun as doing the washing-up. It is possible to inject some levity into a classic " Dungeons and Dragons"-type story like the original masterpiece Adventure had plenty of whimsical touches but a disturbing number of those on offer just don't seem to think it necessary to do much more than "Go North", "Click Two" etc. Showing us a fight of two in a rain storm to find things so far off kilter things off.

Rule Three may look like a subset of Rule One: Adventures should not be able to only do dumb luck. Thus a game, such as *The Valley*, in which combat with snakes is frequent and the outcome depends entirely on random chance, is regarded with suspicion. Fighting is acceptable, although some superb adventures manage without quite neatly, but the adventure should have to rely on judgement to some extent, even if only in choosing which weapon to wield, how to fight or an option to talk first/last way out.

Concise

Rule Four is obviously pertinent where I am concerned: Adventures should damn well not assume automatically that the adventure is mine. I resent having to re-use dialogue so often. Why can't I have the option of coming to the assistance of a good-looking girl occasionally?

Lastly, Rule Five concerns screen lay-out. A text adventure should not good consisting background and character always, while a graphics adventure should always give the option to turn off the pictures. However good the story, if the text is

difficult to read then after a time it's a choice between giving up or ridding a splitting headache. And, where graphics are concerned, you can go off pretty pictures, however well drawn, if you keep on having to wait for the same dialogue some to fill the screen. And here, I repeat to say, are not even that pretty and take far too long to appear anyway.

You may notice that the five rules don't specify a computer gaming program (in a language interpreter which can cope with multiple instructions) since it is possible to have quite reasonable adventures even using the standard two word "verb followed by noun" format. But it's nice to have a good parser, and I have never understood the reason for programs that force you to guess which instruction they will accept, if the adventer vocabulary is very large, those screens can still be given a handy list of a veritable command to get them started.

Sherlock

When it comes to large vocabularies and verbose parsers, *Melbourne House* adventures have very few rivals. *Melbourne*, it was, which stayed aware trend in illustrated adventures with its classic *The Hobbit*, and the latest spin from this source can only help to enhance its reputation. *Sherlock*, based on a historical whod-mystery investigated by the famous detective, features graphics, sound effects, and "character independent" speech which goes considerably further than *Ultima* therein used to sit down and sing on so provocatively in *The Hobbit*.

Dismissed off in the parlour of 221B Baker Street and, after the adventure is set in evidence, with an on-screen clock, you'll need to do a bit of exploring of your own pardon before the faithful Watson, who is naturally there too, gives you the spin to action. Commands can be complex, using the Melbourne house "logical" language, which can come in handy as the moments tick away.

Time really is of the essence. On my first few trials, when I eventually got to the scene of the dastardly crime (or, to be more accurate, crimes, since so far I've come



across three murders including my own that ignorant flatfoot Inspector Lestrade had arrested the wrong person and refused to listen to reason. One of the joys of English is that, with people less obtuse than Lestrade, you can discuss reasons, ask questions or even get them to do things for you. Of course Watson, dear devoted old butler that he is, doesn't show much independent intelligence, but then he wouldn't would he? He does, however, come in very handy for carrying things and once you've said "follow me" to him, he sticks with you.

Victorian

It's terrific fun, the graphics are rapidly-drawn in a small window and can be switched off, and there are some very fascinating sound-effects which add to an admirable sense of the Victorian period, steam trains, horses carts and all. But, although programmer Philip Mitchell and his team have done an admirable job, there are still plenty of irritating (and a few glorious) bugs. Worst of these is the fact that, so massive is the program, there was no room for a routine to explain that you are carrying too much to take anything else. Thus it is perfectly possible to see a pistol in a room, try to take it, and be told that there is no pistol there! And I mentioned being told, when I went into the library and tried to look at the books "I see no bookcase". Also, although you can save a game on tape (there is a print-out facility on the Spectrum but not for the C64) save you "quit" you have to reload the cassette to start another game.

But don't let that put you off, the program as a whole is a treat. I haven't unravelled the whole mystery yet, and at the moment I'm lurking, disguised as a Chinaman, outside a house in Leatherhead, while Watson is following a principal suspect for me. I may let you know more about developments soon. But, in the meantime, investigate for yourselves. After all, my dear chap, you know my methods . . .

It turns out that *Melbourne House* is spelling us across this winter. Not only do we get the mystery and suspense of *Shogun*, but they also provide us with the considerably more varied, but no less intriguing, atmosphere of *Hampstead*. This adventure, incidentally, is its own branch of *Rain Forest*, since the aim of the game is to become a "Hampstead Man", and the entire game is as male-chauvinist as they come. Alas, it's also wickedly funny and highly original. No dragons here (unless you count the marauding gangs of traffic warden) but the spectre of social disgrace is every bit as terrifying as the prospect of battle with a troll.

Business

The opening scenes are distinctly reminiscent of *Lifeline Upstart* and your very first action, as you find yourself in the depressing lounge of your dingy flat with a television showing "3-2-1" in the corner, should indicate how high you are to "attain" *Hampstead*. It's not just a matter of finding it, that's a check. But before you are accepted there you must have cleared your way up the social ladder, progressing from a pathetic start (and be VERY careful at the beginning or you'll wind up with a criminal record before you've even got going) as solo-guess fiddler, through various stages of increasing smarts and deviousness. Final success finds you fitting naturally into *Hampstead* life as a dedicated Guardian crossword-solver, jogger and Yacht-clubber with three children at least, one of whom is called Tarquin.

This is very-odd, and fairly simple "verb-noun" text at that, but you can do a lot with it. Locations vary from your flat (and remember that most you've left it you can't return there) through the seedy parts of North-West London to the West End, and thence, if you play your cards right and don't get caught in a highly risky manoeuvre, via the corridors of power to the Ultimate Goal, *Hampstead* itself. This game plays its own obnoxious logic totally as far as I have been able to get on, and as a former resident of *Hampstead*, I can only say that if authors Trevor Laver and Peter Jones show their faces near the top of Kewley Hill, some intelligent citizen is likely to see his marauding Afghan Hounds on them, and

quite right too.

Hampstead, incidentally, is one of many adventures to be written with the aid of Giboff's excellent *Quill* program, a utility which takes much of the technical graft out of putting together a text-only game and lets the writer concentrate on producing an imaginative plot.

Imagination has never been a problem for the Level 9 Computing team. Return to *Lifeline*, the second in that company's *Shogun*-ball trilogy, while graphics to the marvellous level for the first time. The plot has you, agent Kim Kimberley, struggling both to save yourself from unjust accusation after being framed for a terrible crime, and fighting massive, and often bizarre, odds to rehabilitate the robot-dominated City of London on the planet of *Lifeline* and save your own skin.

Ferrets

Before you get anywhere near the city you'll face off if you survive perils ranging from a liposuctioned panter through a riddling poem to the dreaded madhouse (no, don't go) and if you actually make it into *London* you may find that the political-type skills you acquired in *Hampstead* come in very handy. Every puzzle on *Lifeline* has a solution, but lateral thinking is very much the name of the game. If you're desperate *Level 9* will supply a comprehensive cheat-sheet.

The command format is basically straightforward but the vocabulary is massive. Once into the game you'll be hooked, but *Level 9* has made an uncharacteristic blunder at the start. Without a great deal of blind luck you'll probably be tried by the judges of the wonderful standing alone. Immediately so I have no competition in telling you the following: Once you've left the crashed plane then go "E DEG D D D D D E S WAIT". Now you're on your own.

Barbara will be naming a most help service for the study department who have got stuck in an adventure. Write to: *Times of Adventure at Commodore Street, London*, and they'll try to deal with popular problems through the column. Sorry, but we cannot enter into individual correspondence.



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Graphs and the C16

David Lawrence continues last month's look at programming Commodore's new micro

Lines 3100-3120: Since there can be up to three banks, there need to be up to three names for the horizontal axis, or x-axis, rate, cost, profit. Note that the names have to be put into the array NYS (Name of Y-axis) from element zero. This array is not dimensioned in the initialization routine because it will only ever have three elements. Simply reentering the array name in the program, automatically sets up the array with 30 elements (0-29).

Lines 3130-3150: The user is requested for input, for each bank, the data for the number of columns specified. The number input is checked to ensure that it will not move the graph above the 19-line mark. The purpose of the loop at 3140-3150 is to ensure that no figure is entered which would require a graph taller than 19 character spaces on the screen.

Testing

Enter the following lines (eventually some will become part of the control module) for the program:

```
NEW COLS=200
END COLS=200
END COLS=200
```

Now RUN the program you have entered so far and answer its questions as follows:

```
For the number represented by each vertical axis: 1
Columns: 2
Name for horizontal axis: (REPRESENTATIVE)
Name for vertical axis: (PERCENT)
Bank 1, value: 10
```

After the entry of the last figure, the screen will clear and the program stop with the message READY. Now enter:

```
CALL DRAWGRAPH(1,2,1,1)
END
and the result should be:
// HORIZONTAL REPRESENTATIVE //
```

You can, if you wish, RUN the program again and by entering false values. You should now be able to enter any column value which is more than 19 lines the value of a single unit on the vertical axis.

Like the line graph, Module 2.3.3 needs a framework to be drawn before the information it presents becomes meaningful. The task is accomplished by the present module, which uses loop variables and the CHAR command to position low resolution characters at the correct positions on the screen.

Continuity

Lines 4050-4070: This loop prints a line of 30 inverse brown spaces to provide the

base on which the graph will stand. The graphic character is obtained on the Y key.

Line 4080: A line across the top of the screen, consisting of the graphic character on the P key 30 times.

Lines 4100-4110: The vertical lines at each end of the graph, marked for each unit. Graphic characters are on L and P keys.

Lines 4130-4150: Four lines across the graph representing units of five on the vertical axis. **Line 4160:** The horizontal axis label.

Lines 4170-4220: These loops print the numbers for the vertical axis down the right hand side of the screen, together with the value which each unit represents. Note the

use of MID\$ to extract a single character from CHR and print it, thus changing the colour of what is printed. The colour of each unit will correspond to the colour of one of the banks. Using CHR in this way allows us to specify any sequence of colours easily — simply alter the control characters in the string.

Line 4230: This line marks the left hand vertical axis using only cursor control characters rather than a loop and CHAR.

Testing

Enter one more line:

```
END COLS=200
and now RUN the program. Specify the unit value, one column and three banks. Give the three names for the vertical axis. When asked to specify the value of the columns, you need only press RETURN. You should then see the graph framework displayed, with the horizontal axis name at the bottom and the vertical axis names printed at the top right.

