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PRODUCTS USERS GROUP

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# INDEPENDENT COMMODORE PRODUCTS USERS GROUP

## newsletter

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## EDITOR'S NOTEBOOK

Well, I was nervous that we would be short of copy for this issue, but y'all have responded magnificently, and promptly, to my plea in the last issue, and even without the usual 20+ pages from one of our regular contributors, we have a fat and lively issue. Two outstandingly interesting articles in it are Mike Todd's wanderings in the back alleys of Prestel (p75) and David Malcolme-Lawes's review of the 8296 GD (p89), reprinted by courtesy of South East. This is how I feel the newsletter should be, with contributions from all sides, rather than half contributed by two or three committee members.

Aficionados of the 'Midnite Software Gazette' will be also interested in the announcement on p161 that two of us are trying to organize its distribution in the UK. Those who don't know 'Midnite' may wish to take advantage of the introductory offer to have a look at a copy, but you are warned that it is likely to be addictive and to lead you to subscribing regularly.

Two new developments have aroused my interest recently. One is the hand-held optical character reader featured in the last 'PCW'. When you think that the best OCR costs about £80,000, and the cheapest until now is £8-10,000, this device at £399 is a remarkable breakthrough. As the PCW review points out, it may be only a marginal advance on a good operator for entering straight text, but for capturing things like lists of numbers or codes, so difficult to key without error, it comes into its own. Of course the ultimate answer to codes is a bar code reader, but that is a rather specialized business. Certainly just to run the device across a line of words or figures and see them come up a second or two later on one's screen is exciting. And surely there will soon be improvements and competitors.

The other interesting thing was the news of a new laser printer from Apple. At roughly twice the cost of the low-price lasers currently available, it is claimed to produce results that come very close to typesetting quality. I haven't seen any output yet, but again, even if the prototype does not quite live up to the advance razzmatazz, it would seem to me that very soon we shall see cheap laser printers that will constitute a major threat to those unions whose attitude is reminiscent of the bees at Mevagissey which, I was always assured in childhood, fly backwards to see where they have been. Who knows? Perhaps in the not-so-distant future our newsletter will be silently laser-printed instead of being clattered out on my Qume.

HdeG

## A FURTHER PEEK AT PRESTEL

by Mike Todd

Last time, I gave some ideas for those wanting to have a quick look at PRESTEL, including details of the free-access demonstration identity number and password. Since then, there has been a great deal of publicity about the 4444444444/4444, access since it is the way in for those wanting to use the "4-Computer Buffs" and Nottingham Building Society bulletin board service. I have not yet had a go at this service, called the 'Bullet Board', but it may be worth having a look at if you get a chance.

One thing that I find very frustrating about PRESTEL is that there are many areas which update so frequently that it is necessary to go on-line almost every other day so that you don't miss anything.

Other areas update very rarely and it is difficult to know when and where to look. Therefore, I have a rough plan for each session so that the telephone call is used reasonably efficiently.

My first port of call is always MicroMouse. His starting page is \*800651#, with route 8 from this page leading to a chat page, updated daily (more or less), with interesting news and gossip in the world of communications and hacking. There have been some very interesting stories here on the subject of hacking, US style - with tales of woe about legal proceedings and penalties for those caught with their paws in computers they ought not to be in. Although the hardware and software stuff is largely Spectrum-oriented, the chat page is worth a look on each visit to PRESTEL.

Next comes the main MicroNet-800 news page on \*8001110#, updated many times each day (including weekends); there is often a lively round of news and gossip from the wider world of computing. It appears only possible to see stories that are listed on the main page, so that in a busy week, you could well miss stories from a couple of days ago.

Watch out when there are exhibitions on, since the stories come thick and fast (and are usually excruciatingly boring), and you could miss items as recent as earlier the same day! At least each story is dated in the index.

There is also a computer news page within the VIEWFAX area - on \*2582000#. This is updated slightly less frequently, but is often worth a read.

VIEWFAX also have their own version of MicroMouse, known as the MicroGnome which is worth an occasional visit but the updates seem very sporadic, and I tend not to bother more than once every week or so.

Two other computer news areas are worth a once a week or so look. The first is obviously ICPUG's own area, with the important page being \*81021320#. This is updated as often as material is available, usually at the weekend.

ClubSpot also has its own news page on \*81000# but I have rarely found anything of interest and only check it once every couple of weeks when I remember it's there.

For news on PRESTEL itself, check pages \*6565# and \*420402#, and for information about the number of PRESTEL users, or statistics on Mailbox usage, check pages \*65659# and \*48600#.

World news is available on \*20200# (with weather on \*202009#), both of which are free. There are many other general news pages, but most of these cost money.

It's worth rummaging around the ClubSpot area in the \*810 . . . series as there are several specialist groups represented. If you do, make a note of the page numbers and pop back now and again - you can often find some interesting items.

In fact, this approach to PRESTEL has a lot to recommend it, but a note of caution needs to be sounded. I often dive in to the many databases within PRESTEL and key page numbers just to see what's there - often based on a pattern of page numbering within the rest of an area of PRESTEL. The problem is that you are picking up pages more or less randomly, and you could suddenly come across a page that charges for the privilege of looking at it. When this is the odd 0.5p, or even up to 2p or so, maybe you won't mind, but the page could well have a price tag of anything up to 99p and you'll get charged whether you wanted it or not.

There are a number of interesting areas, unrelated to computing, that I often visit now and again. Most of these rarely change, but are sources of useful information or just simply make interesting reading.

For instance, there has been a lot of talk in the media recently about those dreaded 'E' numbers listed on food packets. There are two lists on PRESTEL that contain the numbers and their chemical names. One of these charges a fee to look at, the other (from the Ministry of Agriculture Fish and Food) is free. The index is on \*203441# - just

follow the numbers.

If you're interested in seeing a review of what's in PRESTEL, then RAKER is worth a peek on page \*360161#. This is updated about once a month (sometimes less often) but it can make amusing reading as RAKER often digs out the worst and the best pages on PRESTEL.

If all you want is a who, how and where guide to PRESTEL then go for page \*58307# but for the more technically minded, maybe a trip into the PRESTEL engineering area could prove interesting. This starts on page \*692130# (within the Service Centre area - \*6920#) and includes little snippets of technical information about BT equipment and some technical problems. There is also a sequence of dealer test frames on page \*69272#.

I was recently asked by an ICPUG member (through PRESTEL MailBox) how could get hold of a copy of the 'Inside Commodore DOS' book. Well, the answer was sitting in PRESTEL.

There are actually two bookshops which will obtain any book for you, provided that it is still in print, and you know its ISBN (that great long number printed on the back of the book). Ordering is done by credit card, with a charge for post & packing; in this particular case the book arrived two days later!

The two book-shops concerned are 'Book-Link' on \*3531# and 'Peter's Bookshop' on \*202274#. There are others, but as far as I am aware, these are the only two offering this particular service.

Each PRESTEL frame is actually in two halves, the 'front' is what you the user normally see.

The 'back' of the frame is hidden from view and is accessible only to editors. It contains such information as the price of the frame, whether or not it should be made available to users, details of any closed user group membership required to access it, the type of frame (normal information frame, or a response frame) and the page the user should be taken to when he presses any of the route numbers 0 to 9.

In the normal course of events, pages are of the information type and these simply send the characters that make up the frame down the telephone line and stop at the end of the frame. In this way, about 1000 characters are sent for each frame.

However, it is possible for some editors to create so-called 'dynamic' frames that are not straight screenfuls of information.

Dynamic frames take several forms, and can be used to brighten up graphical displays. There is a section demonstrating these types of frame starting at page \*601601# and a browse in this area is worth five minutes of telephone time.

Wherever you live, I would suggest calling up page \*199# (the main alphabetic index) and look up your home town. If it is there, make a note of the page number as it could be useful.

Living in Welwyn Garden City, I often have a look around in the 288 area (HERTS-288). One of my favourite areas within the whole of PRESTEL is page \*2880443# and you will sometimes find me in one of the establishments listed on page \*288044353#!

Well, that's a quick foray into the world of PRESTEL - obviously, you need to be a registered user to get the pages I have mentioned. Is it worth it? Well, I think so.

Before I leave the subject for this issue, there are a couple of other interesting areas worthy of note.

Probably one of the areas of most general interest starts on page \*401# - the database is terrific, especially in view of the fact that the Information Provider has been working on it for years.

If you want an example of a 'gateway' (that is where the PRESTEL computer itself calls up another computer) try page \*8881888#.

There are also some odd and interesting pages around \*4991# - oh, and don't forget to check page \*92# periodically!

There is an odd quirk within PRESTEL that you may like to look at next time you're finishing off a session (as it will probably log you off).

First of all, call up a response frame (the MailBox frame \*77# will do), fill it in with any valid number (your own will do), but don't send it (key 2). All this does is reset PRESTEL as though you'd just logged in - the first page error you get (either MISTAKE or PRIVATE) will be a complete page of explanation and not just the single line at the bottom of the screen.

Call up page \*942# - this is a PRIVATE page, and you'll get the appropriate full-page response - now, press # to take you to the next frame and you'll get a rather odd message. At this point, pressing a number to route out of this page will do one of several things. It will either take you back to the main index, tell you your call has not been connected (!) or tell you that service to your number has been



withdrawn and disconnect the call.

Because PRESTEL is capable of rapid updating, some of the pages mentioned may not exist as described - if that does happen, I apologise in advance.

If you do discover any interesting areas, or have your own favourite sections, drop me a MailBox. My number is 919991913.

Finally, on the subject of MailBoxes, I get several technical queries via MailBox which, in general, I'm quite happy to respond to. However, I would prefer technical queries in writing as they are easier to handle in a busy schedule. It is difficult to provide more than a very brief reply on a MailBox, and MailBoxes often get lost!

If you do send me a MailBox with a query, and don't get at least an acknowledgement within a week then MailBox me again as I'll either have lost the MailBox (either on-line, or the printed copy) or have forgotten about it.

--oOo--

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## 1541 FLASH FOR THE 64

by Chris Wright

One of the greatest drawbacks with the 1541 is the speed of the thing or rather lack of it. Why it has to be so slow no one knows - or rather Commodore do but they keep it under wraps like everything else. Human beings are a curious species and I don't think any of us like mysteries and most of us rise to a challenge. This is so with the 1541 as there are a few companies in North America who have produced go-faster inserts for this disc drive. One such unit was reviewed last year and called 1541 EXPRESS (Sept p346).

Whilst being initially enthusiastic about this, a call to RAM told me that there were a few problems, one being that the TRIPPLER cartridge would not work with EXPRESS until FASTCABLE was released and that added another 49.90 to EXPRESS. This revelation prompted caution on my part and I told myself that more such devices, and probably better ones, would soon be on the way, so I waited. Not for long, as Skyles Electric Works in California brought out 1541 FLASH. (SUPERSOFT are the agents in this country and have now got these units in). I make no excuse to myself for spending 89.90 on what some may say is a luxury but it saves me a lot of time sitting at the keyboard and time is money.

What do you get for this large sum of hard-earned money? Well, the manual is a copy of the American one but SUPERSOFT do say they are having one printed and will supply it on request when this is done. However, the detailed explanations in the manual are excellent, as they need to be since the disk drive and the Computer both have to be opened up. The hardware consists of a replacement Kernal ROM assembly, cable, socket and a small board which also allows you to insert the original Kernal piggy-back, thus allowing a software and hardware switch from slow to fast speed; a new 1541 operating ROM assembly (keep the original assembly as it can be replaced if necessary); a cable between the drive and computer and lastly a cablecard that plugs into the user port and thoughtfully has a socket for modem and centronics output to work normally.

As I said, the manual has detailed instructions for the insertion of these parts with diagrams and pictures with the necessary component part numbers listed so there can be no mistakes. I must admit to approaching this stage with trepidation but once into it I found it simple and in 15 minutes everything had been done.

On powering up, the screen told me that FLASH was installed.

EASYSRIPT was loaded and in no time at all was installed in memory. Fantastic! I tried it again and timed it: 20 seconds, a third of the normal time! Out came all the other programs and sure enough the loading time was down to a third and sometimes quicker than that. However, saving programs is only twice as fast as normal, but where this little gem comes into its own is with random and sequential files within a program.

I am now referring to SUPERBASE 64, which I use every day. This database is a great program which I think is let down by the slowness of the 1541. Not any more. Selected files are put up on the screen in less than a second (2-3 seconds before); exporting a file is down by two-thirds the normal time. Assembling an "hlist" on a 250-record search took 1min 20secs (3min 50sec before). I could go on but those of you who use SUPERBASE regularly will see that FLASH allows SUPERBASE to run fast and that can't be bad. Below I have timed various programs with the slower times in parentheses.

EASYSRIPT loaded in 20sec (48sec); a 71-block file of seven pages loaded in 13sec (56sec) and 10 blocks - one page - in 2 secs (9secs); SUPERBASE V1 loaded in 45secs (1min 55sec); HOBBIT - 175 blocks - 34 secs (1min 57sec); COLLOSSAL ADV by Jim Butterfield 23sec (1min 54secs) and this also ran faster in its search through the files.

Also built in are the DOS wedge, and extra editing commands, including the escape commands to ASCII printers and better cursor controls, with advanced programming controls that can be written into a program as CHR\$ values, and you can adjust speed of data transfer, peek into the processor and put on the screen what it is doing at any given moment, de-bug disc files and so on.

I must admit that I haven't had a chance to use all the features but those I have used caused no problems, except for one: on SUPERBASE during a lot of searches lasting an hour I got the ID, MISMATCH error. This was solved by initialising and loading the 'start' program again and carrying on where I left off. One further thing I noticed was the drive never really got as hot as before, probably because its access time is considerably less.

As the reader will no doubt gather, I am impressed with FLASH and now couldn't bear to be without it (those bad old days). Format a disc in under 8 seconds - eat your hearts out non-FLASH-users! It costs £89.90 from SUPERSOFT. Perhaps they may be persuaded to allow a small discount to members?