```

Module 2.3.4 draws the graph. This is a module which is, frankly, easier to understand once it has been entered and you can see its effect. The module is based not so much on broad principles but on the results of experimentation to see which combinations of characters, printed in which positions, provided the desired effect.

```
3000 REM *****
3010 REM ACCEPT DATA
3020 REM *****
3030 SCHLR
3040 CHR$(14,1,"(NYS CH1RED)GRAPH" ); PRINT
3050 PRINT "C003(BLK)THERE WERE 19 UNITS *VERTI
CALLY,"
3060 INPUT "C003(BLU)NUMBER REPRESENTED BY PER
CHUNIT:";U
3070 INPUT "C003(COL)NBS*(1-6):";ND
3080 INPUT "C003(BNK)P*(1-3):";PB
3090 PRINT "C003(*)*****
*****"
3100 INPUT "C003(RED)NBS*FORM*HORIZONTAL*W*IS
";N100
3110 FOR I=0 TO ND-1
3120 PRINT "C0R(N)NBS*FORM*VERTICAL*W*IS";I+1;
+INPUT NYS(I);
3130 NEXT I
3140 SCHLR
3150 FOR I=0 TO ND-1
3160 FOR J=1 TO ND
3170 T=20*U/I; DO UNTIL T/UWC=19
3175 PRINT "C003(INPUT)BNK";I+1;"*VALUE";J;"
";
3180 INPUT T
3200 IF INT(T/UWC)>19 THEN PRINT "C003(VAL)UET00
91104,"
3210 LOOP
3220 HX(I,1,1)=T
3230 NEXT J;I
3240 RETURN
```

```

1000 *****
1010 PRINT USING #PRINT;
1020 *****
1030 *****
1040 *****
1050 *****
1060 *****
1070 *****
1080 *****
1090 *****
1100 *****
1110 *****
1120 *****
1130 *****
1140 *****
1150 *****
1160 *****
1170 *****
1180 *****
1190 *****
1200 *****
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1800 *****
1810 *****
1820 *****
1830 *****
1840 *****
1850 *****
1860 *****
1870 *****
1880 *****
1890 *****
1900 *****
1910 *****
1920 *****
1930 *****
1940 *****
1950 *****
1960 *****
1970 *****
1980 *****
1990 *****
2000 *****

```

Commentary

Lines 3000 and 3100: This loop creates the number of banks specified. **Lines 3500 and 3400:** The second loop will create the number of columns specified.

Line 3600: The start position for drawing each separate column. The position will start at the far right of the number of columns and move nine spaces to the left for each new column. In addition, when one bank is finished, the next bank of columns will be printed one space down and to the right of the last.

Lines 3870 and 3130: These lines create a dummy loop to default around the screen which draws a column if the value for that column is zero — the loop is a dummy one because it is never executed more than once in any circumstances.

Lines 3900-4100: The loop which draws the main part of the 3-D column. The loop variable is set to move from one to the height of the column. On the first pass through the loop, the base of the column is created — a character from COS is used to move from the bottom of the base to the colour of the current bank. On subsequent passes, different characters are used to represent the side and front of the column as it is built up.

Note that the upward movement of the printing is created by the use of cursor control characters rather than the use of CHAR to position the printing. To use CHAR would mean that we would always have to know where we were on the screen.

```

2000 *****
2010 *****
2020 *****
2030 *****
2040 *****
2050 *****
2060 *****
2070 *****
2080 *****
2090 *****
2100 *****
2110 *****
2120 *****
2130 *****
2140 *****
2150 *****
2160 *****
2170 *****
2180 *****
2190 *****
2200 *****
2210 *****
2220 *****
2230 *****
2240 *****
2250 *****
2260 *****
2270 *****
2280 *****
2290 *****
2300 *****
2310 *****
2320 *****
2330 *****
2340 *****
2350 *****
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2870 *****
2880 *****
2890 *****
2900 *****
2910 *****
2920 *****
2930 *****
2940 *****
2950 *****
2960 *****
2970 *****
2980 *****
2990 *****
3000 *****

```

Using the cursor controls we only have to know where the column starts, then move relative to that until the top of the column is reached.

Line 3100: The top of the column is added. **Lines 3360-3130:** When the columns are finished there are some empty edges left at the bottom, these lines create them up.

Testing

Enter a new line
and compile and

and RUN the program. Specify a unit value of one, three columns and three banks. The names for the axes are unimportant, so make your own choice. After prompted for the values of the columns, enter the following:

3 3 3 3 3 3 3 3

You should now see the three banks and three columns clearly displayed, with the tops of each of the three columns appearing to make a smooth surface from the rear bank to the front. Note that in reading the values for the three banks, you must assume that the top of the front-most bank continues back and up to its next most position. In the example on the screen, what you have is three columns, with the three bars in each column representing the

```

3000 *****
3010 *****
3020 *****
3030 *****
3040 *****
3050 *****
3060 *****
3070 *****
3080 *****
3090 *****
3100 *****
3110 *****
3120 *****
3130 *****
3140 *****
3150 *****
3160 *****
3170 *****
3180 *****
3190 *****
3200 *****
3210 *****
3220 *****
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3240 *****
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3850 *****
3860 *****
3870 *****
3880 *****
3890 *****
3900 *****
3910 *****
3920 *****
3930 *****
3940 *****
3950 *****
3960 *****
3970 *****
3980 *****
3990 *****
4000 *****

```

same value, though the front bar is physically lowest on the screen. This is necessary to preserve the illusion of three-dimensionality.

Experimented with the program to see how it deals with differing data values. You will find that it will only really work for data where a bank is never higher than the one behind it.

Module 2.3.1 stores data on-disk or tape.

Commentary

Line 1000: One thing to note about the PRINT # statement is the presence of a number of BS in the line. You may remember that in the first module of the program, BS was set equal to CHR\$(10), which is the RETURN character which signifies the end of an item to be printed. When printing several items to a file from a single PRINT # statement, unless BS is included in between the items being printed, all the items will be run together. The actual variables printed to the file are simply some of the important values which were input in the second module of the program.

```

4000 *****
4010 *****
4020 *****
4030 *****
4040 *****
4050 *****
4060 *****
4070 *****
4080 *****
4090 *****
4100 *****
4110 *****
4120 *****
4130 *****
4140 *****
4150 *****
4160 *****
4170 *****
4180 *****
4190 *****
4200 *****
4210 *****
4220 *****
4230 *****
4240 *****
4250 *****
4260 *****
4270 *****
4280 *****
4290 *****
4300 *****
4310 *****
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4330 *****
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4370 *****
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4670 *****
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4690 *****
4700 *****
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4880 *****
4890 *****
4900 *****
4910 *****
4920 *****
4930 *****
4940 *****
4950 *****
4960 *****
4970 *****
4980 *****
4990 *****
5000 *****

```

Line 1000: In the commentary on the last line it was stated that BS (or some other suitable equal to CHR\$(10)) had to be included to separate the items. So why is it not done in the case of these two loops, which print the contents of two arrays to the file on disk? The answer is that whenever a PRINT # statement is automatically followed the last item printed with a RETURN character — that is why items are printed on separate lines of the screen if the preceding item does not have a comma or semi-colon on the end.

Lines 1000-1100: Note that we do not have to use the BS separator when INPUTTING data. It is in the nature of INPUT and INPUT # that they do not recognise that they have received an item of data until either RETURN is pressed or a RETURN character read from the disk.

Module 2.3.8 is the control module. Again, you have already entered many of the lines of this module in building up the test procedure on the program. All that remains is to ensure that the module is completed by checking against the listing.

Testing

Simply RUN the program. You should now be able to input the data for a graph. When the graph has been displayed, pressing any key will result in the prompt for saving the data. If you respond Y, then RUN the program again and answer Y when asked if you wish to load from disk. You should now see the same graph displayed. ■

The Working Commodore 64

Essential routines and applications

David Lawrence



This article is based upon an extract from *The Working Commodore 64* by David Lawrence. It is published by Newnes Books and costs £2.95.



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Compunet is up and running — but at what cost to the user?

A first impression of Commodore's network system by John Cochrane — can you afford to join Compunet? Or can you afford not to?



COMMODORE'S new Compunet system is now on line, and the first users are finding their way around the service. Owners of the 64 can, for £100, get a Compunet modem and one year's subscription to allow them to make full use of the facilities. Added hours designed to get the ball rolling have included free software and free mail service within Compunet, computers, and free facilities to leave messages and programs in the public user area. By the time that you read this however some of these offers will have ended. The free software includes Viewdata for Protext. Commodore claims that their Compunet modem can be used to give full access to Protext and Microtext, although you will have to pay additional subscription charges for these.

Telephone

But what is Compunet and what does it do? Essentially it is a telephone-based communications system which allows a Commodore 64 to be used to talk to a central mainframe computer, and access some of the facilities of that computer. These facilities presently consist of a store of software, both commercial and DIY, either free or on credit; information on a range of topics available as screens of text; blank screens on which you can leave messages for others; and private messaging. The system is a commercial one, that is, it is set up to make money and many of the services must be paid for. You are allocated a £20 credit limit when you register as a user, but the service could cost you many times this amount if you are not careful. Commodore has however tried to ease the many costs and budgets by setting up a number of alternative services with different charge rates. Commercial

software can be bought and immediately transferred to your own machine, although you may need to leave the Compunet modem attached to your machine in order to run the software once you have bought it. A service called The Jungle is a relatively low-cost service which can, to a limited degree, provide a bulletin board with messages and answers on any topic. There are educational services, and so on.

"The structure of Compunet is based on pages of text..."

The hardware for the 64 hardware for other users to follow) consists of a black box which plugs into the cartridge port and has a five cable ending in a series 600 telephone plug, so you must have one of the new-style phone sockets to use the modem.

If you want to use the modem for talking to another 64 then you will need a double socket or a special converter so that you can use your ordinary phone at the same time. Inside the modem are two circuit boards, one to control the phone signals and to provide the auto-dial hardware, and the other holds the built-in 8008 and hardware to communicate with the 64. In principle, it should be possible to use the modem as a general-purpose device, to talk to existing phone-in services. Additional software is required for this and you will be restricted to 1200 baud service.

The structure of Compunet is based on the idea of pages of text (called frames), much the same as those provided by Teloson. The frames are numbered and are used as directories to further information

on in the other Compunet facilities. For example, Frame 1 gives you the main menu. It tells you that Frame 100 will tell you more about Compunet, 200 is for micro and software, 300 is the shopping centre, 400 is money matters, and so on. If you select Frame 100 then you are shown a further directory, Frame 110 for information on how to register on Compunet, 120 is a user guide, 140 information on the Compunet Courier service (sending messages) — you get the idea. Each directory gives you more information on a given topic and you reach a specialised frame which offers the final product. The final product may be a document of several frames which is transferred to your machine and held in memory; you can look at each frame as you wish and save the whole document to tape or disk for looking at later. Most of the help and guide information is available in this manner. Some of these documents may be only available at a price, in order to receive them you must be properly registered and must agree the price before seeing what it is that you are purchasing.

Commercial

There are several forms of software available. Commercial software from Commodore and other software houses can be bought at special rates and home-grown software can be bought and sold. Again, you don't know what you are getting until you have paid for it. Compunet is trying to ensure that the software sold gives value for money by threatening to excommunicate anyone caught abusing the service, and by giving buyers a chance to vote on the software which has just been bought. These votes are added and displayed for all to see — high votes should mean that the software

has proved popular with previous buyers. You can only vote if you buy the software and you have only one vote per software item. The problem here is that, at present, Compuser does not tell you how many people in total have bought the software. Thus you can not know what proportion of buyers have been pleased with their purchase. Perhaps the system will be changed though. Compuser is asking for suggestions for additional services and improvements in their existing.

Software is available under several headings, including educational and business software. Compuser is keen to build up both these potential links and is attempting to set up additional services to support such things as business-information services, main-frame facilities, and software for use in schools and beyond.

MUD

Another form of software available on Compuser, and this may become one people's main reason for getting the thing, is software which loads and runs immediately. There are two examples of how this works. When you first log in some software is automatically loaded into your machine to make sure that you can make full use of all the latest facilities. Then, there should be little chance of your hardware getting out of date. The second example is a program called MUD (Multi-User Dungeons), developed at the University of Essex. This is a sophisticated adventure-type program which takes the whole thing a

stage further by allowing up to 32 people to access the thing at the same time. Not only do you have the opportunity to roam around a virtual land, finding treasure, fighting beasts, flailing swords about the place, but you also stand a good chance of meeting another player.

All this happens while you are still connected through Compuser.

Other services provided by Compuser include public and private message sending, and classified advertising. The private message sending is achieved by letting you leave a message, in the form of your own home-made frames, with a named recipient. Only the person that you have named can read the message, just like sending a message through the post. Compuser even calls the process of naming the recipient (so be sure that one if you want "crossing an envelope"). Public messages can be left in a number of ways. If you have some comment to make or a problem you can set up a message and leave it for all to see. If you come back to the system some time later perhaps someone else will have read your message and replied. A special reduced speed messaging service lets you make personal adverts — you name the kind of thing, "Bicycle wanted in exchange for disk drive".

So, all in all, how does the service shape up and how much does it cost? Currently there is a strong commercial influence, which hopefully will become less noticeable as more users start to make their own contributions through bulletin and so on. Compuser has allowed for many types of

user, with many types of requirements. After the first couple of sessions most users will probably find the sections which most interest them and stick to these. There are opportunities to request changes to, or additions to, facilities provided so a station should grow. One aspect which I personally do not like at all is the way that everything has been given a humorous name. The open area is called The Jungle. There is a sort of horizontal menu at the bottom of the screen which allows you to select your station (this is known as a Dashboard — it took me about four hours to work out what a Dashboard was. This particular type of commercial treatment does not help in getting to understand the system.

Complex

As regards costs, "complex" is the word which springs to mind. Most things and something software is simple in that the price is displayed before you buy. Connections charges vary with time of day, are charged at night, £7.00 per hour during the day (plus £2.50 per hour any time if you want 1200/1200 lines). Charges for leaving messages or programs are typically 3p per frame (or per 1K program per day. Programs or message sales cost 40 to 50 per cent of the asking price. So try and work that lot out if you can — my only advice is to think before you commit yourself. It may become a good system, but Commodore intends to make money out of it, and we all know the level of recovery the company is used to. □

FAST LOADERS

COMMODORE 64

TAPE TO DISK



R.B.S.

A NEW GENERATION conversion utility, developed from the acclaimed Hypersave-64, R.B.S. converts virtually all your fast loading cassette programs to TURBO-LOAD, faster than the C64 disk drive. Multi-part and autoreg programs are handled with ease. Converted programs load independently. No additional hardware, no jokers, no BYE calls, no user knowledge required. Load "The Hobbit" in 120 seconds. Tomado, Lightning load, Fastback now obsolete. R.B.S. will convert more programs than any competing utility. Cassette £7.95p.

HYPERSAVE-64

Retaining the flexibility which the programmer demands, Hypersave leaves you in control. If additional Basic commands: Save, load, verify split 64K continuous Ramal HYPERSPED with full error checking. Converted programs reload independently. Autoran facility. Hypersave also allows a small number of fast loading programs to be converted to Hyperload. Reviewed in Your 64 issue 2. Cassette £7.95p.

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DISKUS 1

Introducing the new market leader. This is the simplest to use and most efficient tape to disk transfer utility yet devised. No program rewriting is required and transferred programs will automatically run when loaded.

- For single, multi, and autoreg programs
- Automatic filename handling
- Efficient use of Disk space
- No user knowledge required

Diskus 1 will handle several program types which other utilities ignore, including headerless files. A bonus program is included which will transfer a number of fast loading programs to disk. Cassette £7.95p.

PRO-SPRITE

Library, Editor, Animator for single and multicolour sprites. Joystick control. Packed with features. Menu driven. 100% machine code. Complete with your first sprite library. Cassette £7.95p.

Finding a new home for your machine code

Useful routines for relocating machine code will ease the transition from Basic. M C Hart explains

AFTER PROGRAMMERS have made the transition to machine-code, one question when planning a program is 'Where shall I locate the code?' One favoured location is the cassette buffer (locations 828-833 on the C-64 and VIC) while another on the C-64 is the area from location 1C000-1CFFF (48K12-43247 decimal). Sometimes, though, you may need to have two machine code routines in memory at

the same time and if they were both written to occupy the same space then one of them will need to be relocated.

If the program consists entirely of relative branches such as BRQ +31 or of absolute jumps, then no problems will occur. Other types of code do not relocate so easily, however. If you have written some code which contains references to sub-routines within itself, then these sub-

routine calls will not transfer over without amendment as they refer to absolute addresses in RAM. In such cases, it would be useful to have a routine which computes the new routine location before the data is POKE'd into position. This is called a RELOCATING LEADER and one is presented here which is suitable for any C64 machine.

The principle behind a relocating leader

HEXIT listing

```

1 FOR J=828T0931:REDOX=POKEJ,X:NEXT
2 END
10 DATA 32,115,0,201,36,200,42,32
11 DATA 82,3,72,32,82,3,170,104
12 :DATA 32,205,189,76,116,164,32,97
13 :REM VIC 32,205,221,76,116,196,32,97
14 :REM B2 32,217,220,76,137,195,32,97
15 :REM B4 32,131,207,76,255,179,32,97
16 :
17 DATA 3,10,10,10,10,133,35,32
18 DATA 97,3,101,35,96,32,115,0
19 DATA 201,58,41,15,144,2,105,6
20 :DATA 96,32,130,173,32,247,103,170
21 :REM VIC 96,32,130,205,32,247,215,170
22 :REM B2 96,32,139,204,32,210,214,170
23 :REM B4 96,32,132,109,32,45,201,170
24 :
25 DATA 152,72,72,130,72,72,169,36
26 DATA 32,210,235,104,32,144,3,104
27 DATA 32,149,3,104,32,144,3,104
28 DATA 32,149,3,95,24,106,106,106
29 DATA 106,41,15,24,105,40,201,50
30 DATA 144,2,105,6,32,210,235,96
31 :
32 REM FOR PETS (B2 & B4) MAKE 115 IN
33 REM LINES 10,10 INTO 112
34 :

```

is essentially quite simple. If we know that the location of a sub-routine is 20 bytes on from the start of the program, then the location of the subroutine should remain 20 bytes on from the start of the program whenever it happens to be located. All that we have to do is to identify the relevant subroutine calls, substitute some code which contains the offset from the start of memory and then compute and POKE in the new low and high addresses of the sub-routine.

The routine HEXIT provides a hexadecimal calculator, so the demonstration routine is actually useful. To see it, use merely type:

SVS Location, J---

or

SVS Location,---

If the first character is a \pm sign then the number will be converted to decimal. If there is no \pm sign then the number is assumed to be decimal and will be converted to its hexadecimal equivalent. This is a bonus, for the real purpose of the article is really to demonstrate how relocating loaders actually work. If you like, you can use a slightly different system — making the variable DEC loc START+J and the variable HEX loc START+40, one can then say SVS(DEC)— or SVS(HEX)—. Note the absence of a comma in this case.

Relocate

If you study the disassembly of HEXIT, then you will notice that the eight pairs of bytes that are underlined are references to sub-routines contained within the body of the code. These are actually low sub-routines each of which is called twice. The first routine is BASIC end, coming from rom, this is located 22 bytes from the start of the program.

Similarly, sub-routine ROM1 is located 37 bytes from the start, sub-routine ROM2, 84 bytes from the start and sub-routine ROM3, 89 bytes from the start.

Once we have computed (manually!) the offset from the start of the program, then everytime reference is made to a sub-routine that we desire to relocate we replace the low byte of the sub-routine call with the offset expressed as a NEGATIVE number. For example, if you study the HEXIT + RELOCATE BASIC loader, then you will see that if the first sub-routine call comes right at the beginning of the second line. Therefore we replace the low byte of (decimal) 81 with +12 and repeat the same procedure whenever necessary throughout the program.

When the relocating loader HEXIT + RELOCATE is actually run, then the bytes of the sub-routine calls that we need to recompute are indicated by being negative numbers. Notice that the variable S holds the new start location of the code and any positive integer is POKED straight into memory. If a negative number is indicated then first S is subtracted. This ADDS the offset onto the new start location (S minus a negative number equals S plus that number!) Y is the low byte of the new sub-routine call and this is POKED in after computation. The high byte is computed and the data pointer moved on

HEXIT + Relocate listing

```

1 G=49152:H=184
2 FOR J=8 TO 8+H-1:READ X:IF X=8THEN 4
3 X=8-X:Y=X-INT(X/256)*256:POKE J,Y:X=X/256:
  J=J+1:READ Z
4 POKE J,X:HEXT
10 DATA 32,115,8,201,36,208,42,32
11 DATA -22,3,72,32,-22,3,178,184
12 DATA 32,295,189,76,116,164,32,-37
13 DATA 3,18,18,18,18,133,35,32
14 DATA -37,3,181,35,96,32,115,8
15 DATA 281,58,41,15,144,2,185,8
16 DATA 96,32,138,173,32,247,183,178
17 DATA 182,72,72,138,72,72,169,96
18 DATA 32,218,255,184,32,-84,3,184
19 DATA 32,-89,3,184,32,-84,3,184
20 DATA 32,-89,3,96,24,106,185,185
21 DATA 186,41,15,24,185,48,281,58
22 DATA 144,2,185,6,32,218,255,96

```

Turn to page 66 for the HEXIT disassembly.

by a READ Z and the loop variable incremented by $J = J + 1$. The high byte is then POKED in by the normal operation of line 4. Notice that although only one value is inserted into the code, (i.e. the negative value of the offset) two new values are generated from this, the low and high bytes of the computed sub-routine location.

Obviously, in this approach one has to have a variable holding the value of the start (S in this case) and it is probably convenient to have a value specifying the total number of bytes in the program (H). In order to relocate the code, all that is needed is to put the desired location for the start of the code into the variable S in line 1.

A relocating loader like the one just described makes one's routines much more versatile. Just remember that one has to start counting the bytes from 8 at the start of the program, and all of your programs should relocate without difficulty.

The HEXIT loader is set up, by default, for a Commodore 64. As there are calls into ROM, the routine will need adapting for other machines. This is quite easy to do. In place of line 12 (tagged by the double colon ::) put the relevant line for the VIC, PET BASIC 2 or PET BASIC 4. Do likewise for line 20.

In addition, PET owners (80 and 84) should ensure that the value of 153 in line 18,19 reads 112. ■

HEXIT disassembly

0300 00 70 00	JSR #0070	
0301 00 04	CMF #004	
0301 00 04	BNE #0300	
0303 00 00 03	JSR #0300	: Replace with low/high
0304 00	PLA	bytes of (START + 03)
0307 00 00 03	JSR #0300	: Replace with low/high
030A 00	TWA	bytes of (START + 03)
030B 00	PLA	
030C 00 00 00	JSR #0000	
030E 00 74 04	JMP #0474	
030E 00 00 03	JSR #0300	: Replace with low/high
030E 00	RSL	bytes of (START + 03)
030E 00	RSL	
030F 00	RSL	
030F 00	RSL	
030F 00	RSL	
030F 00 03	STW #03	
030F 00 01 03	JSR #0300	: Replace with low/high
030E 00 03	ADC #03	bytes of (START + 03)
030E 00	RTS	
030E 00 70 00	JSR #0070	
030F 00 00	CMF #000	
030E 00 0F	RND #00F	
030E 00 00	BCC #030C	
030A 00 00	ADC #000	
030C 00	RTS	
030D 00 0A 00	JSR #000A	
030E 00 07 07	JSR #0707	
030E 00	TWA	
030E 00	TYA	
030E 00	PIA	
030E 00	PIA	
030E 00	PIA	
030E 00	PIA	
030E 00 04	LDA #004	
030E 00 00 0F	JSR #0F00	
030F 00	PLA	
030E 00 00 03	JSR #0300	: Replace with low/high
030E 00	PLA	bytes of (START + 04)
030A 00 00 03	JSR #0300	: Replace with low/high
0307 00	PLA	bytes of (START + 00)
030E 00 00 03	JSR #0300	: Replace with low/high
030E 00	PLA	bytes of (START + 04)
030C 00 00 03	JSR #0300	: Replace with low/high
030E 00	RTS	bytes of (START + 00)
030E 00	CLC	
030E 00	ROK	
030E 00	ROK	
030E 00	ROK	
030E 00	ROK	
030E 00 0F	RND #00F	
0307 00	CLC	
030E 00 00	ADC #000	
030A 00 0A	CMF #00A	
030C 00 00	BCC #030C	
030E 00 00	ADC #000	
030E 00 00 0F	JSR #0F00	
030E 00	RTS	

COMMODORE SOFTWARE FILE

Disassembler

Mark Thomson, from *Softlink* reveals this program for the 64 or PC.