--oOo--

# ICPUG COMPETITION RESULTS

Mike Todd

Well, at last . . . the answers to the 'Great ICPUG Competition'. As I write, I don't know the winners of this second phase. Their names will appear in the next (May/June) newsletter.

Although there were a couple of trick questions, most were straightforward enough, requiring only a look through back issues of the newsletter or a good memory! In some cases I have given the particular issue concerned.

Some questions may have appeared ambiguous, but in most cases there was only one correct and clear-cut answer. For instance, the POKEs in question 0F apply equally to VIC and 64 but the SYS is meaningless on the 64.

The first section was a mixture of commands and POKEs associated with specific machines.

- 00 POKE 41229,80 - only the 64 has anything obviously POKEable at this location (\$A10D), and then only when the ROM contents have been transferred to RAM. The location is part of the BASIC keyword table, the location of the 'L' in LIST. The POKE changes this to the character whose ASCII code is 80 - 'P'. (July '83 p329)
- 01 POKE 808,239 - disables STOP key on 64. The location is valid on all other Commodore machines, but only on the 64 does 239 make sense. (May '84 p214)
- 02 POKE 781,5: SYS 60045 - clears line 5 on the screen of the VIC (Mar '82 p75)
- 03 ZONE 5 - Although this looks like the COMAL command, the '≡' sign is missing! One of the trick questions.
- 04 PRINT CHR\$(130);"ERROR" - CHR\$(130) is only valid on the C16/PLUS4 and causes the message to flash (Sept '84 p311)
- 05 PRINT#9,CHR\$(85);CHR\$(58) - the two CHR\$ characters are equivalent to "U:" and this is recognised by Commodore disk drives, causing the drive to reset as if switched on. (Nov '84 p432)
- 06 POKE 243,122: POKE 244,2 - these two locations are valid on all Commodore machines, but the fact that they are POKEd with the address \$027A gives a clue. Setting colour RAM on the VIC/64 to \$027A (as many suggested) doesn't make sense. The true use is on early PETs (BASIC 1) and it sets the pointer to the start of the cassette buffer - necessary because of a bug in this early BASIC.

- 07 DCLEAR U9 - initialises drive from 700 series (NOV '84 p440)
- 08 POKE 59458,62 - this sets a data direction register and was used on early BASIC 1/2 PETs to speed up the screen display.
- 09 GET#2,A\$: SYS61827 - a bug in BASIC 2 sometimes caused problems with non-Commodore printers after a GET# from disk. This SYS solved the problem. (Mar '83 p220)
- 0A ON KEY "R",: CALL RESET - In Simons' BASIC this causes the procedure named "RESET" to be executed whenever "R" is pressed. (Jan '84 p32)
- 0B SYS 64721 - only in BASIC 2 does this SYS do anything sensible - it causes a hard reset as if switching on.
- 0C SPRINK 1 TO 5,3 - in BC BASIC on the 64, this sets the colour of sprites 1 to 5 to colour 3 (cyan). (Nov '83 p510)
- 0D VDU 65 - another trick question. This command is from BBC BASIC! It is equivalent to PRINT CHR\$(65). Quite a few got it right.
- 0E PRINT CHR\$(155) - on 64 sets colour to light grey (also PLUS4/C16).
- 0F POKE 642,16: POKE 644,30: POKE 648,30: SYS64824 - this is one of the reconfiguration techniques on the VIC and it restores the VIC as though there were no memory expansion at all. (Jul '82 p184)

Next to the Commodore products.

- 10 1525 - dot matrix printer for 64
- 11 2016 - early 16k PET
- 12 1910 - Radar Ratrace game cartridge for VIC
- 13 7501 - the processor in the PLUS4/C16 - (it appears that some C16s and PLUS4s now have an 8501 processor)
- 14 264 - the name given to the machine which became the PLUS4
- 15 1542 - single disk drive (not yet seen!) repackaged 1541
- 16 802 - the MPS802 is a dot matrix printer
- 17 1502 - code for a roll of paper for the 1520 plotter!
- 18 1011A - RS232 interface cartridge for VIC/64
- 19 710 - the 128k computer
- 1A 6581 - the sound (SID) chip in the 64 and 700 series
- 1B 1101 - the DPS1101 is a daisy wheel printer
- 1C 1001 - the MPS1001 is a single drive version of the 8250, the number given to early VICs sold in some countries, and also the code for a printer.
- 1D 1531 - cassette unit for the C16/PLUS4

- 1E 901227-02 - the part number of the 64 KERNAL ROM (some thought it was the 1541 disk ROM but that is 901229-02)
- 1F 4030 - some thought this a mistype for 4040, 3040 or 4032 - I have never seen such a beast as a 4030!

Now the more general questions:

- 20 Where is F Bowen? - in the PLUS4/C16 ROMs (Sept '84 p312)
- 21 I fumble jet dirt (anag.) - Jim Butterfield
- 22 What does GCR stand for? - Group Code Recording - some said Garbage Collection Routine, and one said Graphics Colour Register
- 23 How many K of RAM in the 3032? - 33k! - who forgot the 1k of screen RAM - no, the interface chip registers don't count
- 24 His language is also a triangle - who? - PASCAL
- 25 Jail racket, M? (anag.) - Jack Tramiel
- 26 What was wonderful and cheap but became simple, at a greater price? This was meant to be SUPERscript which became EASYscript when Commodore sold it. (wonderful=super simple=easy!)
- 27 (bytes of VIC ROM)+(bytes of VIC RAM)+(VIC processor) - a tricky one this - there is 16k of BASIC+KERNAL ROM, 4k of character ROM, 5k of ordinary RAM giving a total of 25k (25600 bytes). Then there's 4x1k bits of colour RAM which strictly speaking aren't true bytes but are nybbles. (1024, 512 or 0 bytes were acceptable) and the processor is 6502. So the correct answer is either 32102, 32614 or 33126.
- 28 Scab mission? (anag.) - Simons' BASIC
- 29 Who or what are Ted and Sid? - TED is chip in PLUS4/C16 (also nickname given to the 264), SID is sound chip in 64 and 700 series.
- 2A When is  $5 \times 0.2$  not  $0.2 \times 5$ ? - when you take INT of them (on a PET, VIC, 64, Apple and so on)
- 2B Which is the odd man out: 6509, 7501, 6502, 6802, 6510? - the 6802 is not a 6502 derivative and is not used in Commodore machines.
- 2C Odd one out again: E843, 9112, E001, 0000? - they are all data direction registers except E001 (PET, VIC & 64)
- 2D Which executes faster: (1)  $A=A+1$  or (2)  $A\%=A\%+1$ ? - (1) as it doesn't require integer values to be converted to floating point.
- 2E Which of the two in 2D uses least memory? - integer storage of ordinary variables takes exactly the same number of bytes as floating point variables - however, as it doesn't use the '%' character, (1) uses two less bytes.
- 2F What is special about line number 351111? - it is one of a range of

line numbers that cause a crash in one way or another, except on the 700 series, PLUS4 and C16 (Jul '82 p214)

The following two lines on a PET take a certain time to execute:

```
100 Q=50: B$=TI$  
110 A=(2*Q)+0,417: A$=B$+"TEST"
```

The following modifications either cause these two lines to execute slower, faster, or make no difference. I've given an approximate indication of speed variation - +2% means it takes 2% longer.

Many realised the way to check this was to write a short program with these two lines as the contents of a long FOR...NEXT loop and then time how long the two lines took to execute. There were some who included the modification lines in their loop but the question specifically asked the difference in time for the two lines given. A loop of around 1000 is a minimum to spot the small differences. Because TI\$ takes a variable length of time to evaluate in line 100, it is necessary to preset TI\$ at the start of the run otherwise the results will vary.

- 30 +2% Add line 10 X=50:Y=372,3
- 31 +3% Change Q to Q% and A to A%
- 32 -10% Delete line 100 and replace Q with 50 and B\$ with TI\$ in 110
- 33 0 Change line numbers to 10000 and 20000
- 34 +1% Add line 10 C\$="TEST" and replace "TEST" in 110 with C\$
- 35 -0,5% Put all on a single line 100
- 36 -0,5% Run the two lines on a British 64
- 37 -1,5% Remove brackets from 110
- 38 +1% Add line 10 DIM A(100),Q\$(100,2)
- 39 -0,7% Add line 10 X=2 and replace 2 in line 110 with X
- 3A +10% Change B\$ in 110 to TI\$
- 3B -34% Run the two lines on a 710
- 3C -10% Change 0,417 to 417/1000
- 3D +1% Change Q to QQ and B\$ to BB\$
- 3E 0 Change line numbers to 1 and 2
- 3F +1% Add spaces to make lines more legible

Some of these alterations produce surprising answers. Changing line numbers (as in 33 & 3E) makes no difference to speed since they are





resigned towards the end of February. Bob Gleadow is still Managing Director UK, but he is not in the UK, and sits with the board in Hong Kong. There were many entries which had the name Stanforth - I don't now where this version of the name came from, but I counted it as correct.

4A The PLUS4 is the production version of two other machines, what were they called? - 264 and TED. These are really three different names for basically the same machine. Several said 264 and 364; the 364 differed from the 264 in that it had a numeric keypad.

4B About which micro did Jim Butterfield write his first book? This was called 'The First Book of KIM'. The KIM was a simple, single board computer, using the 6502.

4C How many 64's have been produced in the UK (approx!)? - about a million - Commodore seem reluctant to quote the exact figure. They do say that a total of two million machines have been produced at Corby, including the recent runs of PLUS4 and C16s.

4D What were the US and UK names of the 64 compatible machine that never appeared on the market? - they were the MAX and ULTIMAX (also known as the VIC10 as well)

4E Uncle Jack decamped and bought . . . who? - ATARI

4F In what year did Commodore start business? - 1955

It wasn't really that bad, was it? Although most of you found it difficult, there were many who enjoyed answering the questions. Maybe we'll have another soon.

Some people suggested that the quiz should have been easier, or we should have had a software competition. I had considered both these alternatives. By making parts of the quiz difficult, and others easy, it was intended that it should appeal to all levels of user.

A software competition requires very much more organising, with judges and much time spent evaluating entries. We just don't have that sort of time available.

Anyway, I was pleased to hear from those that did have a go - maybe next time we will have two competitions, one for the advanced hacker and the other for the beginner.

--oOo--

## FAKING EVAL - 'INPUTTING' A COMPLEX EXPRESSION

by Lee Allen

Commodore machines have no means of INPUTting an expression such as a mathematical equation. For example, suppose you wish to plot a graph: you need a way of getting your equation into the computer while the program is running. On most microcomputers this is very difficult to do although it is worth mentioning that the BBC micro has a function called "EVAL(x\$)" which does just this.

When faced with this problem on a PET my initial reaction was to INPUT a string and then analyse it but I soon found that the routine necessary became longer and more complex than the applications program itself!

The snippet below shows how the "EVAL(x\$)" function may be faked on a PET by crafty use of the screen editor while the program is running. (The method should work on all Commodore machines although the POKEs will need alteration)

The method relies on the fact that a program may be interrupted and then restarted by the STOP and CONT commands. Lines 20 and 30 clear the screen and position the words . . . "x= <expression>" and "cont" at just the right place on the screen. Line 40 puts the cursor in the appropriate place and line 50 forces two <return> codes into the keyboard buffer.

When the program stops at line 60 the <return>s pop out of the buffer and force the computer (now in command mode) to evaluate the expression and immediately restart the program by performing the 'cont' command.

Any valid expression may be INPUT including PI, TI, trigonometric functions, etc, even functions involving variables set up in the program itself.

```
10 input x$
20 print "<clr> <crdn> <crdn> <crdn> <crdn> x= ";x$
30 print "<crdn> <crdn> cont"
40 print "<home>"
50 poke 158,2:poke 623,13:poke 624,13
60 stop
70 print "the value of x$= ";x
80 goto10
```

--oOo--

# THE 8296 GD - COMMODORE'S NEWEST PET

David Malcolme-Lawes

Some months ago I learned that Commodore was about to launch a new business micro which would be fully software compatible with the 8096. This was interesting because our laboratory now has a considerable investment in software running on 8032 and 8096 computers and so the purchase of a new system which could not handle all of this software would require the offer of a fairly substantial bonus in some other direction. I read the reviews of Commodore's new 8296 in several of the popular computing magazines and was immediately confronted with the fact that, while most reviewer's referred to the new machine as an upgraded 8096, it was quite clear from their comments that (without exception) none had used an 8096 for anything except running commercial software, none had had access to the high resolution graphics announced for the 8296, and none had spent very much time using the machine before writing their review.

When I made enquiries about acquiring an 8296 I found that three versions were available: the 8296, the basic machine in much the same form as the earlier 8000 series machines; the 8296 D, the computer with integral twin disk drives; and the 8296 GD, a version containing integral drives and high resolution graphics. The version of the new machine which arrived on my desk was the 8296 GD, and this review is specifically about that machine (I have no first hand experience with the other two models). Like all the other 80 column PETs these days, the 8296 GD is a separate keyboard machine (and so takes up more desk area than the old models). This one also has twin integral 5.25 inch disk drives - more about these later, and Commodore's new "low cost hi res graphik" as they call it. Most Commodore owners will be familiar with the row of three edge connectors protruding from the back of the PET (IEEE, user port and cassette port), and these are present on the 8296 where they appear to have been reinstated (after the IEEE connector and user port connector were both replaced by IEEE style 24 way Amphenol connectors on the 8096 SK model).