THIS IS A simple disassembler for the Vic or 64. It will disassemble any section of memory and list it in standard 6002 mnemonic form. The working loop of the program, lines 140 to 120, has been kept as short as possible, so there is no error handling.

The start address specified for disassembling must always contain a valid

mnemonic op-code, never an address or an operand, as you will get 'out of data error in 130'. The listing can be sent to screen or printer.

On running, you will be prompted for a filename. This is optional. Second, select the desired output device number. Third, type H or D for hex or decimal mode. Finally, enter start and end addresses of the routine to be disassembled (4-bb hex or decimal according to mode).

The program works by first peaking the address in 'A' then searching the data queue for the op-code of the same value. The memory location address is then

converted into hex if necessary and displayed, along with the mnemonic read into the data queue into M5. The third value read from the data queue is N, which denotes addressing mode. This value points into the appropriate subroutines which calculate the operand and address and return it in OP5 which is then printed.

The address counter then has N added to it to point the next op-code.

Use the disassembler to study the 8084 subroutines in your machine — for example for keywords such as LOAD. The Programmer's Reference Guide contains a comprehensive memory map.

```

1 REM*****
2 REM*****
3 REM*****DISASSEMBLER*****
4 REM***** BY *****
5 REM***** MARK THOMSON *****
6 REM*****
7 REM*****
10 INPUT [CLR] [SYS]FILENAME [OFF]";FS
20 INPUT [DOWN] [SYS]OUTPUT DEVICE NO.[OFF]";D
30 FS=FS+CHR$(13)+CHR$(10)+CHR$(10)
40 OPEN S,D,S,FS
50 INPUT [DOWN] [SYS]SELECT HEX OR DECIMAL(H OR D)[OFF]";ES
60 IFS<>"H"AND<>"D"THEN 50
70 IFS="H"THENMODE=0
80 IFS="D"THENMODE=1
90 INPUT [DOWN] [SYS]START ADDRESS[OFF]";EA$
100 INPUT [DOWN] [SYS]END ADDRESS[OFF]";EA$
110 ONMODE+1GOSUB20070,20080
120 IFA>=EATHENPRINT [DOWN]ADDRESS ERROR";FORDE=OTOS040;NEXT GOTO90
130 PRINT [CLR]";A=A$
140 F=PEEK(A)
150 READC,M$,N:IFC<>FTHEN150
160 RESTORE:ONMODE+1GOSUB20020,20030;REM HEX,DEC ADDRESS DECODE
170 PRINT#5,A$,M$," ";:IFMODE=0ANDN<>1THENPRINT#5,"$";:REM $ SHOWS
HEX OR
180 ONGOSUB20040,20050,20060;REM CALCULATE OPERAND
190 PRINT#5,OP$
200 A=A+N;REM BUMP ADDRESS COUNTER TO NEXT MNEMONIC
210 IFA>=EATHENPRINT#5;CLOSE5;END
220 GOTO140
20000 REM HEX-DEC S/R PASS HD$,GET ED
20001 HD=16*(ASC(HD$)-48+(ASC(HD$)>44)*7)+(HD$=RIGHT$(HD$,1)
20002 HD=HD+ASC(HD$)-48+(ASC(HD$)>64)*7
20003 RETURN
20010 REM DEC-HEX S/R PASS DH$,GET DH$
20011 DH=CHR$(INT(DH/16)-[INT(DH/16)>9]*7+48):DH=DH-INT(DH/16)*16
20012 DH=DH+CHR$(DH-(DH>9)*7+48)
20013 RETURN

```

```

20020 REM ADDRESS DECODE (HEX) S/W
20021 DN=INT(A/256):GOSUB20010:REM CONVERT HIGH BYTE
20022 AS=DN:DN=A-INT(A/256)*256:GOSUB20010:REM CONVERT LOW BYTE
20023 AS=A+DN:RETURN
20030 REM ADDRESS DECODE (DEC) S/W
20031 AS=RIGHT(STR$(A),LEN(STR$(A))-1):RETURN
20040 REM INFLD ADDRESSING (NO FORWARD) S/W
20041 OF="":RETURN
20050 REM 1-BYTE OPERAND S/W
20051 IPRD=I-TRND(OF-LEFTS(STR$(PRD(A+1)),LEN(STR$(PRD(A+1)))-1):RETURN
20052 DN=PRD(A+1):GOSUB20010:OF=DN:RETURN
20060 REM 3-BYTE OPERAND S/W
20061 IPRD=I-TRND(OF=PRD(A+1)*256+PRD(A+1)+OF=RIGHTS(STR$(T),LEN(STR$(T))-1):RETURN
20062 DN=PRD(A+1):GOSUB20010:OF=DN:DN=PRD(A+1):GOSUB20010:OF=OF+DN:RETURN
20070 REM CALCULATE PROGRAM START AND END ADDRESSES (HEX) S/W
20071 SD=LEFT$(SAS,2):GOSUB20080:SA=SD*16
20072 SD=RIGHT$(SAS,2):GOSUB20080:SA=SD*16
20073 SD=LEFT$(SAS,2):GOSUB20080:SA=SD*16
20074 SD=RIGHT$(SAS,2):GOSUB20080:SA=SD*16:RETURN
20080 REM CALCULATE PROGRAM START AND END ADDRESSES (DEC) S/W
20081 SA=VAL(STR$(SAS)):RETURN
20090 DATA 0,ERR,1,1,ORA(1:R),2,5,ORA,2,6,ASL,2,8,PRP,1,9,ORA,2,10,ASL,2
20091 DATA 13,ORA,3,14,ASL,1,15,BPL,2,17,ORA(1:Y),2,21,ORA(8:2,22,ASL,X,2
20092 DATA 24,CLC,1,25,ORA,3,26,ORA,3,30,ASL,3,32,SR,3,33,AND(1:X),2
20093 DATA 36,BIT,2,37,AND,2,38,ORX,2,40,PLP,1,41,AND,2,42,SOLA,1,44,BIT,3
20094 DATA 45,AND,3,46,ORL,3,48,BMI,2,49,AND(1:Y),2,51,AND,2,54,SOLA,1,54,BIT,2
20095 DATA 56,AND,1,57,AND,3,58,CLD,1,61,AND,3,62,SOLA,3,64,BIT,1
20096 DATA 65,BOR(1:R),2,66,BOR,2,70,ERR,2,72,ERR,2,73,SOLA,3,74,ERR,3
20097 DATA 76,MP,3,77,ERR,3,78,ERR,1,80,ERR,2,81,ERR(1:Y),2,83,ERR,X,2
20098 DATA 85,ERR,2,86,CLD,1,87,ERR,3,91,ERR,3,94,ERR,3,96,ERR,1
20099 DATA 97,AND(1:R),2,101,AND,2,102,ERR,2,104,PLA,1,105,AND,2,106,ERR,1
20100 DATA 108,MP(1:Y),3,109,AND,3,110,ERR,3,112,ERR,2,113,AND(1:Y),2
20101 DATA 117,AND(X:2),118,ERR,X,2,120,ERR,1,121,AND,3,125,AND,3,126,ERR,3
20102 DATA 128,STA(1:R),2,130,ERR,2,133,STA,2,134,ERR,2,136,ERR,1,138,ERR,3
20103 DATA 140,ERR,3,141,STA,3,142,STA,3,144,ERR,2,145,STA(1:Y),2,146,ERR,X,2
20104 DATA 149,STA(X:2),150,ERR,X,2,152,ERR,1,153,ERR,3,154,ERR,1,157,ERR,3
20105 DATA 160,ERR,3,161,ERR(1:R),2,162,ERR,2,164,ERR,2,166,ERR,2
20106 DATA 168,ERR,2,169,ERR,1,170,ERR,2,172,ERR,3,173,ERR,3
20107 DATA 174,ERR,3,175,ERR,2,177,ERR(1:Y),3,180,ERR(X:2),181,ERR(X:2
20108 DATA 182,ERR(1:2),184,ERR,1,185,ERR,3,186,ERR,1,188,ERR,3,189,ERR,3
20109 DATA 190,ERR,3,192,ERR,3,193,ERR(1:R),2,194,ERR,2,197,ERR,3
20110 DATA 199,ERR,3,200,ERR,1,201,ERR,2,202,ERR,3,204,ERR,3,205,ERR,3
20111 DATA 206,ERR,3,208,ERR,2,209,ERR(1:Y),2,211,ERR(X:2),214,ERR(X:2
20112 DATA 216,ERR,1,217,ERR,3,221,ERR,3,222,ERR,3,224,ERR,2,225,ERR(1:R),2
20113 DATA 228,ERR,2,229,ERR,2,230,ERR,2,232,ERR,3,233,ERR,3,234,ERR,1
20114 DATA 236,ERR,3,237,ERR,3,238,ERR,3,240,ERR,3,247,ERR(1:Y),2,249,ERR(X:2
20115 DATA 246,ERR(X:2),248,ERR,2,249,ERR,3,251,ERR,3,254,ERR,1

```

Sprightly

Save Brown from Langley Hall needs the aid of program

THIS IS A sprite demonstration incorporating animation and joystick control.

You'll see a little man on the screen who will walk around under the control of a joystick. Line 20-40 check the edge of the screen for the sprite and sets the correct registers and positions. 70-140 handles movement and sprite selection. 150-200 checks the joystick; 210 POKEs the X and Y values to position the sprite. Line 250

clears the screen, and 260 sets up arrays and variables for sprite images. Lines 270-280 set up the sprite registers. 280 prints a message. 300-350 read sprite image data into memory. 320 reads in image color and puts values in arrays. 330 positions the initial sprite. 400-470 contain sprite image data, and 480-600 give the image order.

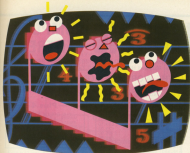
1 REM WRITTEN BY STEVE BROWN
10 GOTO250

20 IFY=255THENY=255:RETURN:REM CHECK TOP SCREEN

30 IFX=255THENX=0:RETURN:REM CHECK BOTTOM SCREEN

40 IFX=0ANDRND(PEEKCV+16)=1THENPOKEY=16:G=0:REM RETURN:REM CHECK RIGHT

50 IFX=0ANDRND(PEEKCV+16)=0THENPOKEY=16:J=0:REM CHECK LEFT



notes all at the same time!

■ At the press of a button, you can summon up pre-programmed rhythms and bass accompaniments to play along to.

■ These three rhythm combinations can be speeded up or slowed down.

■ You can even glissando (so long as you don't hurt yourself.)

■ That is, make a note slide up in pitch.

■ You can filter sound: reduce the treble, the bass, or both. You can save, on cassette or disk, a voice or tune for future use.

■ And, for better sound reproduction, you can connect

MAKE MUSIC YOUR FORTE.

■ Alright, let's all gather round the computer for a good old sing-song.

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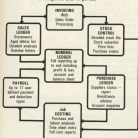
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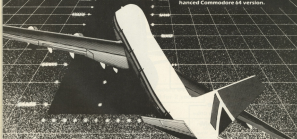
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```

688 DATA 126.0,0.0,102.0,0.0,66.0,0.0,90.0,0.0,126.0,0.0,24.0,0.0,126.0
689 DATA 126.0,0.0,126.0,0.0,126.0,0.0,60.0,0.0,60.0,0.0,36.0,0.0,36.0
690 DATA 4.0,0.0,4.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0
691 REM IMAGE 1
700 DATA 126.0,1.254,0.0,0.94,0.0,134,0.0,102,0.0,24,0.0,60,0
701 DATA 124.0,0.0,190,0.1,61,0.0,2,60,120,0.00,0.0,102,0.0,195,0
702 DATA 129,120,7.0,120,0.0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
703 REM IMAGE 2
720 DATA 126.0,1.254,0.0,0.94,0.0,134,0.0,102,0.0,24,0.0,60,0
721 DATA 60,0,0,60,0,0,124,0,0,190,0,1,61,0,0,60,0,0,102,0,0,195,0
722 DATA 195,0,1,199,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
723 REM IMAGE 3
740 DATA 126.0,1.254,0.0,0.94,0.0,134,0.0,102,0.0,24,0.0,60,0
741 DATA 60,0,0,60,0,0,124,0,0,190,0,0,60,0,0,24,0,0,60,0
742 DATA 60,0,0,124,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
743 REM IMAGE 4
760 DATA 126.0,1.254,0.0,0.94,0.0,134,0.0,102,0.0,24,0.0,60,0
761 DATA 60,0,0,60,0,0,60,0,0,60,0,0,60,0,0,24,0,0,24,0
762 DATA 24,0,0,56,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
763 REM RIGHT IMAGE 1
800 DATA 126.0,0.0,127,120,0,122,0,0,97,0,0,102,0,0,24,0,0,60,0
801 DATA 62,0,0,125,0,0,100,120,1,60,64,0,60,0,0,102,0,0,195,0
802 DATA 129,120,1,192,224,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
803 REM IMAGE 2
820 DATA 126.0,0.0,127,120,0,122,0,0,97,0,0,102,0,0,24,0,0,60,0
821 DATA 60,0,0,62,0,0,125,0,0,100,120,0,60,0,0,102,0,0,99,0
822 DATA 195,0,0,227,120,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
823 REM IMAGE 3
840 DATA 126.0,0.0,127,120,0,122,0,0,97,0,0,102,0,0,24,0,0,60,0
841 DATA 60,0,0,60,0,0,62,0,0,125,0,0,60,0,0,24,0,0,60,0
842 DATA 60,0,0,62,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
843 REM IMAGE 4
860 DATA 126.0,0.0,127,120,0,122,0,0,97,0,0,102,0,0,24,0,0,60,0
861 DATA 60,0,0,60,0,0,60,0,0,60,0,0,60,0,0,24,0,0,24,0
862 DATA 24,0,0,28,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
863 REM IMAGE ORDER
870 DATA 3,4,3,2,1,0,1,2,7,0,9,0,7,6,5,6,7,13,12,11,10,11,12,13
880 DATA 17,16,15,14,13,16,17

```

Breakthrough

of *Atmos* Breakers (70)
BREAKTHROUGH is a version of the old *Favourite Breakers* for the unexpanded Vis. In this version you get an extra life, one hundred points, and a faster

ball every time you break through the wall. The higher the breaks, the more points you score. You start with seven lives, and if you beat the high score you bear a name and you can input your name.

This file game comes from James Stoppa

```

0 POKE36665,175:POKE36679,14:PRINT"*****BREAK THROUGH*****"
1 PRINT"*****BY J. STOPPA*****"
2 PRINT"*****"
3 PORT=59:GOSUBSTEP-1:POKE36665,T:NEXT
4 IFPEEK(137)=64THEN4
5 POKE649,8:POKE649,1
6 PRINT"INSTRUCTION(S)KEY":INPUTA:IFRND(ABS(1.1))=1THENGOSUB2000:G=1
7 PRINTCHR(0):Y=0:L=7:J=36675:Q=7500:J=22:R=40
8 POKE650,120:POKE649,1:PRINT"J":R=CHR(67):POKE36670,15
9 FORN=1TO6
10 PRINTRIS(ABS,R,1)
11 R=1:Y=11:Y=20:ABS(32):C=W:DWY
12 R=INT(RND(1)*8)+1
13 GOTO14
14 P=0+(J*Y)+X:POKEJ+(R*8)+C,32
15 IFPEEK(P)=64THEN200
16 POKEP,81:C=W:DWY

```



```

90 G=PEEK(197)-IFG=64THEN143
100 Z=A-IFG=23THENA=A-1:IFR=3142THENR=R+142
110 IFG=38THENR=R+1:IFR=8162THENR=R+162
140 POKEX,32:POKEY=1+32:POKER,100:POKEH,1,100:GOTO145
143 FORT=1TOX:NEXT
145 IFG>3THENY=Y+1:GOTO164
147 Y=Y-1
150 IFR=1THENR=R-1:IFR=8THENR=3:GOTO170
160 IFR=3THENR=R+1:IFR=21THENR=6
163 GOTO170
164 IFR=4THENR=R-1:IFR=9THENR=3:R=R-3
165 IFR=6THENR=R+1:IFR=21THENR=4
170 IFY>1THENY=300
180 GOTO170
200 IFY<8THEN1000
201 GOTO205
202 IFX<20THENR=R+21:R=4:GOTO4000
203 IFX<1THENR=R-8:R=6:GOTO4000
204 IFPEEK(CP)=100THENPOKEI,135:FORRT=1TO100:NEXT R=R+INT(RND()*#0+1)
205 IFPEEK(CP)=100THENPOKEI,0:GOTO140
250 POKEI+1,135:FORRT=1TO100:NEXT R=R+INT(RND()*#0+4):POKEI+1,0
255 POKEX,32
310 GOTO140
320 REM ** EXPLOSION
333 L=L-1:POKEP=255TO135STEP-1:POKEI+2,F:NEXT:POKEI+2,0:POKER,32:POKEH+1,32
335 IFL<8THENPOKEH+1,RD>#C,32:GOTO300
336 PRINT"#####";FORT=1TO9:READR-PRINTR-:FORP=1TO200:NEXTP:NEXTT
337 PRINT"#####HIT A KEY"
338 IFPEEK(197)<64THEN330
339 IFPEEK(197)=64THEN330
340 PRINT"Z=00 SCORED:V*POINTS":IFV<8THENPRINT"88 A NEW HIGH SCORE █-GOSH
80000
345 RESTORE:PRINT"HIGH SCOREM:PRINTS.H# INPUT"ANOTHERGO?G#(FRIDN(G#),1,1)=
"Y"THEN6
347 END
350 REM ** POINTS
355 IFY=8THENY=Y+30
360 IFY=1THENY=Y+25
370 IFY=2THENY=Y+20
380 IFY=3THENY=Y+15
390 IFY=4THENY=Y+10
400 IFY=5THENY=Y+5
410 GOTO202
1000 REM**BREAKTHROUGH
1005 FORT=135TO255:POKEI+1,T:NEXT:FORT=255TO125STEP-1:POKEI+1,T:NEXT:Y=Y+100:L=L
+1
1010 PRINT"BREAK THROUGH!!!! ONE EXTRA LIFE!!! 100 EXTRA POINTS! █
8555
"Y"
1020 IFPEEK(197)<61THEN1020
1030 K=K-20:GOTO1010
2000 REM**INSTRUCTIONS
2005 PRINT"█ BREAK THROUGH"
2010 PRINT"MIN THIS GAME YOU HAVE TO BREAK THROUGH A BRICK WALL."
2020 PRINT"POINTS ARE AWARDED AS FOLLOWS:--
2030 PRINT"███ █-50":PRINT"███ █-25":PRINT"███ █-20":PRINT"███ █
█-15"
2040 PRINT"███ █-10":PRINT"███ █-5":PRINT"MIT A KEY"
2050 GETA:IFR=""THEN2050
2060 PRINT"YOU CONTROL A PADDLE AT THE BOTTOM OF THE SCREEN."
2070 PRINT"ITS CONTROLS ARE:~:PRINT"←-LEFT,~:PRINT"→-RIGHT."
2071 PRINT"YOU START WITH SEVEN LIVES.#####HIT A KEY"
2072 GETA:IFR=""THEN2072
2075 PRINT"TO BREAK THROUGH THE WALL YOU HAVE TO:~"
2080 PRINT"█, KNOCK A HOLE RIGHT THROUGH IT."
2090 PRINT"█, HIT THE BALL IN THE GAP."
2100 PRINT"THE BALL WILL REBOUND OFF THE WALL AND YOUR PADDLE AT RANDOM AN
GLE."
2120 PRINT"IF YOU BREAK THROUGH YOU WILL GET AN EXTRA LIFE AND 100 POINTS."

```

```

2210 PRINT"WHIT A KEY TO START"
2220 GET#A:IF#A="" THEN2230
2230 GOTO#
2240 DEL: ** HI-SCORE
2250 FOR#=[TO:RER]B:POKE#1,0:FOR#C=FOR#1:GOTO: NEXT#
2260 PRINT"PLEASE ENTER YOUR NAME" :IN#F#H#S#V:RETURN
2270 DATA A,B,C,E " ",O,Y,E,R
2280 DATA 195,400,175,200,195,200,207,200,215,500,0,0
2290 IF#E#C#P#>100 THEN#POKE1,135:FOR#1=1 TO100: NEXT# :POKE1,0
2300 IF#E#C#P#>10000 THEN#>11230#>0
2310 IF#E#C#P#>100000 THEN#>0#>1
2320 IF#E#C#P#>1000000 THEN#>0#>0
2330 POKE1+1,135:FOR#1=1 TO100: NEXT# :POKE1+1,0 :POKE#7,32:GOTO#100

```

Space Mines

unpublished for 30
 LAST MONTH we published the first
 version of this program, which gave the
 instructions and set up the screen.
 Here is the conclusion of Space Mines.

You guide your ship to a safe landing with
 a joystick, avoiding the mines. On the way
 up you can save them for extra points, and
 deal with the mother ship. Watch out,
 though, for the deadly Black Mine.

Kevin Hughes wrote this program for the