In common with most other equipment purchased from Commodore, the new machine comes with shambolic documentation - this system had a printed manual for the (old style) 8032, and addendum for the 8096, a second addendum for the 8296, a small pamphlet providing (inadequate) information on the hi res system, and a printed manual with several addenda covering all the Commodore separate disk drives. In addition there were several separate sheets of additional notes and corrections which appeared to apply to the 8296 D versions of the machine. All of this literature is comprehensible if you are familiar with Commodore machines, but it could be somewhat confusing for a first time user! Reading the second addendum (the one for the 8296) illustrated where

some of the reviews I had read obtained their limited information on the 8296.

Switching the machine on and typing in a few lines of BASIC one quickly discovers two novelties of the machine. First, it has a built in blower fan and becomes the first PET to whirr continuously - although not obtrusively. Second, the screen (which incidentally looks darker than the older screens before switch on) has a remarkably high persistence phosphor. In fact the screen persistence is so long that it is almost impossible to read the screen during scrolling. At first this seemed rather alarming, but I have now adjusted to the persistence and do not personally find it inconvenient. I still regard the PET's stationary display as being the best on any low cost machine - its perfectly steady, has excellent contrast and is easily readable for word processing. The display on the 8296 maintains this tradition.

At switch-on the 8296 behaves like a standard 8032 computer, having about 31k bytes available for BASIC use and the memory map identical to that of an 8032 as far as I could ascertain. (According to one of the loose sheets provided as an addendum to the several bits of documentation, the new video board in the 8296 D requires different screen controller timing for older machines. For this reason the tables in E-ROM are different from those in the 8032 and - according to the sheet - in the 8296.) However, the 8296 offers much more than the 8032 because it contains 128k bytes of RAM arranged in two blocks of 64k. One block is called the main memory and the other is the expansion memory. The expansion memory is used in the same way as on the 8096 and this is discussed later. The main memory structure is similar to that adopted in the Commodore 64 and provides a most welcome addition to the PET's capabilities.

Presumably a major constraint on the designers of the 8296 was the necessity to ensure that the machine was capable of running all 8032 and 8096 software - an excellent idea. I assume that it is for this reason that a new 8296 has only half of its main memory mapped into the processor address space at switch-on. The lower 32k of main memory maps to addresses \$0000 - \$7FFF, the higher addresses being occupied by screen RAM, ROM sockets, BASIC ROM, operating system ROM and the IO devices which control the user port, IEEE port, cassette port, keyboard and video controller - exactly as in the 8032. However, by connecting three jumper wires from the expansion connector pins RAM SEL 9, RAM SEL A and RAM ON (J4, pins 12, 13 & 14) to either toggle switches (which I haven't tried) or to the user port data lines PA0 - PA2 (user port connector pins C, D & E) one can progressively replace 2k or 4k blocks of ROM from \$9000 upwards with main memory RAM. The 256 bytes (\$E800 - \$E8FF) used for the IO circuits can similarly be replaced by RAM. Thus, with the jumpers connected to the user port as described, the BASIC commands:

POKE 59471,4 : rem set user port data register bits 0-2  
POKE 59459,7 : rem set user port data direction register  
for outputs on 0-2

switches in 8k of RAM to replace the ROM sockets at \$9000 and \$A000.

This is a useful facility. The ROM sockets at \$9000 and \$A000 in the 8296 GD are occupied with eeproms containing the hi res driver software and its associated BASIC extension. Thus my favourite programmer's utility chips cannot be accommodated unless I purchase a pager board. But I can insert my utility chips and use the monitor to save their content to disk, and then I can switch RAM into the address space of the ROM sockets and load (from BASIC) the software into this RAM and use it as usual. Needless to say I now have a number of redundant chips - but I did pay for their content.

Seven values may be poked into the three jumper leads to replace various blocks of ROM and IO devices. The eighth possible combination is not used - this corresponds to replacement of everything between \$9000 and \$FFFF except the IO devices at \$E800 - \$E8FF, and this combination requires a poke to the memory control register (see below). Details of which particular pattern is required for which combination of ROM and RAM are given in the 8296 addendum sheets, although it is worth noting that not every conceivable arrangement is allowed - thus the kernal (\$F000-\$FFFF) cannot be switched out while BASIC (\$B000-\$DFFF) remains in the map, although that is quite understandable.

Of course, BASIC may only address the lower 32k of main memory RAM directly (although PEEKing, POKing and SYSing to higher addresses works), so the main value of the higher memory at present is for holding machine code routines called from BASIC or large machine code programs which do not require the presence of the BASIC ROM. However, it is clear that as the machine is now very easily configured with kernal, IO and 56k of RAM (even without using the 64k expansion memory) the opportunity for Commodore to offer alternative languages is there.

The expansion memory (and in fact the top 4k of main memory) are accessed in a different manner - just as was the expansion memory in the 8096. The expansion memory is very useful and we now operate a number of systems which utilise this additional 64k. However, it is important to understand some of the housekeeping which is associated with the use of the expansion memory if its use is not to result in disappointment. Firstly the 64k of expansion memory is divided into four blocks of 16k, two of which (blocks 0 & 1) may be switched in to replace main memory or ROM addresses \$8000 - \$BFFF (not both at the same time of course), and two of which (blocks 2 & 3) can replace the main memory or ROM between \$C000 - \$FFFF. Control of which 16k blocks of memory are enabled at any one time is maintained by a write-only

control register at \$FFFO, the bits of which serve the functions listed in table 1.

When the expansion memory is enabled two of its 16k blocks replace all of the ROM/main memory above \$8000. Consequently it is not possible to use the expansion memory directly from BASIC as both the BASIC ROM and the kernal must be switched out if any block of expansion memory is enabled. This brings us to the most important housekeeping function required for use of the expansion memory - the correct handling of interrupts. On all PETS a maskable interrupt occurs 60 times per second, and causes the processor to jump to the address vectored by the bytes at \$FFFE & \$FFFF. When the kernal ROM is occupying these addresses there is no problem and the appropriate vector is available. But when the kernal ROM has been switched out \$FFFE & \$FFFF are bytes of the expansion RAM, and so some user action is required to prepare for these interruptions (and any non-maskable interrupts if the user is making use of these).

Table 1: Control register (\$FFFO) functions

---

bit	function
7	1= enable expansion memory: defaults to 0 at switch-on
6	1= enable IO peek through for \$E800 - \$EFFF
5	1= enable screen peek through for \$8000 - \$8FFF
4	reserved - should be 0
2&3	expansion block select bits
1	1= write protect for expansion addresses \$C000 - \$FFFF
0	1= write protect for expansion addresses \$8000 - \$BFFF

Bits 2 & 3 of the control register select which of the four 16k blocks are enabled according to the pattern:

\$FFFO bit	2	3	blocks
	0	0	0 and 2
	1	0	1 and 2
	0	1	0 and 3
	1	1	1 and 3

Bits 0 & 1 provide for write protection of expansion memory enabled in the specified address ranges, so that program or data in these blocks can be secured against overwriting, while bits 5 & 6 may be used to enable processor access to screen RAM (in main memory) and the IO PIAs and VIA over the relevant limited address ranges while the rest of the memory map above \$8000 is occupied by expansion memory.

---

There are two obvious ways of handling the maskable interrupts. The first is simply to turn them off when the expansion memory is activated (which can be achieved by setting the interrupt disable bit of the status register with an SEI instruction). This approach has a number of disadvantages for most of our applications (for example, it turns off the keyboard and the jiffy clock), but could well be appropriate in other cases. The alternative is to provide a vector in the high expansion memory blocks (ie both blocks 2 & 3 if both are to be used) which points to a routine in the lower 32k of RAM which can handle the interrupt. The example provided in the Commodore documentation - and the technique we have followed - suggests that this routine saves the accumulator and status register, turns off the expansion memory, pushes a return address onto the stack, followed by the previously saved status and accumulator, and then jumps to the normal interrupt vector. On return from the normal interrupt routine, a second user-provided routine re-enables the expansion memory and executes an RTI instruction.

It will be clear that all this activity does have a detrimental effect on the speed of the system if prolonged program activity in the expansion memory is underway. For this reason we usually avoid using the expansion memory for programs and concentrate on using it to store data which is moved in chunks to the screen or lower RAM when required and using routines which themselves reside in lower RAM. Thus the expansion memory is ideal for storing the text during wordprocessing, or data values read in from a laboratory instrument, or for holding screen displays which can be rapidly copied to screen when required.

A final point worth noting about the control register for the expansion RAM is that it is a write-only register - so the user's routines need to keep a copy of what is written to it in lower RAM. Listing 1 is a small section of the memory management routine of a wordprocessor (WORDPET) which we use extensively on 8096s and, now, on an 8296. The routine BEGIN (and its subroutine MINIT) initialises the IRQ and NMI vectors in both top blocks of the expansion RAM, and the location MEMMAP holds a copy of whatever is written to the control register \$FFF0. The routines IRQ and NMI are jumped to when the relevant interrupt occurs while expansion RAM is enabled, and the (single) routine RTIP handles the return from the PET's normal interrupt handling routines. The routines INPUT and OUTPUT allow for copying chunks of data between memory (main or expansion - selected by BLKSEL) and a disk file. The routines occupy addresses from \$7C00 - \$7FFF, and are called from a main program (PETSPEED compiled BASIC) in lower RAM. Similar routines move chunks of text between memory blocks and between memory and screen.

The G part of the 8296 GD is an emulation of Commodore's 512 \* 256 high speed graphic system. According to the small manual provided, the "8296 low cost hi res graphik" is available as an add-on to the 8296, and fits into the sockets normally occupied by the screen controller (UC9)

and the character generator (UC5). The emulation software comes in a 4k eprom which occupies the ROM socket at \$9000 (UE10), and the BASIC extension software in in a second eprom which occupies the ROM socket at \$A000 (UE9). The hardware is actually a circuit board which requires just a couple of soldered connections and the setting of a few DIL switches. The system comes with a diskette which contains a demonstration program to illustrate both the use of the hi res system from BASIC and the quality of the image on the screen.

Operation of the hi res system may be carried out in two ways. The first is by using POKEs and SYS commands (or the assembler equivalents), and to do this only the emulation system needs to be enabled (with SYS 9\*4096+3). The second approach involves using the extensions to BASIC which are listed in table 2, and to use these the BASIC extension ROM must be activated by SYS 9\*4096 (this initiates a SYS 10\*4096). The use of POKEs and SYSs is somewhat hampered by the total absence of any documentation on what to POKE and where to SYS to, although some minor assistance is available from the demo program and a few hours of trial and error taken with the optimistic assumption that the codes adopted will follow some logical pattern. However, it seems certain that direct use of the emulator is only for the very dedicated - except for the most trivial functions (like turning the display on or off from machine code programs). For that reason I will concentrate on the use of the BASIC extensions, adding simply that enough of these facilities are easily accessible from machine code or compilers (such as PETSPEED) that I can see no obvious advantage in ignoring the facilities provided.

The extended BASIC commands may be used as direct mode commands or by incorporating the keywords (together with any necessary parameters) into a BASIC program just like any other BASIC command, with the minor exception that any extended BASIC keyword which follows a THEN must be preceded by a colon, eg. IF Z=0 THEN : PLOT(X,Y,IPEN). The command INIT initialises the graphic emulator, performs a graphic clear screen, and leaves the system with the graphic display off (ie the normal display remains on), a mathematical coordinate system of X ranging from 0 to 1 and Y ranging from 0 to 1, and display window occupying the whole graphic screen, character sizes (1,1) - which corresponds to characters 6 pixels wide and 8 high, and the orientation, lintyp, mode codes and starting coordinates set to 0. INIT also results in the display of a message (cbm graphic rev. 1 on - format 512\*256). The hi res display is made visible with DISPLAY(1), and the normal PET display is restored using DISPLAY(0).

All of the plotting and character commands seem to be very straightforward in use, and the concept of a mathematical coordinate system makes the incorporation of graphic displays into existing programs relatively simple. The mathematical space defined by the MAP command is displayed on the screen within the screen window defined in



PSPACE, so in fact several independent pictures may be displayed on different parts of the screen by preceding each with an appropriate PSPACE command. The use of a pixel coordinate system is also available if required. Whichever coordinate system is used, the routines actually operate on a 4095\*4095 pixel space, of which only a 512\*256 screen is stored in real RAM and displayed. Consequently no harm is done by attempting to plot outside the screen.

The system offers a choice of line types, character sizes and two character styles (normal and italic) and orientations. Also deleting any line or string is readily accomplished by repeating the plot or chplot command with IPEN=2. The cross wire cursor facility is very useful for technical drawing programs, and the cursor can be made to blink by repetitive CURSOR commands. The manual provides details of the jump table for the extended BASIC commands, together with details of what needs to be stored in the accumulator and registers when the jump is made to ensure the correct action. Not all the BASIC commands are provided for by this jump table (the relative coordinate plotting commands are missing), but enough are available that a very acceptable result can be produced from machine code or compiled BASIC programs.

Not surprisingly there are a few niggles which should be mentioned. Probably the most unfortunate is that it is not possible to have the hi res display and the normal display on the screen at the same time. This is a regrettable oversight on Commodore's part, as anyone who has become familiar with Supersoft's hi res boards will appreciate the value of being able to display either or both images in a variety of situations. A consequence of this limitation arises immediately one starts experimenting with the hi res system. BASIC program breaks (or crashes) when in hi res display leave the hi res display on and the normal display off - so you cannot see any error messages on the screen, nor what you type on the keyboard. Normally pressing stop and typing DISPLAY(0) will restore the normal display and any error message that was produced; but naturally many program mishaps in this kind of system can occur at points where the stop key is ineffective, and in such cases the only remedy is a cold restart.

A second niggle concerns the choice of the display resolution. 512\*256 may be a convenient pair of numbers for the software to handle, but it is not a good choice of resolution for a display that is square (the hi res display in fact has large left and right margins, so that the area available for plotting is precisely square). The result is that drawn objects have twice the step size in the y (vertical) direction as in the x direction. Furthermore unless one always works in mathematical space rather than the faster pixel space, the physical length of a line depends on which direction it is drawn. Again the Supersoft boards seem to have a logical advantage (although a lower resolution).

The remaining niggles are admittedly less important. I found the hi res system surprisingly slow under BASIC control, taking for example, more

than a second to draw a circle with the ICRCCL command. I found the difficulty of displaying and removing text from the hi res screen irritating in that it makes the job of programming prompts and messages considerably more time consuming. I found the manual's comments on machine code programming for the hi res system virtually useless.

Having said that, I still like the 8296 hi res system. The hi res display is very clear and it is very useful to be able to display text in a variety of sizes (which is not possible on the Supersoft boards), particularly on technical drawings. The resolution of the display is adequate for most of our applications (viewing spectra and technical diagrams) and a noticeable improvement over the Supersoft system. A photograph of a typical display on the hi res screen (produced by the program DRAWPET) is shown below.

The D part of the 8296 GD is the integral dual disk drive. These are the same drives as those in the half-height 8250 and the SFD 1001, and each formatted disk holds just over a megabyte. (One reviewer thought the disks were single sided and held only half a megabyte each.) These drives can read from and write to disks formatted on a (single sided) 8050 drive, although in this case the first access to the disk after insertion into the drive causes an "illegal track or sector" error. Subsequent accesses work correctly with some exceptions (eg you cannot backup from a single sided disk). The drives each have a short lever protruding from the front of the housing and this is used to lock the head mechanism onto the disk. The only item of the documentation which was specifically related to these drives (four of the manuals/addenda on disk drives did not refer to these new drive units) warned that the locking lever needed teasing to ensure correct seating of the disk (just as the early Tandon drives fitted in 8050s and the Micropolis drives fitted in the full height 8250). However, I have never found this to make the slightest difference with the Micropolis drives, and as far as I can tell, it makes no difference with the 8296 drives either. They appear to be reliable and program loading is considerably faster than it was on the older drives - a 30k program loading in approximately 16 seconds.

Inside the 8296 the main circuit board is quite different from the old 8000 series board. It's smaller and has far fewer chips. Although I have not tried to plug in any additional boards which mate to several sockets, I would be surprised if such boards as the Supersoft HR boards would fit the new layout. The normal pair of ROM sockets for \$9000 and \$A000 are present, although in this model they are occupied by the hi res software. The external connectors (IEEE, user port and cassette ports) are wired exactly as on earlier 8000 series machines, but a number of the connectors inside the machine have been significantly altered. J4 (the memory expansion connector), J8 (the power supply connector) and J10 (the power supply for hardware expansion) all have

substantial wiring changes. J4, because of the different address decoding adopted in the machine with larger RAM chips, has lost a number of the block select signals present in earlier machines, so interfacing systems which rely on these signals could have some difficulty. The two power carrying connectors have rather fundamental changes involving the presence of ac voltages on pins which on earlier models carried dc or were grounded. Fortunately the size of J8 has changed, and the key position of J10 has been altered, so the fact that changes have occurred is moderately apparent. However, the unregulated dc voltages which were available at these connectors are not present in the new system, so interfacing units which drew their power from one of these sources will require some attention before connection to this newest PET.

Turning to the minor aspects of the system, the keyboard of my machine was a different colour from the traditional Commodore, and had black letters on grey/brown keys rather than white letters on black keys. If anything, the keyboard feels slightly firmer than that of our 8032s and 8096s and it is very comfortable to use. The casings of the keyboard and computer are very similar to those of the earlier SK models, although the surface finish is a good deal smoother (making it easier to rest one hands on the edge of the casing while typing). The cable connecting the keyboard to the main unit is less elasticated than it was on the 8096-SK, so it becomes easier to move the keyboard some distance to the left of the computer. Being less elasticated the cable does not return to it storage size once stretched (like mine), but it is more important to have a comfortable typing position than a smart springy cable. The position of the screen is much easier to adjust in both orientations than was the case with the earlier SK models, as the monitor now rotates smoothly over the base unit. Finally the 8296 has at last ended the PET tradition of having no reset button. There is a small red button just above the cassette port which can initiate a cold restart (and an IFC on the IEEE bus). I suppose it would have been going to far to provide a warm reset button, but at least the new facility should provide some relief for the overworked on-off switch and the power supply components.

I must confess to being surprised that Commodore should have introduced another PET, and I would be amazed if any further models were to be produced. Many people now criticise the PET as being old technology, and I have no doubt that within the next few months Commodore's new "serious" machines will be making an appearance and PET production will decline, so closing a chapter of the history of microcomputers. However, one of the delights of the PET has been that most of what we learned on the early machines (such as using the ROM routines from machine code) has still been applicable in using the later models. All of the devices which we bought or made to plug in to the user port or IEEE bus on our 2000, 3000, 4000 and 8000 series PETs are still totally compatible with this latest version. For us these factors have meant

that we have learned much about how to use the machines, and how to quickly adapt a system for a new function. In short it has not been the newness of the machine's specification which has been important, but rather the availability of information which we could use to fit the machine to our particular applications. As the PET series has grown the specification has improved, but much more importantly, our familiarity with the system has grown and we have been able to make use of the enhanced specifications without having to suffer the delay of learning about a totally new machine. The 8296 GD has improved the specification again and is unquestionably the best PET yet. I wish it well.

Table 2: 8296 graphic BASIC extensions

command	function
INIT	initialise hi res system
CSCR	clear hi res screen
DISPLAY(I)	set display mode: 0=normal, 1=hi res
MODE(I)	listed in manual but not defined!
MAP(X0,XM,Y0,YM)	defines mathematical coordinates range X0 - XM etc.
PSPACE(X1,X2,Y1,Y2)	set window with X1,Y1 as lower left, and X2,Y2 as upper right of window
PLOT(X,Y,IPEN)	plot from current position to X,Y for IPEN result is 0 move ("pen up") 1 draw line ("pen down") 2 erase line 3 invert line
DPLOT(DX,DY,IPEN)	plot uses mathematical coordinate. similar to plot but uses relative coordinates DX,DY in math system
IPLLOT(X,Y,IPEN)	similar to plot but uses physical coordinate system (pixel numbers)
IDPLOT(DX,DY,IPEN)	similar to dplot in physical system
LINTYP(ITYP)	defines type of line in plot commands ITYP line type 0 continuous line 1 dotted line 2 dashed line 3 dot-dash line
ICRCL(R,CPEN)	ITYP should be 0 before erasing. draws a circle centred at the current coords, radius R (physical coords). CPEN=1 for draw, 0 for erase.
ARCUS(RX,RY,WA,WE,CPEN)	for circles, ellipses and arcs. RX & RY are axis lengths (mathematical), WA & WE are start and end angles (in radians). CPEN as above.

CHPLOT(A\$,IPEN)	display string A\$ at current coords. IPEN as plot.
CHRORI (IDIR)	character orientation and font
	IDIR                    orientation    font
	0                      horizontal    upright
	1                      "            "            italic
	2                      vertical     upright
	3                      "            "            italic
CHRSIZ(XS,YS)	defines character size in x and y. size in pixels is 6*XS, 8*YS
HCOPIY	creates hard copy on 8023P printer.
TSTB(A)	test graphics RAM byte by byte. A returns current byte
TSTP(P)	test current pixel set (return P=-1) or cleared (returns P=0).
CURSOR	inverts a cross wire cursor at the current coords.

---

LISTING 1 : part of wordpet memory management routines for 8296

(makro assembler, macros not listed)

```

1 *      = $7c00                26      sta $fff0
2 memmap = 660                 27      rts
3 tmpa   = 661                 28 !
4 tmpps  = 662                 29 ! store vectors in block
5 memk   = 663                 30 minit sta $fff0
6 caf    = 664                 31      lda f<irq ! irq vec
7 lspnt  = $66                 32      sta $fffe
8 lstmp  = $68                 33      lda f>irq
9 lstart = 665                 34      sta $ffff
10 lstop = 667                 35      lda f<nmi ! nmi vec
11 !                                     36      sta $fffa
12 macro @dpsta *****          37      lda f>nmi
13 ! double byte @1 to @2       38      sta $ffffb
14 !                                     39      jmp retn
15 ! set up interrupt vectors    40 !
16 begin sei ! disable irq      41 ! handle irq from ram
17      lda f$80 !enable 0&2    42 irq  sta tmpa
18      sta memmap             43      pla
19      jsr minit              44      pha
20      lda f$8c !enable 1&3    45      sta tmpps !status
21      sta memmap             46      lda f0 !disable ram
22      jsr minit              47      sta $fff0
23      cli                    48 ! push user return address
24 retn  lda f0 !normal exit     49      lda f>rtip
25      sta memmap             50      pha

```



## AN OFFER YOU CAN (AND SHOULD) REFUSE

by Will Light

I, and I expect all the other regional organisers, have just received a special offer from a firm called Associated Computer Marketing Limited of Aldershot. They are offering a 20% reduction for all club members off their 'NEW Disk Doubler'.

Sounds OK so far, doesn't it? But wait, what is this miracle gadget which 'pays for itself after "doubling" ten floppies'? It is nothing more than a small metal punch which produces an extra write-protect notch on the 'wrong' side of your floppy disk, thus enabling you to use both sides of the disk and cut your disk costs in half.

A bit pricey even at the reduced price of £12, but worth it for the long-term savings would you think? WRONG!

This is a the most pernicious and dangerous gizmo to appear for a long time. Single-sided disks are selected from the manufacturer's stocks by being rejected as double-sided ones. This means that there is likely to be some damage or imperfection on the wrong side. But there is worse to come! Double sided disk drives have two heads which read each side of the disk as it revolves always in the same direction. Inside the black square 'envelope' there is a layer of a Kleenex-type material whose job it is to sweep up all the dust, fluff and grit which might otherwise get trapped between the disk surface and the head, damaging both. If you turn the disk over, using the wonderful 'Disk Doubler', the disk rotates the other way, and all the aforementioned nasty stuff comes flying out, scratching the disk surface at best, and wrecking your expensive disk heads at worst.

I have seen the evidence for this just recently, a friend succeeded in doing the trick, with a pair of scissors - not a special punch, and then was surprised when none of his programs would load, and the disk surface looked like the grooves on a record! He also had to spend more than £40 having his drive overhauled because of head damage. . . .

Disks are only about £1.50 each from the club's discount scheme, so it is really a false economy to try to cut costs in this way. You have been warned!

--oOo--

## REVIEW - 'PROGRAMMING THE 64'

by RC West. pp 610+. 14.90 from: Biblios Ltd, Star Rd, Partridge Green, Horsham, W.Sussex RH13 8LD.

This book provides a comprehensive reference text for people wanting queries answered quickly and accurately and also claims to teach competent programming on the 64.

Basic and machine-language are explained in sequence from easy to complex and this process culminates in a chapter on mixing basic with ML.

There are in-depth examinations of major topics such as sound, graphics, tape etc. and many practical program listings are shown to help the reader understand how to program on the above topics efficiently and painlessly.

Questions answered include:

How are basic programs planned and written?

How can tape programs be moved to disk?

How can music be played while a program is run?

How to program the function keys, and many more?

The first chapter is an overview of the rest of the book.

Ch 2. Getting to know the 64 includes a description of the features, sockets, ports, etc. of the 64.

Ch 3. Basic reference guide is the section that most beginners are waiting for. It aims to give readers a good appreciation of the BASIC language and has a very instructive section on SYNTAX and its importance. There is an alphabetic list of KEYWORDS, all of which are comprehensively and lucidly explained to the reader, plus a list of ERROR MESSAGES.

Typical of the useful information to be found is the following:

LOADING BASIC

POKE 43,LO:POKE 44,HI:POKEHI\*256+LO,0:NEW followed by LOAD

This can put basic anywhere you choose if there is room for it.

Ch 4. Effective programming in basic deals with design, structure and faster basic, as well as debugging, array handling and matrix arithmetic, etc.



### Ch 5. 64 architecture.

This chapter deals with, amongst other topics, programming the CIA's and program recovery after a crash.

Detailed memory maps and diagrams of the various ports and CIA,CIA#1 and CIA#2 and a user-port tone generator + simple amplifier are given and bits, bytes, binary and hex are explained in detail.

### Ch 6. Beyond 64 BASIC

Explains all the usual advanced BASIC methods, e.g. how BASIC is stored in memory, special features and an alpha list of extensions to BASIC. There are also notes on BASIC-Enhancing utility programs.

### Ch 7. Starting 6510 machine-language

A beginner's guide to machine language. An ML monitor is essential and Supermon is listed in the Appendix (this can be obtained free from ICPUG library).

### Ch 8. ML methods specific to the 64

Shows how to program with the 64 basic ROM routines as well as Kemal routines and how to access the RAM under the ROM, using wedges into BASIC and how to change RAM vectored commands as well as using interrupts.

### Ch 9. Mixing BASIC with ML programs

This chapter explains how ML programs and data can be incorporated into BASIC programs and used successfully.

### Ch 10. lists the OPCODES in detail and

### Ch 11. 64 ROM GUIDE

lists the important first few hundred RAM locations and alternative memory options of the 64 and also the BASIC ROM and KERNAL ROM locations.

### Ch 12. GRAPHICS

Everything you need to know from using the simple inbuilt graphic set to the more complex full-screen graphics and motion.

The example programs will repay close study of how they work; they are good.

### Ch 13. SOUND and MUSIC

Explains the theory of sound and music in a practical way and

demonstrates with the aid of the sample programs how the SID chip handles both in practice.

#### Ch 14. TAPE

All one needs to know about tape handling from program and data storage and retrieval to hardware and security methods.

Ch 15. repeats the above for disk users.

#### Ch 16. GAMES PORTS

A short chapter on programming those devices (e.g. joysticks) which control the games ports. Fast ML routines are supplied.

#### Ch 17. PRINTERS, PLOTTERS and MODEMS

Example programs are given for each and in-depth analysis is carried out as well.