```

5:POKE32,27:POKE56,27:POKE1,192:POKE55,192:CLR:PRINT"3"
6:VZ=60073:V#VZ#0:Y#MY-1:POKEY#1,26:L#5
7:POKEY,15:V#22:U#22:POKE58,135:POKE198,0
8:R#37133#32#37134#R#37137#R#37132:POKE1,0:POKE2,127:GOTO5000
50:POKEY2,0:POKEY4,0:POKEY,15:GOTO20000
60:GOTO4000
80:GOTO4000
100:PRINT"#####"
110:FOR#=#TO17:STEP1#>0#>0:PRINT"#####L#R#E#T"
120:RETURN
500:PRINT"##### BY KEVIN HUGHES"
520:PRINT"##### C > LEFT OR RIGHT"
530:PRINT"##### OR A JOYSTICK"
540:PRINT"##### HIT A KEY TO START"
620:GET#A:IF#A="" THEN630
630:GOTO20000
20000:POKE30000,255:DF1=#THE#1#>0:GOTO5000
20010:IFL#00#L#0 THEN#POKEY2,0:GOTO6100
20020:G#32:O#0:P#4#T#POKEY#1,0:PRINT"#####SCORE" :SC" LIVES" :L"
2010:FOR#=#TO15:PRINT"#####" :NEXT#
2020:PRINT"#####" :R#INT#RND#1#50#>1:PRINT#R#C#:"#E"
2040:PRINT"#####":FOR#=#TO15:T#INT#RND#3#4#17#>1
2050:PRINT#R#C#:"#E" :NEXT#
2060:PRINT"#####":
2080:PRINT:PRINT:PRINT:PRINT:FOR#=#TO12:T#INT#RND#2##10#>1:PRINT#R#C#:"#E" :NEXT#
2130:DF#C>100#R#D#>#THE#1#>1:GOTO20000
2150:DF#C>200#R#D#>#THE#1#>1:GOTO20000
2155:T#INT#RND#3#4#15#>1
2160:PRINT#R#C#:"#E" :D#0:C#0:GOTO6000
30000:R#="" :GET#A:IF#A#"#R#DY#=#2 THEN#30020
30020:DF#R#"#THE#1#>22:U#22:PRINT"##### ABORTING" :SC=SC-10
30030:IF#R#"#THE#1#>1:O#1
30040:IF#R#"#THE#1#>P#1:O#-1
30050:IF#R#"#THE#30020
30060:GOTO20000
30070:GOSUB7000
30100:P#P#Y:POKEY2,200:POKEY2,240
30200:POKE7000#P#U#0,0:D#FEEL#7000#P# :IFD#>#THE#P#>22
30300:POKE7000#P#,3:O#0
30400:POKEY2,200:POKEY2,240:POKEY2,0
30500:IFD#>#THE#L#>1:GOTO62000
31000:IFD#>#THE#SC#>10:1#1#1:POKEY2,220:FOR#=#TO100: NEXT# :POKEY2,0:GOTO5000
31100:DF#C#0 THEN#C#>0
31200:DF#1 THEN#L#>1:GOTO62000
31300:DF#>0#D#>30#D#>#THE#L#>1:GOTO62000
31400:DF#>152 THEN#POKEY2,150:FOR#=#TO100: NEXT# :V#22:U#22:GOTO5000
31500:DF#>#THE#L#>#H# :P#1:GOTO31400
31600:L#="R" :P#>
31700:GOSUB1000:GOTO4000
40000:PRINT"##### BOSS IS IN PLAY"

```

```

4010 PRINT "84"
4020 R=INT( GET$( [FRA=" ", THENP=P-1 ] ) )
4040 IF R=" " THENP=P+1 : G=1
4041 IF R=" " THENH=45
4042 GOT04020
4045 GOSUB7000
4050 P=P-22 : POKEV2,200 : POKEV2,240
4070 POKE 7000+P+22+0,0 : POKE(7000+P) : POKE(7000+P,3) : G=0
4110 IF G=4 THEN SC=SC+10 : POKEV2,170 : PORG=INT(150) : NEXT L : POKEV2,0 : G=22 : GOT04020
4120 IF G=0 OR G=7 THEN POKEV2,220 : PORG=INT(100) : NEXT L : POKEV2,0 : GOT02005
4140 IF G=0 OR G=3 OR G=8 THEN L=L-1 : GOT06200
4150 IF G=1 OR 2 THEN L=L-1 : GOT06200
4155 IF P=0 THEN L=L+1 : P=1 : GOT04150
4157 L=L+1 : P=0
4160 GOSUB1000 : GOT04020
6100 POKE3000,340 : PRINT "***** YOUR SCORE WAS : SC : IF SC=0 THEN H1=50
6111 PRINT "00 HIGH SCORE IS : H1 : PRINT "***** PRESS 'Y' WHEN READY"
6115 GET$( [FRA="Y" THEN H1=20
6120 GOT06115
6130 L=5 : SC=0 : J=0 : PRINT "J" : GOT02000
6200 E=0 : R=0 : D=0 : P=0 : POKEV2,0
6230 D=D-23 : R=R-21 : D=D+21 : P=P+23
6240 POKE 7000+P+0+0,205 : POKE 7000+P+0+0,205
6250 POKE 7000+P+0+0,205 : POKE 7000+P+0+0,205
6250 POKE30410+P+0+0,4 : POKE30410+P+0+0,4 : POKE30410+P+0+0,4 : POKE30410+P+0+0,4
6260 POKEV2,250 : POKEV4,250 : C=C+1 : IF C=3 THEN H2=200
6262 POKE 7000+P+0+0+23,32 : POKE 7000+P+0+0+21,32
6263 POKE 7000+P+0+0-21,32 : POKE 7000+P+0+0-23,32
6270 GOT06230
6280 POKEV2,0 : PORG=15100 : STEP=1 : PORG=240 : GOT0000 : P=2 : POKEV4,5 : POKEV,R : NEXT L : R
6300 U=22 : Y=22 : PRINT "00L HARD LUCK ***** : PORT=INT(1000) : NEXT T : GOT050
7000 POKE10,0 : POKE12,127 : J1=-1 : POKE(10+R+INT(128)*0) : POKE12,255 : R=PEEK(10)
7040 J2=-1 : POKE(12)*0) : R=0
7050 R=0 : POKE(12)*0) : R=0
7060 IF J2=1 THEN P=P-1 : G=1
7070 IF J1=1 THEN P=P+1 : G=1
7075 IF R=1 AND Y=22 THEN
7080 IF P=1 AND Y=22 THEN H1=22 : U=22 : PRINT "00L REPORTING ***** : SC=SC+10
7077 RETURN

```

Maths Test

Alan Proctor from Birmingham sends this program. THIS PROGRAM test you on all four main parts of mathematics and offers five levels of difficulty. It is recommended for use by

youngsters leaving their tables, or just by adults who wish to keep themselves in practice.

```

5 G=0
10 PRINT "J" : POKE 53201,6 : POKE 53200,5
15 PRINT "*****"
20 PRINT "MATHS TEST *****"
30 PRINT "*****"
40 PRINT "*****"
50 PRINT "*****"
55 PRINT "PRESS 127 TO END J.P. PROGRAM"
60 PRINT "***** ADDITION *****"
70 PRINT "***** SUBTRACTION *****"
80 PRINT "***** MULTIPLICATION *****"
90 PRINT "***** DIVISION *****"
100 PRINT "***** PLEASE PICK 1,2,3 OR 4 ***** : INPUT R : GOT0110
105 PRINT "J" : GOT0111
110 PRINT "J" : PRINT "***** LEVEL (1-5) ***** : INPUT B : PRINT "J"
111 IF B=1 AND B=1 THEN 135
112 IF B=1 AND B=2 THEN 136
113 IF B=1 AND B=3 THEN 137
114 IF B=1 AND B=4 THEN 138
115 IF B=1 AND B=5 THEN 139
116 IF B=2 AND B=1 THEN 140

```



```

117 IF A=2 AND B=2 THEN 141
118 IF A=2 AND B=3 THEN 142
119 IF A=2 AND B=4 THEN 143
120 IF A=2 AND B=5 THEN 144
121 IF A=3 AND B=1 THEN 145
122 IF A=3 AND B=2 THEN 146
123 IF A=3 AND B=3 THEN 147
124 IF A=3 AND B=4 THEN 148
125 IF A=3 AND B=5 THEN 149
126 IF A=4 AND B=1 THEN 150
127 IF A=4 AND B=2 THEN 151
128 H=50:IF A=4 AND B=3 THEN 152
129 H=45:IF A=4 AND B=4 THEN 153
130 H=60:IF A=4 AND B=5 THEN 154:END
135 FOR C=1 TO 10:R1=INT(RND*(1#25))+R2=INT(RND*(1#25)):GOTO 160
136 FOR C=1 TO 10:R1=INT(RND*(1#41))+11:R2=INT(RND*(1#41)+11):GOTO 160
137 FOR C=1 TO 10:R1=INT(RND*(1#61))+29:R2=INT(RND*(1#61)+29):GOTO 160
138 FOR C=1 TO 10:R1=INT(RND*(1#151))+59:R2=INT(RND*(1#151)+59):GOTO 160
139 FOR C=1 TO 10:R1=INT(RND*(1#326))+119:R2=INT(RND*(1#326)+119):GOTO 160
140 FOR B=1 TO 10:R1=INT(RND*(1#43))+4:R2=INT(RND*(1#15)+15):GOTO 170
141 FOR B=1 TO 10:R1=INT(RND*(1#46))+24:R2=INT(RND*(1#25)+9):GOTO 170
142 FOR B=1 TO 10:R1=INT(RND*(1#71))+49:R2=INT(RND*(1#41)+19):GOTO 170
143 FOR B=1 TO 10:R1=INT(RND*(1#75))+49:R2=INT(RND*(1#56)+29):GOTO 170
144 FOR B=1 TO 10:R1=INT(RND*(1#151))+89:R2=INT(RND*(1#90))+39):GOTO 170
145 FOR B=1 TO 10:R1=INT(RND*(1#11))+32=INT(RND*(1#11)):GOTO180
146 FOR E=1 TO 10:C1=INT(RND(4#16))+C2=INT(RND(4#16)):GOTO 180
147 FOR E=L TO 10:R1=INT(RND(9#21))+C2=INT(RND(9#21)):GOTO 180
148 FOR E=1 TO 10:C1=INT(RND(1#26)+15)+C2=INT(RND(1#26)+15):GOTO 180
149 FOR E=1 TO 10:C1=INT(RND(1#46)+19)+C2=INT(RND(1#46)+19):GOTO180
150 FOR F=1 TO 10:T=INT(RND(1#6)+1):PRINT (RND(2#15)):GOTO 190
151 FOR F=1 TO 10:T=INT(RND(1#6)+1):PRINT (RND(2#15)):GOTO 190
152 FOR F=1 TO 10:T=INT(RND(1#10)+4):P=INT(RND(2#15)):GOTO190
153 FOR F=1 TO 10:T=INT(RND(1#12)+4):P=INT(RND(2#15)):GOTO190
154 FOR F=1 TO 10:T=INT(RND(1#15)+4):P=INT(RND(2#15)):GOTO 190
155 POKES3281,2:PRINT"#####CORRECT"
156 FORH=1TO1000:NEXTH:POKES3281,6:PRINT"J":GOTO165
160 PRINTH"="H2"=":INPUT X
161 H=H+90
162 IF H>30:GOTO155
163 POKES3281,3:PRINT"#####CORRECT":S=S+1
164 FORH=1TO1000:NEXTH:POKES3281,6
165 PRINT"J"
166 NEXT C:GOTO200
167 POKES3281,2:PRINT"#####CORRECT"
168 FORH=1TO1000:NEXTH:POKES3281,6:PRINT"J":GOTO 175
170 PRINTB1"="B2"=":INPUT X
171 H=B1-B2
172 IFH<0:GOTO167
173 POKES3281,3:PRINT"#####CORRECT":S=S+1
174 FORH=1TO1000:NEXTH:POKES3281,6
175 PRINT"J"
176 NEXTD:GOTO 200
177 POKES3281,2:PRINT"#####CORRECT"
178 FORH=1TO1000:NEXTH:POKES3281,6:PRINT"J":GOTO 185
180 PRINTC1"="C2"=":INPUT X
181 H=C1-C2
182 IF H<0:GOTO177
183 POKES3281,3:PRINT"#####CORRECT":S=S+1
184 FORH=1TO1000:NEXTH:POKES3281,6
185 PRINT"J"
186 NEXTE:GOTO200

```