A number of appendices are supplied, of which I think the most interesting is on interconverting programs for the 64, VIC 20, PET and CBM.

#### In summary

If it is at all possible to summarise such a giant undertaking, this book is required reading for all those who wish to make full use of their 64s.

Of Ray West's previous books (Programming the PET/CBM and Programming the VIC) this is the best of all and those ICPUG members who have used either of the other books will need no further recommendation from me. To the rest of you I say, buy it!

Jack Cohen  
18.3.85

[As a 'stop press', Ray West tells us that the many programs given in the book will be available on two tapes (£9.90 + 50p postage) or one disk (£8.90 + 50p postage), also from Biblios - Ed.]

--oOo--

#### ARROW TURBO-BREAKER - REDUCED PRICE

Arrow Micro Services are making a special offer to ICPUG members on the price of 'Turbo-Breaker' advertised opposite. For a limited period only, anyone quoting their current ICPUG membership number when ordering Turbo-Breaker will have to pay only £10.00, instead of the advertised price of £10.95. So don't forget, when responding to advertisers, mention ICPUG; you know it makes sense.

HGV

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## SUPERBASE CORNER

edited by Hugh de Glanville

This month the corner is shorter than before, as Brian Leighfield's contribution has not made it in time for press. He has moved on to other activities than being PS's customer liaison man, in which position he has been replaced by Andrew McDonald, but he did say he hopes to continue contributing. However, there are some items of news.

The most interesting news is the development of Superbase version 2, with several useful new features, and a new all-singing, all-dancing (though still, I think, not very fast - an inherent problem) label program.

Perhaps the most useful new feature for many of us is the new 'export from "list" command, which will save all that fiddling around with 'Export to file' and its extra carriage returns needing to be trapped in an extra field on re-import. This, in operational convenience, is followed closely by a new utility that copies a database from disk to disk, or device to device, and removes the 'delete chain' at the same time; it will also rescue all good data from a corrupt database and allow one to start again with a clean database, without needing to export and import.

The database structure has also been changed so that the FULL DISK lockout does not occur. Blocks have been reserved to allow the FULL DISK message to be given before that situation has actually been reached.

Finally, there is a within-Superbase record and file deletion routine, menu-supported, and loading of file definitions, programs, etc. has been speeded up (not that we had noticed these functions to be particularly slow).

Note that once you have converted a database to version 2 Superbase, you can't go back again: V2 is not downwards compatible.

One reader thinks that the price of £28.75 asked for this update is iniquitous, but I cannot say I agree with him. At the price at which Superbase is available for the 64, one can hardly expect major updates free. On the other hand PS has started a business users' service which for £50 a year supplies all updates, presumably including this one, as well as applications and other support. To my mind this is very reasonable, unlike another well known software company which asks for what I feel is an excessive £100 for updates and any hot-line support at all; perhaps this amount is reasonable for support of a hard-disk



```

130 rem above sets string at max (255)
200 data 160,2,177,42,153,134,0,200,192,6
210 data 208,246,162,1,32,198,255
220 data 32,228,255,201,13,240,15,164,139,145
230 data 137,200,132,139,196,136,240,4,165,150,240,234,76,204,255
250 forj=896to937:readx:pokej,x:t=t+x:nextj
260 ift<>6108thenstop
400 open 1,8,3,"file"
410 rem: next sys same as 'input#1,a$'
415 rem: poke 909 for different channel number
420 sys896
425 rem: l= size of input (could be 0)
430 l=peek(139)
440 print left$(a$,l)
450 if st=0 goto 420
460 close 1
470 end

```

The following changes are needed for the C-64 :

```

70 ' ** string thing (c-64) **
200 data 160,2,177,45,153,137,0,200,192,6
220 data 32,228,255,201,13,240,15,164,142,145
230 data 140,200,132,142,196,139,240,4,165,144,240,234,76,204,255
260 ift<>6120thenstop
430 l=peek(142)

```

For use as an archiving routine, it merely needs the addition of statements to OPEN the archive file, PRINT the required data and CLOSE the file.

The following lines should be added :

```

405 open 2,1,1,"s-base archive":rem ** tape file for writing
445 print#2,left$(a$,l);chr$(13);
460 close 2

```

Additionally, two lines should be altered to maintain use of the correct status byte:

```

420 sys896:rs=st:rem ** save disk status
450 if rs=0 goto 420

```

## SEARCHING QUESTIONS

by Alistair Kelman

The argument between privacy and property rights was won by the latter some time ago in Parliament and in the civil courts. Several times a month lawyers secretly obtain Court Orders that require a defendant to permit a solicitor to enter his home or office and search for materials that might infringe a plaintiff's copyrights or constitute unfair competition. These orders are sometimes used in the computer industry, the most well known case being the litigation between Digital Equipment Corporation and Darkcrest in which DEC sought and obtained one of these special orders alleging piracy of systems software by Darkcrest. However, there have been a number of court decisions that have limited the use of the special order.

For a number of years the civil courts have had to cope with a complex tactical problem concerning dishonest defendants. Normal court proceedings allow defendants time to make their case in opposition. When an action is started a writ is served on the defendant, he enters an appearance on the court record, puts in a defence and has the case argued in court by counsel. In cases of copyright infringement, however, it is possible for a dishonest defendant to pass all his illicit copies to a friend and perjure himself in court stating that the only illegal copies he might have had are those in the possession of the plaintiff. The court has to decide without sufficient evidence and the defendant is given the benefit of the doubt. He can then get his illicit copies back from his friend and go back into business.

Nine years ago, to stop such injustice, the judges in the Chancery Division of the High Court started to make a special Court Order at the plaintiff's application *in camera*. This order, known by lawyers as the Anton Piller Order, after the first case that went to appeal, is served on the defendant without prior notice and orders him to permit the solicitor to enter his home or office and search for material that might infringe the plaintiff's copyrights or constitute confidential information. Failure to comply with an Anton Piller Order is a contempt of court rendering the defendant liable to imprisonment.

Although the order has been used by the computer industry, its main user is the music and record industry. Through their trade body, the British Phonographic Industry Limited, record companies use the order to stop piracy and bootlegging. Piracy is the unauthorised copying of records and tapes: bootlegging is the making of unofficial recordings

of performances of groups for the purposes of trade. Both are illegal under the Copyright Act 1956 and the Dramatic and Musical Performers Protection Act 1958 respectively.

Law goes in fashions and about four years ago the Anton Piller Order was a very popular procedure, with barristers applying to the courts for such orders in numerous cases. The judges in the early Anton Piller cases had said that it was 'an unusual order which will only be made in unusual circumstances', but barristers conveniently ignored this restriction and more and more of them decided to have a go at getting one. Within three years, almost every day the High Court in the Strand was granting two or three Anton Piller Orders in cases involving infringement of copyright, passing off, and even breach of a contract to pay commission to a relative.

The way the Order was used can best be illustrated by an example. In 1979 an Anton Piller Order was obtained against a 17-year-old alleged bootlegger called Ian Cunningham. This led to an orange-haired defendant appearing before Mr Justice Whitford in the High Court. The defendant, Terry Piggott-Simms, had a passion for rock-and-roll and hi-fi equipment. Over the years he had built up a collection of tape recordings which he had either recorded himself from broadcasts put out by the BBC or had copied from original tapes made by other collectors in the USA, France and Germany. Some of his recordings, found in the possession of Cunningham, caused the BPI to seek and obtain another Anton Piller Order, this time against Mr Piggott-Simms. One morning a solicitor turned up on his doorstep, showed him the order, entered his home and removed 447 tapes from his collection together with a number of letters and a card index.

Mr Piggott-Simms obtained legal aid and was properly represented in court at the subsequent hearing. The BPI through their counsel contended that his activities constituted an actionable wrong and that he had infringed the Performers Protection Acts by making tapes of live broadcasts for the purposes of trading with others by way of barter. The judge agreed with that submission as a point of law. However he closely questioned the defendant and was impressed by his sincerity, musical knowledge and technical ability. Many of the recordings he had made were of high enough quality to be capable of being used as master tapes for making recordings and many of his recordings had never been released by the record companies as discs. The judge came to the conclusion on the evidence that he was only effecting private exchanges to build up his collection and that he had no commercial motive. Mr Piggott-Simms undertook not to copy or barter his tapes but merely to



use them for private and domestic purposes as allowed under the Acts.

The BPI then made a further application. They wished to erase all 447 of Mr Piggott-Sims' tapes prior to returning them to him. The judge refused this request and stated that he had questioned Mr Piggott-Simms who had given a binding undertaking to the Court and that his own private pleasures would not interfere with the BPI's rights.

Seven months later Mr Justice Whitford's order had not been complied with by the BPI. They first said that they were holding the tapes pending an appeal. Then they produced a letter from the Mechanical Copyright Protection Society stating that if they did pass the tapes back to Mr Piggott-Simms the MCPS would consider that the BPI was liable in conversion to the MCPS.

There the matter rested until a freelance journalist doing research into the workings of Anton Piller orders found a reference to the Piggott-Simms case in an obscure series of law reports. He read Mr Justice Whitford's judgement and contacted Mr Piggott-Simms's solicitors to discover what had happened after the trial. Upon learning of the situation the journalist wrote an article about the case which was accepted for publication by the Guardian newspaper as a special feature. The draft article, after stating the facts, made the following correct statement of the law:

'Complying with an order of the High Court is a full defence in any civil action and failure to comply with an order is a contempt of court.'

The article then continued:

"It appears to be the case that the remedy of the Anton Piller order is being misused by the BPI who are infringing privacy and are ignoring a court order that they do not like. The music industry deserves protection from unfair competition but not at the expense of the rights of the honest citizen. . . . Mr Piggott-Sims is still waiting for his tapes, his legal aid having run out. Will someone please tell this to the judge next time the BPI applies for an Anton Piller order."

A copy of the article in draft was sent to the BPI 48 hours before it was due for publication and, following urgent telephone calls the day before it was to appear, the BPI agreed to give Mr Piggott-Simms his tapes back and the Guardian decided to 'spike' the journalist's article.

The tide was turning against the Anton Piller Order but the change in legal fashion came about with a decision by the House of Lords which found that the Anton Piller order procedure could not be reconciled

with the principle in the British Constitution that search warrants cannot be obtained merely for the purpose of discovering incriminating material. Overnight the Anton Piller order was dead. The copyright industries, horrified at their loss, began an immediate and concerted lobby of Parliament that resulted in a late amendment to the Supreme Court Act 1981 that brought the order back to life.

Something had changed, however, and the statements that the order should only be granted in extreme cases began to hit home. Experienced barristers today treat the order with the gravity that it deserves and it is thus only sought very occasionally. Additionally, if an order has been wrongfully obtained, the plaintiff can be liable to pay the defendant damages and judges have in recent times indicated that they might order such payment. Nevertheless schoolchildren swapping computer software with their friends should remember the fate of Terry Piggott-Simms and the fact that the computer games software manufacturers have recently banded themselves together into an industry-wide organisation, the Federation Against Software Theft, which intends, amongst other things, to fight software piracy by means of civil litigation against those they consider to be pirates.

--oOo--

## 6522 CHIP MASK CHANGE

I often get asked for information on using the 6522 VIA chip and when I was editor never had time to put together an article. Since the 6522 is perhaps as complicated to program as the 6502 processor itself, such an article is not to be undertaken lightly. Until such time as it comes to fruition, I draw your attention to a mask revision which affects the shift register logic. Rockwell part R6522-11, or earlier, had a design deficiency in the shift register mode (010) - shift in under control of phase 2 - in that the CB1 clock output pin would generate nine shift pulses instead of eight. The mask revision (R6522-31 or later) corrects this.

I can supply a data sheet on this complex chip for those of you that are technically inclined and wish to delve into programming the device. Additionally some data sheets for the 6551 ACIA chip can be supplied. Numbers are limited and will be dealt with on a first come, first served basis on receipt of an A4 sized stamped self-addressed envelope.

Ron Geere

--oOo--

# UPGRADING AND CUSTOMISING THE 64 KERNAL ROM

by Dr RL Nowill (North Gloucester ICPUG Branch)

A recent article in the ICPUG Magazine (Vol 6, No.2 March 1984 p109) detailed various changes that may be made to the V2 Kernal ROM. These changes are implemented by moving the contents of the ROM to the overlaid RAM, from E000 to FFFF. The various checks that CBM-64 owners may use to test whether a machine has old (V2) or new (V3) ROMs were detailed in the article.

It is preferable to burn a new EPROM than to transfer the ROM contents to RAM since the new Kernal will be available from switch-on. In the process of incorporating an EPROM one may also include personalised power-up messages, select new default fore/background colours and any other revisions as they are documented.

The hardware problems associated with replacing the ROM are two-fold:

1. Some (but not all) CBM 64s have the Kernal ROM hardwired into the PCB (the IC is at position U4). In this case, the first operation is to unsolder the device and to put a 24-pin IC holder in the vacant space. Check the operation by powering up with the old ROM. (Note that this operation may well invalidate the warranty.)

Suitable EPROMs (2764 series) have 28 pins, not 24 like the ROM. Hence an adaptor must be constructed as follows:

2364 24 pin ROM socket	2764 28 pin EPROM holder	Function of pin
1 connect to	3	A7
2	4	A6
3	5	A5
4	6	A4
5	7	A3
6	8	A2
7	9	A1
8	10	A0
9	11	D0
10	12	D1
11	13	D2

12	14,22	Ground, Output Enable
-----		
13	15	D3
14	16	D4
15	17	D5
16	18	D6
17	19	D7
18	23	A11
19	21	A10
20	20	Chip Enable
21	2	A12
22	24	A9
23	25	A8
24	28,27,1	Vcc, Program
	26	No connection

A 28-pin IC holder, and a 24-pin IC chip adaptor (simply like a 24-pin plug with tags that fits a 24-pin holder) together with some tinned copper wire make a very compact adaptor when 'piggy backed'. Many of the pin-pin connections mate up exactly and only a few flying leads are necessary. A PCB version has also been engineered by the author.

The software changes may be summarised as follows. All the remaining V2 data should be transferred unaltered when blowing the new EPROM.

Existing 2364 ROM address	Free standing 2764 address	'Old' data	'New' data	Function & Comments
EF8A	0F8A	A9	4C	RS 232 fix (see ICPUG) (Vol 6 No. 2 p109)
B	B	A9	D3	
C	C	02	E4	
E4D3	04D3	AA	85	
4	4	AA	A9	
5	5	AA	A9	
6	6	AA	01	
7	7	AA	85	
8	8	AA	AB	
9	9	AA	60	
E4DA	04DA	AD	AD	Screen clear fix

B	B	21	86
C	C	D0	02
EA07	0A07	A9	20
8	8	20	DA
9	9	91	E4
A	A	D1	A9
B	B	20	20
C	C	DA	91
D	D	E4	D1
E	E	EA	88
F	F	88	10
10	10	10	F6
11	11	F5	60
12	12	60	EA
E622	0622	ED	92
3	3	E6	E5
E57C	057C	B5	20
D	D	D9	F0
E	E	29	E9
F	F	03	A9
80	80	0D	27
1	1	88	E8
2	2	02	B4
3	3	85	D9
4	4	D2	30
5	5	BD	06
6	6	F0	18
7	7	EC	69
8	8	85	28
9	9	D1	E8
A	A	A9	10
B	B	27	F6
C	C	E8	85
D	D	B4	D5
E	E	D9	4C
F	F	30	24
90	90	06	EA
1	1	18	EA
2	2	69	E4
3	3	28	C9

4	4	E8	f0
5	5	10	03
6	6	F6	4C
7	7	85	ED
8	8	D5	E6
9	9	60	60
A	A	20	EA

E4AC	04AC	92	5C	Checksum change
FF80	1F80	00	03	

E47D	047D	20	Power-up sign-on message (may be altered to suit the user, eg: company name etc)	
E	E	C	43	
F	F	O	4F	
80	80	M	4D	

1	1	M	4D
2	2	O	4F
3	3	D	44
4	4	O	4F
5	5	R	52
6	6	E	45
7	7		20
8	8	6	36
9	9	4	34
A	A		20
B	B	B	42
C	C	A	41
D	D	S	53
E	E	I	49
F	F	C	43
90	90		20
1	1	V	56
2	2	2	32
3	3		20

56	56	This could be altered to read V3, not V2
33	33	

ECD9	0CD9	0E	0C	Screen colour (=grey)
A	A	06	0F	Background (=light grey)
E535	0535	0E	0B	Cursor

E591	0591	EA	E4	Not in the ICPUg list,
------	------	----	----	------------------------

2	2	E4	C9	but a change by CBM for
3	3	C9	F0	V3
4	4	F0	03	
5	5	03	4C	
6	6	40	ED	
7	7	ED	E6	
8	8	E6	60	
9	9	60	EA	
A	A	EA	20	
E622	0622	ED	91	ICPUG suggested 92 here: CBM go for 91
EF94	0F94	85	40	
5	5	A9	D3	
6	6	60	E4	

The only remaining problem before a new EPROM may be blown is borrowing a PROM programmer. Some very cheap models are on the market for CBM-64s, and some component suppliers (eg: Farnell) offer a quick service for a modest fee.

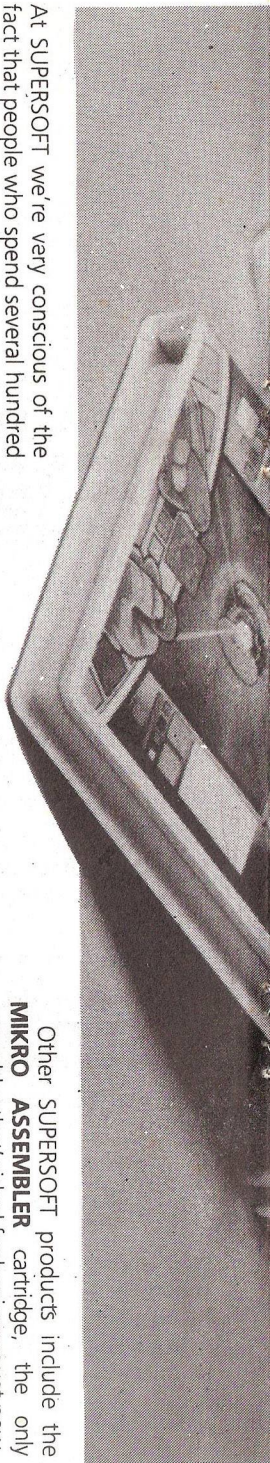
A final note of caution. Two types of EPROM are available, the -P series which are plastic and cheap, or the -D series, which are ceramic and more expensive. Only the -D series are UV erasable, however, and in the long run for prototyping are generally much more cost-effective.

[ Dr. Nowill sent an example of a neat adaptor constructed as described in his article and a very fine PCB version of the same idea. At one time he proposed to market the holder and offer an EPROM customising service but 'never got round to it' - Ed]

--oOo--

## THE GREAT COMPENDIUM

Peter Reynolds writes that preparing the N/letter Compendium will be a big job and he would like to hear from volunteers prepared to check parts of the text for accuracy and to suggest indexing references. Please write indicating your areas of expertise and interest and whether and in which format you can read Superscript or Wordcraft files. His address is: 65 Claremont Road, Tunbridge Wells, Kent TN1 1TE: tel. (0892) 26016.



At SUPERSOFT we're very conscious of the fact that people who spend several hundred pounds on computer equipment are looking to do rather more than play Space Invaders.

Financial planning is a rather grand name for something you've been doing all your life — making ends meet! Perhaps if Mr Micawber had used **BUSICALC** he would have been able to balance the books a little better.

For home, club or small business use **BUSICALC 1** should pay for itself in no time at all; for larger companies we recommend **BUSICALC 3**, one of the few really valuable programs that you can learn to use in a day.

Although your Commodore 64 is a powerful musical instrument you need to be a pretty good programmer to understand how it all works. Unless, of course, you buy **MUSIC MASTER!**

To use **MUSIC MASTER** requires no prior musical knowledge, though in the hands of an experienced musician it will prove an invaluable tool. You don't need to know the first thing about programming either! **MUSIC MASTER** is the musical equivalent of a word processor, remembering the notes you play and allowing you to replay and edit them as you wish.

**INTERDICTOR PILOT** is a space flight simulator. Nowadays simulators are widely used to train pilots and astronauts because — to be frank — it's a lot cheaper (and safer) than the real thing!

Imagine, if you will, life in the 22nd century: space travel is commonplace, and on the outskirts of the galaxy the first war between civilizations is being fought. A shortage of trained pilots has prompted the Federation to develop a computer simulation that allows raw recruits to gain experience without paying for their mistakes with their lives. With the aid of your Commodore 64 you too can learn to pilot the Interdictor Mk 3 craft. But be warned — this is no game!

Other SUPERSOFT products include the **MIKRO ASSEMBLER** cartridge, the only assembler that's ideal for beginners yet powerful enough for the professional (most of our competitors use it!). The **VICTREE** cartridge adds dozens of commands to Basic including toolkit aids and disk commands; or on disk there's **MASTER 64**, a really comprehensive package for the keen programmer.

Of course, we do also publish games programs, and with classics like **STIX**, **QUINX** and **KAMI-KAZE** in our range we are one of the market leaders. But we most enjoy coming up with the sort of programs that are going to be in use for months and years, not hours and days — the sort of programs that make you glad that you bought a computer — and glad that you bought SUPERSOFT!

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## FURTHER MEANDERINGS

by Mike Todd

A couple of members have written saying they liked my last meandering column, so I thought, in view of the problems I've had to find time for ICPUG work recently and the fact that we are trying to turn round this newsletter as quickly as possible, I'd do another.

I'm often asked what I use as a word-processor package. Many assume that it must be either EasyScript or SuperScript but in fact I use Wordcraft. I first started using this on my 3032, with 3040 disk drive, many years ago - soon after it first came out.

Although I have SuperScript for the 710 and for the 64, in the last few weeks I have been using an 8296D (80 column, with built in 8250 disk drives) and this came with yet another SuperScript. Since I wanted to use the 8296D immediately, I decided that I would use SuperScript instead as it has had a reputation for being very versatile.

As someone who tries out many software packages, I consider myself fairly flexible in my approach to software, although I do have very strong views on what makes something 'user-friendly'. I persisted with SuperScript for three weeks and found I liked a couple of features it offered, but there is no way I could describe it as 'user-friendly'.

In the end, I gave up and went back to the 3032 and the ancient version of Wordcraft. Now I'm using the latest version (K) on the 8296D, and it is terrific. It does have the limitation of a maximum line length of 117 characters, but to be able to see and adjust the exact printed format on the screen is vital when preparing printed documents. I know SuperScript allows a preview of the printed page on the screen, but this can only be scrolled forwards and not backwards, it is also impossible to easily identify where SuperScript is going to put a new page break.

Wordcraft is very much faster to use, offers more facilities and versatility than SuperScript and is almost the ultimate WYSIWYG (pronounced wizzy-wig) program - what you see is what you get. The only exception is that it doesn't give right justification on the screen.

SuperScript was a fine wordprocessor program when it was first released as it was very cheap, but I feel that it is certainly not a work-horse program like Wordcraft. The need to read around the format control sequences and the difficulty in visualising the effects of changing format makes it cumbersome ... and I immediately worry about

any program which erases a complete line of text if I accidentally press the RETURN key!

I know many use it, and are very happy with it, but I don't like it.

Anyway, on to other things. I was musing the other day about the speed of the various Commodore disk drives having been using a BBC model B at work (not for computing I may add, but as a VT100 terminal emulator!). Its disks seemed incredibly fast, so I thought I would do a comparison timing between the different Commodore drives that I have.

The 8296D saved a 16k block to my 3040 in 37 seconds (about 430 bytes per second) while it took only 16 seconds to load it back again (1k bytes per second). The 3032 and 710 were slightly faster than this, each taking 33 seconds to save and 14 seconds to load the 16k block. This result was rather surprising in view of the fact that the 710 runs much faster than the 8296D or the 3032.

When it came to using the 8250 drive built into the 8296D, the rate was doubled - with the 16k block being read into the 8296D in only 8 seconds (2k bytes per second). The 3032 and 710 took about the same time to read from the 8250.

It is clear from this that the speed of data transfer is a function of the disk drive: the speed of the computer seems to be irrelevant.

I also checked the speed of the 1541 into the 64 - it took 47 seconds to save the 16k block and 42 seconds to load it back. A transfer rate of about 350 bytes per second.

Despite its awful BASIC (yes, I said awful!), unpleasant keyboard, and ugly appearance, the BBC model B is certainly much faster than any of these figures.

While on the subject of disk drives, I might mention the 1542. The first drive of the series was the 1540, in the same white plastic as, and intended for use with, the VIC. A new version, the 1541, was then released - first of all in white, and then in grey/brown to match the 64. The 1542 was expected to come out in black to match the C16, but it has never been seen. The 1542 was never intended to be a high speed 1541, it was simply a new colour.

Anyway, it doesn't look as if we'll ever see a 1542 at all now.

In the USA, the 700 series is referred to as the 'B' series - with the 710 being known as the B-128 and the 256k version as the B-256. It is therefore interesting to note that several sources refer to the new Commodore-128 (which should be referred to as the C128) as the B128! I

guess they've misunderstood something somewhere.

When my 8296D was delivered, there was a triple-bundled software package supplied. I've already mentioned SuperScript, but it also included Calc-Result and the Manager.

Calc-Result was my first real encounter with a spreadsheet program and I spent many happy hours playing with it . . . what an amazing thing a spreadsheet is . . . if only I could think of a use for it!

I recently started using the EPSON portable PX-8, which comes complete with a very good BASIC (far better than BASIC 2), a word-processor (Wordstar), spreadsheet (CALC) and database (CardBox) program. It is a Z80 system running CP/M 2.2 (wash my mouth out with soap and water!) and has a readable 80x8 character liquid crystal display, and a very comfortable keyboard.

It comes with 64k of memory on board, with an optional 128k RAM disk pack. This is not as much as it seems at first, but still more than enough, especially as you lose nothing when you switch off.

Why do I use this? Why not wait for the Commodore LCD? Well, the Commodore LCD is a very long way away and I wouldn't like to guess when we'll see it in the UK.

The PX-8 can transfer any file down its RS232 interface, into the 710 and thence onto the 8250 - and the resulting ASCII file can be read straight into Wordcraft. Similarly, text created with Wordcraft can be saved as an ASCII file and read back into the PX-8 through the 710.

Now I can write ICPUG articles on the train on my way to work!

Fast disk copiers for the 64/1541 have been around for some time now. The problem is that the 64 can only hold about a third of the total data held on the disk, and therefore some disk swapping is inevitable.

I was impressed enough to have seen a backup program that formatted a disk in about 10 seconds and did the full copy in only 3 minutes - a couple of days ago I was shown a German program that copied the entire disk in only 90 seconds! That's faster than the 3040.

Finally, in view of a serious lack of spare time at present (most of which is currently taken up with trying to redecorate) I must apologise to all those who have had to wait for replies to their letters. I'm afraid I have only been able to sit down about once every three or four weeks to answer them.

--oOo--

## THE CURRAH 'SPEECH 64' SPEECH SYNTHESIZER

by Jim Kennedy

The Currah Speech 64 speech synthesiser allows your computer to talk to you. It works by generating allophones (basic sounds) which are strung together to make words and phrases which we recognize as speech. For example, the word 'oil' is composed of two allophones OY and L. The OY allophone is the one found in the words 'boy' and 'toy'. The L allophone sounds just like the last part of the word 'hell'. Well that's the theory: now for the practice.