```

187 POKE3281,2:PRINT"*****CORRECT*"
188 FORN=1TO1000:NEXTN-POKE3281,6:PRINT"J":GOTO195
190 RESTORE:FOR E=0 TO H:READ R:NEXT E
191 FORN=0 TO R:READ R:NEXT N:M=T#R
192 DATA:PRINT"DIVIDE "M/N;" :T:INPUT X:IF BOX THEN 187
193 POKE3281,3:PRINT"*****CORRECT":S=S+1
194 FORN=1TO1000:NEXTN-POKE3281,6
195 PRINT"Z"
196 NEXTF
200 PRINT"Z"
201 PRINTTAB(7)"YOU SCORED "S"OUT OF 10"
202 FOR K=1 TO 2000:NEXT K
203 PRINT"Z"
210 PRINTTAB(5)"DO YOU WANT ANOTHER GO(Y/N)"
215 GET B:IF B="*" THEN 215
220 IF B="Y" GOTO 5
230 IF B="N" THEN 240
235 GOTO 205
240 PRINTTAB(4)"OH! BE LIKE THAT THEN I'M GOING"-FOR
T=1TO2000:NEXTT:SYS64728
250 DATA 1,2,3,4,5,1,2,3,4,5,1,2,3,4,5,3,4,5,6,7,3,4,5,6,7,5,4,6,5,
7,3,4,5,6,7
260 DATA 6,5,6,5,7,6,8,9,5,8,8,9,10,15,17,12,11,8,9,10,8,7,9,13,12,16
270 DATA 14,25,26,24,30,30,40,18,16,19,20,30,40,18
280 DATA 18,25,25,40,19,17,15

```

Notinput

to enter a name from the screen without affecting the surrounding data or graphics.

An array, N%, is dimensioned to store each character. Line 119 prints a screen message and blinks the cursor at a prompt. Control then passes to the main sub-routine at 1000.

An invalid entry will cause a warning. When incorporating the routine in your own programs, change the reference of N% and the iteration values to 100, 100 and 10000 to modify the input length. You might also alter 10000 to accept, say, only numerics, or any other type of input which your program might require.

Paul Bell of Newcastle sends his Commodore 64 program

NOTINPUT is a processed input routine