The Currah Speech 64 cartridge plugs into both the Cartridge Expansion Slot and the Audio/Video Port of the C64. The sound comes through the RF Modulator Port (TV output connector). Using it is easy. Plug the Speech 64 in, turn on your C64 and type in INIT. Thereafter every time you type in a letter or number you will hear the TV set (or separate speaker if you have one but more on this later) respond with the name of the letter or number. If you type in 6 it says 'six', B gives 'bee', P gives 'pee', etc. If you press the RETURN key then it will say 'return'. To stop it pronouncing each key as it is input you can turn it off by typing KOFF. You can turn it back on again by typing KON 0 or KON 1. KON 0 gives a low voice (a male version of the R2D2 robot) and KON 1 gives a high voice (female R2D2 perhaps?).

But not many people want to hear each key as it is typed into a program. And that is not what a synthesiser is all about. What we really want is for the computer to say useful things like 'Good Morning, David' or 'Stop, You have pressed the wrong key' or 'Sorry, you just erased the entire database'. And that is what this unit does very well.

Now to operate Speech 64 in such a useful manner you simply use the SAY command. The SAY command can be used almost like the BASIC 'PRINT' command. If you want to see HELLO on the screen you type

```
10 PRINT 'HELLO'
```

Likewise, if you want to hear HELLO then you type

```
20 SAY 'HELLO'
```

Simple, isn't it? If you wanted to, you could make the next line

### 30 SAY "MY NAME IS SPEECH SIXTY FOUR"

If you ran a program with the above three lines you would see the word 'Hello' displayed on the screen and hear the words 'Hello. My name is Speech 64' spoken through the speaker. Admittedly, the voices do not sound human but they are clear and can be understood easily.

Now the English language has some diabolical pronunciations in its vocabulary. It is really too much to expect a speech synthesiser to know to pronounce the names BEAUCHAMP, BEACHAM and BEECHAM alike. Let's look at how Speech 64 copes with this kind of problem. It does it by giving you two choices. First, you can change the spelling of the word until the sound is to your liking. The instruction manual uses the word HAWAII as an example. You change the command to

```
SAY "HAWHY'EE"
```

This gives a better pronunciation. However, you may prefer to use a second method that uses allophones directly. You just use square brackets inside the SAY statement to tell the Speech 64 unit you are using allophones. A statement would look like

```
SAY "[haw(ii)(ee)]"
```

This is really just telling the unit to say 'haw' normally, then say (ii) as in the 'i' in 'hive' and (ee) as in the 'e' in 'sea' or 'see'. You can polish up the speech using this second method as much as you like. However, it should be remembered that most SAY statements will sound reasonable just as they stand. You will not have to use the allophone method very often unless you are a real pronunciation fanatic.

Just as one can choose KON 1 and KON 0 options so one can also choose which of the two voices you wish to use with the SAY command. Since 1 is the default voice you either use SAY or SAY 0 for the high and low voice respectively.

A 16-page manual comes with the unit and is clear and concise. I wish that other manuals for other products were as user friendly as this one is (Commodore, please take note). It explains how to use allophones in some detail, describes the speech buffer which can hold 256 allophones, gives some short BASIC programs to prevent buffer overflow, and covers three ways of using the unit with machine code. Three appendices are included which cover both decimal and hex codes for the allophones, a

sample BASIC program called The Speaking Clock, and a quick guide to the extra BASIC commands of this unit.

Possibly the only complaint a few people may have with Speech 64 is that it says 'zee' rather than 'zed' when the letter 'z' is typed while in the KON mode. I don't know whether this is inherent in the SP0256-AL2 speech processor chip or whether it was done by the designers to make the product more transportable to the North American market. (I believe that was the reason why Superbase defaults to the North American date form of MAR1385 rather than the British form of 13MAR85. See Superbase Corner p406 ICPUG Newsletter Vol 6 No6 if you want to know how to have your dates always in the British form.)

Speech 64 is currently manufactured by Dk'tronics in the UK. The price of the unit is advertised at £29.95. I believe it represents good value for money. Its own 8K of ROM contains the instruction set for Speech 64 so no additional software is needed.

As mentioned above Speech 64 can also be used with a monitor, but, with certain provisos. First, if you have a monochrome monitor which uses a phono plug input (like the TV output connector) then purchase a cable with a 5-pin DIN plug on one end and phono plugs on the other. You then can hook up one of those battery-powered speakers, such as are sold for Spectrum add-on sound interfaces, to the plug from DIN pin 3. The monitor should be run from the phono plug from DIN pin 4 (composite video). You will also need to make up a small box with two or three 5, 7 or 8-pin DIN sockets wired together in parallel. This will act as a junction box. You then run a DIN to DIN cable from the Audio/Video Port to this box. Then run the DIN to Phono cable from the box to the monochrome monitor and speaker as above. For a colour monitor the junction box must use 8-pin DIN sockets and you should run an 8 pin DIN to DIN cable to the monitor and you can use a 5-pin DIN to Phono cable to the speaker. (See the article by Mike Todd entitled 'The Video Connection' p56 ICPUG Newsletter Vol 7 No1 if you want to use a speaker with a monitor and are unsure about the Audio/Video Port on your 64 and how to connect everything up.)

--oOo--

# MICROMON 64

In the club's disc library you will find two copies of Micromon 64 originally published by "Compute" magazine. The number following the title is the load and execute address.

The commands available and some explanation is produced below. Please note that as this was produced on a conventional typewriter the "£" has been printed where a "#" should actually be used.

## COMMAND SUMMARY

<u>Micromon-64 Instruction</u>	<u>Command</u>
Assembler	A
Break Set	B
Compare Memory	C
Disassembler	D
Exit Micromon	E
Fill Memory	F
Go Run	G
Hunt Memory	H
Jump to Micromon Subroutine	J
Load Memory from Device	L
Memory Display	M
New Locator	N
Offset or Branch Calculate	O
Print Switcher	P
Quick Trace	Q
Register Display	R
Save Memory to Device	S
Transfer Memory	T
Verify Memory from Device	V
Walk Code	W
Exit to Basic	X
ASCII Conversion	"
Decimal Conversion	£
Hexadecimal Conversion	\$
Binary Conversion	%
Checksum Memory	&
Command End Tone Enable	(
Command End Tone Disable	)
Addition	+
Subtraction	-
Disc Directory	>
Modify Machine Code and Disassemble	,
Modify upto 8 Data Bytes in Hexadecimal	:
Modify Image Shown by Register Display	;



### SIMPLE ASSEMBLER

```
.A 2000 A9 12   LDA £$12 : any comments  
.A 2002 JMP $3000
```

Assembly is initialised by entering 'A' and the hex address followed by the instruction. The line is reprinted after 'return' as shown. The address and operand must be in hex, and the operand must be preceded by '\$' and by a '£' if immediate. The line is terminated by a ':' and comments can be added which should appear on hard copy. To exit the assemble 'return' after an address prompt.

### BREAK SET

```
.B 2076 0010
```

In the above example execution of code will break after the 16th occurrence of address 2076. If no count is specified then execution will break after the first occurrence of the address. Execution must be started by the Quick Trace command

### COMPARE MEMORY

```
.C 2000 2FFF C000
```

Example is compare block of memory 2000-2FFF with block starting at C000 and output locations in the first block that have mismatching data bytes in the second block. Compare can be stopped by 'run/stop' during output of mismatched addresses.

### DISASSEMBLER

```
.D 2000 2005  
., 2000 A9 12   LDA £$12  
., 2002 9D 00 80 STA $800C,X  
., 2005 AA      TAX
```

Disassembly starts at the first address and continues to the second address. If no second address is specified disassembly is of only the one line. The ',' is a hidden command and data bytes may be changed with the line being re-assembled after return. BEWARE cursor to the bottom of the screen afterwards as the next address is prompted and using 'return' could corrupt the code.

### EXIT MICROMON

.E exits micromon resetting IRQ and BRK vectors as well as the tape buffer before return to Basic. Use .E to exit before using normal Load, Save and Verify.

### FILL MEMORY

```
.F 2000 3000 FF fills memory from 2000 to 3000 with FF.
```

### GO RUN

.G 2000 starts execution of code from address 2000. Code should end with BRK to return to micromon. If no address is specified then execution starts at the address shown in the Program Counter of the Register Display.

## HUNT MEMORY

```
.H 1000 5000 'ASCII STRING  
.H 1000 5000 01 02 04 06
```

In the first example memory between the limits specified is searched for the ASCII String and all occurrences are printed. The second example is for bytes of data.

The search string can be upto 32 characters or bytes long.

## JUMP TO MICROMON SUBROUTINE

```
.J 3000
```

causes the subroutine at 3000 to be executed while in the micromon environment. The subroutine should end with an RTS.

## LOAD MEMORY FROM DEVICE

```
.L 4000 "FILE" 08
```

searches for data file FILE on device 8 and starts to load into memory at 4000. If no device is specified then the default is tape.

## MEMORY DISPLAY

```
.M F000  
.: F000 54 4F 4F 20 4D 41 4E 59 TOO MANY
```

The command displays eight bytes of memory and ASCII translation for either a single line or a specified block. The ':' is another hidden command and data bytes can be changed. The same warning applies as for the disassembler.

## NEW LOCATOR

```
.N 2000 2003 6000 C000 CFFF  
.N 2000 2003 6000 C000 CFFF W
```

The first example fixes all three byte instructions in the memory area \$2000-\$2003 by adding \$6000 to the absolute address in the two bytes following the opcode. Any absolute addresses outside the range \$C000-\$CFFF are not adjusted. The second example searches for two byte or word addresses and adjusts. If a bad opcode is found then the process is stopped with a disassembly and display of the bad opcode.

## OFFSET OR BRANCH CALCULATE

```
.O 1004 1000 FA
```

The offset is calculated from the first address (containing the branch opcode) to the second address.

## PRINT SWITCHER

```
.P
```

If output is to the screen switches output to RS232. If output is not to the screen, restores output to the screen leaving the RS232 active until the buffer is empty.

```
.P 0000
```

regardless of the output clears the RS232 channel and sets output to screen.

```
.P CCBB
```

If output is to screen sets CC to RS232 command register and BB to the control register

These only apply to RS232 output. If the Commodore printer is in use then the normal CMD instruction must be given in Basic before entering Micromon.

## QUICK TRACE

.Q 4000 execution starts at the specified address, not at full speed, until the Break set by the Break Set command is encountered. Run/Stop will break execution and display the register image saved. If no address is specified execution begins at the address in the program counter.

## REGISTER DISPLAY

```
.R
PC  IRQ  SR  AC  XR  YR  SP
; C04E C391 32 32 00 1C F7
```

The ';' is another hidden command and allows you to change the contents of the registers. Change the value and 'return'

## SAVE MEMORY TO DEVICE

```
.S 4000 5000 "FILE" 08
```

The command save memory from 4000 up to, but not including, 5000 to device 8. Again tape is the default.

## TRANSFER MEMORY

```
.T 4000 4FFF 6000
```

transfers a copy of the memory block 4000-4FFF to a block starting at 6000. Transfer begins at the high location of each block.

## VERIFY MEMORY FROM DEVICE

```
.V 4000 "FILE" 08
```

verifies against memory the data file on device 8. Tape again is the default and if no filename is specified the first file on the tape is verified.

## EXIT TO BASIC

```
.X
```

exits to basic leaving the Micromon IRQ and BRK vectors intact.

## CONVERSIONS

```
." B 42 66 0100 0010
.E 16706 4142 A B 0100 0001 0100 0010
.$ 4142 16706 A B 0100 0001 0100 0010
.% 0100000101000010 4142 16706 A B
```

## CHECKSUM MEMORY

```
.& C000 CFFF A500
```

The data in memory from C000-CFFF is byte summed and displayed.

## COMMAND END TONE

```
.(
```

enables the command end tone, which is generated at the end of execution of the next command. Saves watching the screen during, say, a long save.

```
.)
```

disables the tone.

## ADDITION & SUBTRACTION

```
.+ 1111 2222 3333
```

the two hex numbers input have the modulo-16 sum output.

```
.- 3333 1111 2222
```

subtraction by twos complement arithmetic.

## DISC DIRECTORY

.> will display the disc directory. Run/stop halts output while 'space' causes output to wait and a further 'space' restarts output.

## WALK CODE

```
.W  
.W 4000
```

The walk begins by machine registers to the values shown by the register display. A single instruction is executed, an IRQ generated, and the new machine image is displayed as SR, AC, XR, YR, SP followed by address and disassembly of the next instruction. Run/stop stops walking. Using 'J' at the start or during a subroutine causes execution of the subroutine at full speed. BEWARE the use of the 'J' in mainline code will cause unpredictable results. Execution either begins at the address in the PC or at the specified address.

## RELOCATING MICROMON

Micromon can be relocated using its own commands and seven other byte changes. The procedure is as follows:-

To transfer Micromon from C000-CFFF to 2000-2FFF

```
.T C000 CFFF 2000 copies the block of memory  
.- 2000 C000 calculates the difference which is 6000.  
.N 2000 2003 6000 C000 CFFF  
.N 2012 2E6D 6000 C000 CFFF  
.N 2FB5 2FFE 6000 C000 CFFF W
```

In addition the following seven bytes should be changed using the memory command.

Location	Old value	New value
2018	C5	25
202A	C3	23
2322	CF	2F
2392	CC	2C
2649	C5	25
2701	C5	25
28A7	C3	23

Well that's about it. I have found this to be about the best available for the C-64 and hope you will find it as useful as I have over the last few months.