```

10 REM *****
20 REM * *
30 REM * NOTINPUT *
40 REM * *
50 REM *****
60 DIMN%(22):D=Y#0
100 FORI=0TO21:N%(I)=32:NEXTI
110 PRINT"MENTER NAME: ";POKE204,0:GOSUB10000
120 IFA=130RDY#1THENFORI=0TO21:N%=N#+CHR$(N%(I)):NEXTI:GOTO140
130 PRINT"ABC SPC(12)" "GOTO100
140 PRINT"*****"
150 STOP
10000 FORI=0TO21
10010 GETR#:IFR#=""THEN10010
10020 R=ASC(R#)
10030 IFA<0ANDR<32>ORR>96THEN10000
10040 N%(I)=R
10050 WRTTAB,1,1:PRINTR#:NEXTI:D=Y#1
10060 POKE198,0:WRTTAB,1,1:POKE204,1
10070 RETURN

```

Send us your Commodore programs, including a cassette — and a printout on plain white paper if possible. Each listing must be accompanied by a typewritten introduction describing the program and explaining how it is constructed. We pay \$5.00 for each bug free listing published. We cannot guarantee to return every program submitted, so please keep a copy. If you want us to return your listing you must include a stamped, addressed envelope. If you have any problems with the programs, please write to the appropriate author, Software File, Commodore Magazines, 12-12 Little Newport Street, London WC2R 2LU

THE KEYSTICK is dead — long live the RAT! Cheats' revolutionary infra-red controller relegates conventional joysticks to the museum. Compatible with all joystick-driven software, the RAT — Remote Action Transmitter — comes in two pieces: the handpiece, futuristically styled and powered by a 9V battery, and the slim receiver unit which plugs into the Atari Port 2.

The RAT is touch controllable, with a pressure-sensitive pad replacing the conventional joystick handle. The fire button is also replaced with a pressure-pad, and since there are no moving parts it's virtually impossible for the RAT to wear out.

The RAT's infra-red signals are transmitted from the "nose" and picked up by the receiver unit, and cannot interfere with any other remote-control devices such as TVs and radios.

The RAT costs £29.95, but we have eight to give away in this simple competition. As a bonus the winners will receive a copy of Cheats' new arcade game The Perils of Bean Grange, in which the valiant bear must collect enough food to survive through the winter, then avoid slimes, convicts and quakers in his task in the hilarious cave. Bean Grange costs £8.95 in the shops.

How many spots?

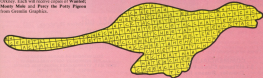
All you have to do to win is to look at the cheats shown below, and tell us how many times you can spot the word CHEATS hidden in it. You can read forwards, backwards or diagonally in a straight line. When you're counted up, put the answer on a POSTCARD with your name and address, and complete this letterhead in an apt, amusing and original manner in 11 words or less. Cheats' RAT sends spots off the competition because . . .

Competition closes on January 31st. Results will be announced in our March issue. Normal competition rules apply. Post your entries to RAT Competition, Commodore Horizons, 12/13 Lady Newport Street, London WC2.

The winners of October's Genesis Graphics competition are: J G Golder of Stafford; C D Turner of Old Windsor; S Adams of York; C Bray of Harwood Heath; G Thomas of Birkenhead; A C Ramsey of Macclesfield; M D-Challier of Soke-on-Thorn; M Breakell of Chesham; N Karimkar of Putney; W Sinclair of Oxford. Each will receive copies of Wanted! Money Made and Precy the Petty Pigeon from Genesis Graphics.

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B	
Bayard	5
BBF	80
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Bubble Star	84
B	
BBS	8, 12, 13
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Chromasonic	70, 71
Chromat	81
Communications	45, 52, 59
Computer	48, 57
Computronics	18
C	
Digital Integration	82
Dr Tech	
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D	
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E	
Elimsoft	4
Logic 3	30-31
M	
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M	
News Generation	26-27
Newssoft	54
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Peakssoft	78
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Clowning around

Book: *Fun Projects for your Commodore*

Author: Dickson and Kahl
Publisher: Prentice-Hall

Price: \$8.75

Reviewer: Celia Whelan

This book is, I suspect, intended to be read by someone considerably younger than years truly. Even so, I think that most people, whatever their age, would find it utterly useless. The introduction suggests that, should we be bored with our 64, buying this volume will once more brighten our dull lives. "You'll be absolutely amazed!" it says "with a Dungeons and Dragons dice rolling program, and you'll probably want to take full advantage of the innovative strategy and music games." I shall be neither amazed nor taking advantage. Practically speaking . . . a metric converter and a computer shopping program truly make your life easier. I can just see all us old owners whodung our pride and joy across the supermarket looking for the best value.

As the book is littered with drawings of a clown (the author perhaps), I can only assume that it is intended for an extremely young audience. It is an American book that should have stayed on the other side of the pond. Were it so cost £1.75, a just might have appealed to somebody, somewhere; but at \$8.75 it is overpriced garbage.

Instant sunshine

Book: *Instant Arcade Games for the Commodore 64*

Author: Jean Frost
Publisher: Pre-PCN

Price: £1.95

Reviewer: Phil Brown

This title might lead you to expect a book of program listings which, strictly speaking, this is not. It is intended for people who are interested in writing their own games programs in Basic, and sets out to teach the inexperienced programmer how this may be done. The aim is to produce either a "Doodles versus the

Alien" type of arcade game or a text adventure.

The arcade section begins by providing a "doodles" listing and then gives a choice of routines for putting flesh on the bare bones. These include a variety of sprite designs for both goodies and baddies, and a fairly comprehensive range of simple sound effects. The programs then produced are well structured, though inevitably they end up as variations on the same theme. Nevertheless they are well conceived and would be sure to inspire further experimentation.

The adventure section is slightly different, in that the listings provided produce just one game, although suggestions are made as to how it might be varied.

Jean Frost's book is unusual and interesting, and should provide both enjoyment and inspiration. It treats the subject simply but thoroughly, and is good value for money at £1.95.

Publisher: Prentice Hall

(UK edition)

Price: £11.00

Reviewer: Jack Cohen

This guide to the IBM is the best reference book I have read since Ratic's *Wat's Programming the PMT-CRIM*.

Using the DCS, diskette formatting, diskette organization, and an overview of the DCS and commentary on ROM routines are amongst the topics covered.

Other chapters include Block Access Programming, which explains the use of Block and memory read/write commands in a clear and understandable manner.

DCS protection is covered fairly fully although some advanced protection methods are not mentioned.

Commodore's data encoding scheme is clearly explained, and sector headers are analysed as part of the explanation. DCS error codes and messages are documented and explained in

required reading especially if you have ever lost information on a diskette. Program listings are easy to understand, and control characters have been covered to readable form. There are programs to edit a disk and to create errors.

I have typed in several programs and have not found any that would not work. I recommend this book unreservedly to all who desire a thorough understanding of the IBM disk drive.

Bad timing

Book: *Introduction, Games and Sound for the Hi-20*

Author: Tony Fisher
Publisher: Prentice-Hall

Price: £8.4

Reviewer: David Stephenson

This American book is well bound and laid out, but it has come at the wrong time; its best market would have been shortly after the Hi-20 was launched!

The book can really be said to supplement the manual provided with the machine. The program examples given are mainly short and simple, but are very fully and comparatively explained, even to the extent of naming which keys to use to enter them — perhaps too comparatively in places, as the explanations are longer than the programs they explain.

Also, many of the programs are almost identical to some in earlier chapters, or even the same chapter. For instance, in Chapter Ten, 8 of the 12 programs are the same except that an eight line PRINT statement changes (from a Christmas Card to a New Year Card to a Halloween Card and so on). As far as code, so use is made until the 12th chapter, and the only PASCAL used are for sound, and those from the 15th chapter!

The usual Appendix is included, covering Characters and screen/keyboard routines, but the most glaring omission is of *UNIX*'s. Not even a single mention.

In conclusion, a flabby but slightly misleading book which may still appeal to you if you find the Reference Guide a bit dull. What most can be said about a book including a program like "One-Eyed Gorfis Moving Left!"



The 1541 finally explained

Book: *Inside Commodore*

DCS

Author: Richard Emery and Gerald G. Nayfeld

detail.

The most important program listed will allow you to store the IBM's read/write head anywhere you want and read the unit header passing over the head.

The screen display shows where the head is, what track and sector was read, and displays any read errors that were encountered.

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ANSWER BACK

Data on sprites

I KNOW that I can only display up to eight sprites at a time unless using raster interrupts, but how do I go about storing more than eight blocks of sprite data in memory?

Colin Gordon
Fulham
Wiltshire

THE EIGHT sprite pointers are normally at location 2040 onwards (that is, the last eight bytes of the 1K screen memory). The range of each pointer is from 0 to 255, and therefore since each sprite takes 64 bytes these locations can point to any part of the 128K bank of memory currently in use by the Vic chip.

If banks 0 or 1 are used then you cannot place sprite definitions in the 80004 image of the character set, and this will restrict the number of sprite definitions to 128. If more are needed, up to 255 maximum, then bank 1 or 2 must be used. If using Bank 0, you will either have to lower the top or raise the bottom of Bank 0 to protect your sprite data. If you move the screen, then the eight sprite pointers will also move, and if you don't use the default character set then you must be provided. The answer to your question, then, is to POINT the sprite pointer bytes with the location in memory of the data to be used. This can be done within a program, for instance 2040 for sprite 0 location. If the data stored at 2040 is 200, then the location of the sprite data is at 200*64 = 12800. If using bank 0.

If POINTing 2040 with 100, then new data can be accessed at 100*64 = 6400. So your program will POINT to the new locations as required, and then you can use many sets of eight sprites.

Practical advice

I RECENTLY bought a spreadsheet program, Practical 64 600k version.

Unfortunately, I just can't get it to work with the South-Carolina TP-1 printer. I spent hours trying the different setup values, but to no avail. Can you help?

Allan Van
Wyke/Ox-Wall
Oxford

IF PRACTICORP cannot help, I suggest you try Discow Trading Co of Devonshire House, 51 High Street, Exmouth, Devon, who distribute the TP-1 printer.

Out of memory

I HAVE WRITTEN a program approximately 17K long, and tested it successfully. But after running the program for about five minutes I get OUT OF MEMORY errors on various lines. Can you give any assistance?

J. M. White
Coopers
Worce

IT IS NOT so much the size of the original program that matters, as the routine size. It seems as though a large number of variables, strings and arrays are being created when the program is run. Check the amount of memory remaining after getting the OUT OF MEMORY error using the FREEBIE method described in previous issues, and you will find a small amount of memory available. Large arrays, strings and variables use up a great deal of memory, and the remedy is to cut the number of arrays, possibly reducing the number of players in your game. Do you need to keep all the data throughout the game? If not, then re-use the arrays for later data.

Epson options

I AM THINKING of buying a printer which has to meet certain requirements. The print speed would have to be at least 100 cps, buffer storage, dot matrix, 18 cps and up to 12 inch paper, tractor and friction feed, capable of printing on hi-res drawings and able to be coded backwards and forwards by a knob in the side. Can you give me some ideas, what sort of price I would have to pay,

and suitable interfaces?

Andrew Black
Borough Green
Kent

I WOULD RECOMMEND the Epson FX-80 as being closest to your requirements. Optional interfaces are RS232-C and IEEE 488, amongst others, and the standard is the Centronics style 8 bit parallel interface. Print speed is 100 cps, with 2K buffer and sleep capability. See the printer demonstrated with the software you wish to use before you buy so that you can be certain of compatibility with your program.

Assembling the Vic

I HAVE HAD a Vic-20 for a few years and wonder if you can give me any advice on books teaching assembly language, with an assembler and disassembler included in the package.

Paul Newman
Colchester
Essex

THE Beginners Assembly Language Programming for the Vic 20 by P. Holmes in the 8y Watson series from Hamlyn, 1, Stamford House, Bath Place, High Street, Barnet, London, 01-403 4158. Price is £15 including a cassette which contains an assembler program. The manuals used are not standard, but should prove useful.

Many low assembler and disassembler programs can be obtained by joining KPLUG, for instance Vic Microcom, a public domain program.

Anagram of Gemini

I RUN A SMALL mail order business as well as being properly. I have a dot with dot device and printer, and need a good user-friendly accounting package with a good manual, which would work on a daily 'morley' assembly basis and print accounts in sufficient detail to pass muster for VAT and IRS. It would not be necessary for the program to link with Receipts and Superbase but

it would be a bonus.

Christopher Wright
Lyham
Lancashire

THE GEMINI cash book/VAT/financial accounts program, or Anagram, which includes sales, purchase and account ledgers. Make sure before you buy that the software fulfils all your accounting requirements. Gemini is at Unit 21, Deane Way Trading Estate, Deane, Lancashire, 0205-263165. Anagram at 48A, Queen Street, Thornton, West Sussex, 0402-50333.

Clearing sprites

MANY TIMES I have been writing programs on my 64 and found that I'm unable to clear sprites from the screen. Can you explain how to do this?

Merlin Huxley
Chalfont St Giles
Buckinghamshire

USE THE following to turn sprite '5' on and off.
POKE%209,POKE%32009
OR%5 to turn on sprite number '5'.
POKE%209,POKE%32009
AND%15-1700 to turn off sprite.

Cobol questions

I HAVE a Commodore 64 and a 1041 disk drive. Is it possible to get the language COBOL to run on it?

Could you also tell me in what order I should switch on my computer and disk drive, the manual says the computer should be switched on last, while INPUT magazine says it should be switched on first.
F. C. Bennett
Bromley

YOU'LL need the CP/M cartridge from Commodore to run COBOL, and it's not yet available. The manual is eight computer last.

If you need help with a technical query or problem write to
Jack Cohen,

Commodore Horizons,
12-13 Little Newport
Street, London
WC2E 8JD

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COMMODORE 64 DATABASE — DATAFILE

Powerful system includes print database records, lists, labels, reports, GDS, copy, refreshments work, user defined fields, memory check, save numbers lists, multi field concatenation, group and sort-out lists, queries, etc. Fully menu driven with comprehensive easy to use instructions.

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IBM 64 formatted

version £1.45
disk £10.45

COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor, facilities include — large text buffer, auto centre, variable tab, insert, amend, delete, copy, move text word count, right justify, paging, join files, multiple file handling, print skipout text etc. Fully menu driven with comprehensive easy to use instructions. Great value.

1 disk disk formatted
1 disk 64 formatted

version £3.25
disk £10.25

All programs with full documentation and guarantee and can be used with all direct connect CBM64 printers including 1525 printers/terminals. Also most terminals with suitable hardware interface. Price includes fast delivery by first class post.

DirectPost to: **A & C SOFTWARE**

Dept. 1, 78 Oakdale Gardens, Farnham, West Midlands SA5 2JF

COMMODORE 64, Maths Race and Spins Designer. Two great Hilltoppi programs for one price! **Spins** £4.95 and **1-100** to **Black Hillary**, 27 Hamble Avenue, Borewater, Cambridge, Surrey GU17 5HF.

COMMODORE 64 disks: *Open City, High Five, House of Ladies, Slinky, Snow Shoutie, Aster Challenge, Fantastic Forest, Superdino, Get Off the Garden, Vortex Reader.* All originals, £5.50 each.

VIC 20 games: *Cloudburst, Star Wars, Arma, Alien, 8020, Mario, Asteroid, Scramble, Alan Attack.* All originals. Tel: 0924 628893. Reservations price.

VIC 20 Geographic, History, Physics, Education books for sale, £5 each, £12 for the 30 Spinn-A's in sets for former users! Buy now for November books and (ask) **Robert Sparks**, 48 Southampton Lane, Epsworth, Northants NN12 8AA.

VIC 20 cassette for sale. *Tap, or unsee* from £1.00 up to £15.00. *Cardinals* all £8.00. *Comes Great! Live the News* £8.11 £28.95. *Vic 20* also for sale, only £79.00, 14 months old.



WANTED: Simon's Basic, Gavette, Colour Monitor, 1541 disk drive, M808811 printer, cash waiting. Tel: 01-844 5383

FOR SALE: American Spinn book, includes every thing you need to know about Spinn. Cost: £15, sell for £5, also Melbourne Hoop game book £2, Software 64 utility program £2, Plans, Japan, Newcastle £20000 offer now.

For more detailed information please write to: *See above, then send a note (with return of completed form) to: A & C Software, Dept. 1, 78 Oakdale Gardens, Farnham, West Midlands SA5 2JF.*

IBM 64 software from Rocket Concepts: *Mastercode* — a game of logic; *Robotics Attack* and *Space Station* — arcade games; *only £2.95 each.* Also *Block Control* and *Telephone Directory* programmes — for business and home use — both only £7.95 on disk or £5.95 on tape. For orders or info contact Ian Hooper, 39 Larkhall Rd, London N16, Tel: 01-800 7171.

VIC 20 104 spreadsheet BAMB — many software titles or will send for 64 games. *Photo Data* on Disking 100000 000-100 after 1pm.

GERMAN VIC 64 user wanted for English use in GB, I want English software and I have German software go to German Address Office, Tennessee 64, 4200 Oberhausen 1, Germany.

VIC 20 word processing: *Tags or one*, needs 9-11k, and a continuous printed or serial printer. Full facilities plus footnotes, headings, mail merge, pagination and much more! *Johns Ed Matthews*, 29 Park Lane Road, Kingston, Surrey KT1 5TD.

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IBM 64 software to swap or sell for: *Arma, Aster Challenge, Scramble, Superdino* & many others. Also *Japan's Ace*, wanted, price up to £15. *Quarkbot* printer for sale £7. *Chris Cunningham*, 92 Theobald Road, Luton, MK1 8SD 0264 71 8212.

IBM 64 simultaneous equation solver: *Spinn* vol. 18 18 equations looking for the using Gaussian elimination with partial pivoting and use all answers displayed. **Send £5.00 (postal or £5.00 direct) to:** Ian Gordon, 10 Park Road, Warrington, 9-10-1, South 913 020.

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Everyone's a winner with Beyond

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HELL, NOOK! Miroz Club has developed a computer-controlled train layout, consisting of track, four carriages, an engine, and a device for decoupling carriages (they couple together on contact with another carriage at with the rear end of the engine). The engine is shown in the corner of the diagram, directly over the decoupling device. The system is being exhibited at the local Robotics Show, and visitors are invited to program the train so that it picks up all four carriages and pulls them around the track in the order shown in diagram B. What is the SMALLEST number of times the decoupling device must be used to achieve that?

If you solve this problem you could win a fabulous *BEYOND* software package. TWENTY winners will receive copies of *Pit Warrior* for the 64.

TWENTY runners-up will receive copies of *Peyton* for the 64, in which you control the *Retna 3* megacomputer, coping with alien attacks, supply problems and saboteurs in a complex moon base. EVERY ENTRANT will receive free membership of the *BEYOND CLUB*, and a voucher for £1 off the *BEYOND* game of their choice with the next edition of the *Beyond Club Newsletter* (published April/May 85).

SO . . . solve the problem, and write the number on a POSTCARD with your name and address. Don't forget to complete the tie-breaker in an apt, original and amusing manner in 15 words or less. *Beyond* games are a step further so because . . .

Send your entry to: *Beyond Competitions*, Commodore Horizons, 12/13 Little Newport Street, London WC2, to arrive by the last day of January. Results will be announced in our March issue. Normal competition rules apply.

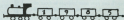
The winners of the November Danger Mouse competition are: 5 Embury of Strickon-Trent; 8 Asale of Gloucester; 5 Burnett of Cheshamfield; 8 Bean of Guildford; 8 Pike of London; 5 McCarthy of Newark; C Bray of Sussex; K Chong of Chesham; W Asale of Newcastle; 8 Clodier of Fareham; J Nicholson of Torquay; A Love of Wigan; M Howell of Edinburgh; M Hensbury of Arlesey; M Murray, London; S Bhagat of London; S Corrie of Dudley; C Whitcombe of Newcastle; C Hedline of London; and M Jenkins of London. Each will receive copies of the *Creative Sparks* games *Beetle Trouble* and *The Black Forest Chateau*.



Train layout



Diagram B



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◆◆◆NEW RELEASE◆◆◆

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