--oOo--

(Reproduced by courtesy of the North Gloucestershire Group)

## UPCOMING COMPUTER EXHIBITIONS

by Jim Kennedy - Exhibitions Organiser

The dates of two computer exhibitions of interest to all ICPUG members have been tentatively announced. First is the 6th Commodore Computer Show. It is to be held at the Novotel Hotel, Shortlands, Hammersmith, London W6 on Friday 7th, Saturday 8th and Sunday 9th June 1985. It will be devoted entirely to the home and personal side of computing. Note the 'Open on Sunday' change which is designed to attract more families. Although Commodore have not yet announced what items they will have on display, many people expect that the new C128 will be shown. The C128 is sort of three computers in one. It will have a C64 mode which will run just like a current C64 using 64 software and hardware. It will have a C128 mode with a new version of BASIC (BASIC 7.0). In this mode the user will have a choice of 40 or 80 column display so facilitating its use as a word processor. Also in this mode it can address up to 512K using an external RAM disk. Finally, it has a third CP/M mode which is one of the main business software systems. This three mode design will insure that the C128 will have more software available upon its launch than almost any other machine has during its lifetime. Hopefully the LCD Portable Computer will also be on display. This machine, like the C128, is compatible with C64 peripherals as well as the new line of peripherals which CBM is bringing out.

The second show is the PCW Exhibition and is always a major event, not only for home and personal users, but for business users as well. The dates of this show have been announced as Wednesday 4th thru Sunday 8th September, again the Sunday opening allowing families good access. Being 7 months into the future (from the date of writing this blurb) less is known about what new items may be expected. One can speculate that if the other two new machines one hears that Commodore is developing (the 16 bit Commodore 900 and the Amiga Lorraine) are not to seen at the June Commodore Show, then the September PCW Show would be the obvious place for their appearance. Still, all of this is speculative. We must await future announcements from CBM.

At both shows your intrepid ICPUG National Committee will be present and proclaiming to all and sundry, the advantages of membership in our illustrious organisation. We hope to have acquired a new modular, transportable exhibition stand by June, finances and construction

schedules permitting. We shall need a few members to help out with the running of this new stand, particularly on Friday 7th June at the Commodore Show and Wednesday 4th thru Friday 6th September at the PCW Show. Offers concerning your willingness to help out on any of the dates involved to your Exhibitions Organiser, Jim Kennedy by post to 57 Gunnersbury Avenue, Ealing, London W5 4LP; by phone to 01-993-2634; by Prestel Mailbox systel 019932634; or Compunet Courier user I.D. JMK1 would be very welcome. Hope to see many of you at one or both of these two shows.

--oOo--

## ASSEMBLER INSTRUCTIONS

While the 6510 processor chip is not very different from the 6502, there are some additional assembler language instructions that one should be aware of. These are not advertised by the manufacturers and appear to exist in a number of other processors as well.

AAR	Alter At Random
BAC	Branch to Alpha Centauri
BDC	Break Down & Cry
CML	Compute Meaning of Life
CRASH	Continue Running After Stop or Halt
CSL	Curse & Swear Loudly
CVG	Convert to Garbage
HCF	Halt & Catch Fire
JTZ	Jump to Twilight Zone
OML	Obey Murphey's Laws
RDA	Refuse to Disclose Answer
RLI	Rotate Left Indefinitely
SAI	Skip All Instructions
SFT	Stall for Time
TTA	Try, Try Again

Programmers need not remember this list as the commands are inserted into the program automatically by the computer.

RDG

--oOo--

# REVIEW - MACHINE LANGUAGE FOR THE 64

by Will Light

This is it! If you are one of the many Commodore users who have mastered BASIC and have been saying 'I really must try to learn something about Machine Code', but who have been put off by one glance at the usual teach-yourself-machine-code books, then look no further!

As one who has tried with varying degrees of success to teach my school pupils the fundamentals of machine code for several years, I can state quite categorically, THIS IS THE BEST BOOK ON 6502/6510/6509 PROGRAMMING THERE IS! How can I be so sure? Let me try to give some reasons.

Many books on machine-code programming are written by expert programmers, who haven't a clue about teaching. Jim Butterfield, apart from being the world's foremost expert on Commodore machines, and a brilliant programmer, is also well known for his two-day intensive programming seminars which he has held in many Canadian and American Universities. At these, he takes raw students and turns them into competent programmers in 48 hours. To do that, a teacher has to know exactly what to teach, how to teach it and in what order. It is this experience which makes this such a great teaching book.

The book assumes no knowledge of machine code and little programming knowledge of any kind. (It might be handy to know what a loop or a branch is, but not essential.) The first chapters cover all fundamental details such as how hexadecimal notation works, how to use a monitor, and what goes on inside the processor chip. Nothing is forgotten.

The book teaches real machine code, not assembler code. By this I mean that, although assemblers are mentioned, and op.codes are used in their mnemonic form, not binary, the approach to learning about the processor is via the use of a simple monitor program with a primitive assembler function only. (Supermon is used, and is available from the ICPUG library.) This approach means that the learner really gets a feel for the processor and how it works, rather than letting a complex assembler do most of the work. (This approach is also used by Fred Offler in the ICPUG machine code course; see Newsletter Vol 7, No 1, p15.) You will have gathered by now that I think this book is the best thing since sliced bread, but what is actually in it ?

There are eight chapters, which take the learner through all there is to know about 65xx programming. Each chapter is written in an informal, chatty style, but without the appalling attempts at humour

which bedevil some beginners' books. At the end of each chapter is a 'What you have learned' summary, some questions to answer and suggested projects to attempt.

It is essentially a practical course. One needs to sit at the keyboard, with Supermon running and work through the examples and exercises given as one reads about them. The correct results with explanations of all the steps are given in the text.

The Chapter headings are as follows:

1. First Concepts, 2. Controlling Output, 3. Flags, logic and input, 4. Numbers, Arithmetic and Subroutines, 5. Address Modes, 6. Linking BASIC and Machine Code, 7. Stack, USR, Interrupt and Wedge, 8. Timing, Input/Output, and Conclusion.

This takes us up to page 146. The book has 326 pages! What is in the rest? The answer is, quite simply, everything you will need to get the best out of your Commodore machine with your new-found skill at machine code!

There are a series of no less than ten appendices and a glossary. The following is a list of the appendices with some comments.

A. The 6502/6510/6509/7501 Instruction Sets.

B. Some characteristics of Commodore Machines. This is a potted history of all the Commodore Computers up to and including the Plus 4, giving the similarities and contrasts between the machines.

C. Memory maps. There are detailed memory maps of all the machines ranging from the original 'Old-ROM' PET and the VIC 20, through the 8000 series machines to the 64 and Plus 4.

D. Character Sets. This is a 'Superchart' showing not only the full character sets of all the computers, but the machine code op codes also. This is invaluable when peering about using a monitor.

E. Exercises for alternative Commodore machines. All the exercises in the chapters are written assuming that a 64 is being used. This appendix gives the same exercises modified for use on unexpanded VIC20 or PET/CBM

F. Floating point representation.

G. Uncrashing. Hints on what to do if your lengthy program crashes out!

H. Supermon Instructions. This section also contains the listing of a 'Do-it-yourself' Supermon. I would advise you to get the program from the library, as it contains well over 200 lines of data. However, if you can't wait and must type it in, the loader does check sums and reports any mistakes you have made in typing the data in!



I. IA chip information. Not for the beginner this! But if you want to interface your 64 to exotic peripherals or want to output complex sprites from the VIC chip to an unusual video monitor, then all the information you could possibly want is here.

J. Disk users guide. This contains an explanation of the public domain software from Jim which forms the bulk of the latest disk in the ICPUG library. The book is rounded off with a Glossary of terms and a comprehensive index.

If you are a novice who wants the mysteries unravelled, then rush out and order it. If you are an expert, you cannot afford to be without the reference tables which form the second part of the book.

'Machine Code for the Commodore 64 and other Commodore Computers' by Jim Butterfield is published by Prentice-Hall and costs £10.95.

--oOo--

## TEACH YOUR GRANDMOTHER 11

They say great minds think alike. Whilst Grandpa would not dream of aspiring to the dizzy heights of our illustrious chairman, he was rather peeved to find himself pipped to the post to re-introduce the Mike Gross-Nicklaus 'dummy line'. On page 144 of this issue of the Newsletter you will see the use of this 'intriguing technique explained by Mick Ryan. Still, there has to be some advantage to being Chairman, and Grandma has been nagging Grandpa to prune the roses.

Grandpa

--oOo--

## SPREAD THE WORD

When contacting firms who have advertised in the Newsletter, will members please mention ICPUG, as it appears that some advertisers do not believe that advertising in our pages is effective. Whilst we have no intention of filling the newsletter with ads, the odd few do help to keep down costs.

HGV

## DRAWING CIRCLES

by Mike Todd

A recent comment in the South-East group's newsletter prompted me to offer some ideas on drawing circles. Although many BASIC extensions allow circles to be drawn, they rarely use efficient methods and some (such as BC BASIC) don't have such features at all.

Inefficient algorithms seem to abound and so I did some research and came up with two very quick methods of circle drawing. I claim no originality for the algorithms, which are based on the Digital Differential Analyser (DDA) described in 'Principles of Interactive Computer Graphics' by Newman and Sproull, published by McGraw-Hill.

This is an excellent book on computer graphics techniques and is probably the definitive reference work, bringing together a wide range of techniques and procedures from several line drawing algorithms right through to three-dimensional techniques and surface shading. Unfortunately, such techniques are steeped in mathematics, so you'll need a fair mathematical background to go beyond the simpler techniques.

The usual methods of circle drawing are based on simple mathematics, but they lose speed due to the need to repeatedly calculate squares or SIN and COS functions.

The first method described here requires addition, subtraction and a division for each point. Division is normally quite slow, but the choice of the divisor K can be such that it is a power of 2, thereby making the divisions in lines 120 and 130 very quick and the whole routine is fast and efficient.

If plotting single points, as in this example, K should be chosen to be the nearest power of 2 that is lower than or equal to the radius. This is necessary to ensure that enough points get plotted to fill the full circumference and if K is too low, then the circle will end up dotted.

Purists will point out that this routine actually draws an ellipse but a true circle will probably come out as an ellipse anyway on the screen due to differences between horizontal and vertical scaling. In any case this can be corrected as described later.

A simple PLOT command is assumed to be available - replace this with the equivalent in your own BASIC extension. X0,Y0 is the centre of the circle and R is the radius:

```

100      X=0: Y=R: K=16
110      PLOT INT(X+X0+.5), INT(Y+Y0+.5)
120      X=X+Y/K
130      Y=Y-X/K
140      GOTO 110

```

The more traditional method of plotting a circle uses SIN and COS functions for each point - however, the following routine makes do with calculating a SIN and COS at the very start, thereby speeding things up. N is the number of points to be plotted in the circle.

```

100      Q1=COS(2*PI/N): Q2=SIN(2*PI/N)
110      X=0:Y=R
120      PLOT INT(X+X0+.5), INT(Y+Y0+.5)
130      FOR I = 1 TO N
140      XX=X: X=X*Q1+Y*Q2
150      Y=Y*Q1-XX*Q2
160      PLOT INT(X+X0+.5), INT(Y+Y0+.5)
170      NEXT I

```

If you still find these routines too slow, especially if working in BASIC, then a significant speed-up can be made by changing the PLOT to a DRAW TO type command, so that the circle ends up as a polygon with N sides, and then reducing the number of points calculated. If N is reasonably large, then the circle will look pretty good. If N is 3, the routine will draw a triangle - and so on.

Both routines calculate the X and Y offsets from the centre, hence the need to add in the origins. The INT (. . . + .5) is needed to round the results (try plotting without the INT or .5 and see what happens).

There is scope for experimentation in these two routines - for instance, in the second, try changing the XX in line 150 to simply X and you'll get a spiral if you loop often enough.

In both examples, the ellipticity of the shape can be altered by multiplying the X or Y values in the PLOT commands by a constant. This will be at the expense of some speed of course but it may be necessary to make this adjustment to compensate for the fact that the screen display itself is different in scale in the horizontal and vertical directions.

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## TECHNICAL HELP

One of the most useful features of belonging to a User Group is the ability to pick the brains of other members. ICPUG has an international reputation for its technical expertise on Commodore products but many members are unable to attend club meetings and therefore miss out on our wealth of knowledge.

Three of our more illustrious committee members have rashly volunteered to act as 'agony aunts' and deal with members' technical and programming problems. Before explaining how to contact them will members please note these people each have a job and a family and that computing is a hobby in their spare time. Therefore do not expect to receive an answer by return of post or lose your temper if their suggestion doesn't work.

If you write in with your problem don't forget to enclose a stamped, self-addressed envelope for the reply. When making contact don't forget to give your current membership number and state precisely what combination of equipment you are having problems with. Programming problems are best accompanied by a listing with enough REMs to allow it to make sense at a quick glance. If you're on the telephone then give your number as your chosen 'agony aunt' may prefer to reply by phone rather than an involved letter or mailbox.

### 'Agony Aunts'

Ron Geere  
109 York Road  
Famborough  
Hants GU14 6NQ

Systel:- 252542921

Mike Todd  
27 Nursery Gardens  
Lodgefield  
Welwyn Garden City  
Herts AL7 1SF

Systel:- 919991913

Rae West  
4 Highview  
Holford Road  
Hampstead  
London NW3 1AG  
Phone:- 01-794 7241  
(only before 9pm)

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## ICPUG 64 LIBRARY REORGANISATION

Due to massive increase in demand, the library has been reorganised. There are now 14 librarians who each copy both disks and cassette programs. You are asked to send your request to the appropriate one.

Please observe the rules, in particular, state requirements, quote membership no, enclose return postage and sticky label with your own address. Note maximum of 2 disks or 4 tape programs at a time. Please ensure that your packing is adequate and not falling to bits! Please do not seal it with so many staples or tape that it is impossible to reuse (3 staples is usually quite enough!). We much prefer proper disk mailers as they are so easy to open and seal again. Do not expect us to wrap up parcels for you, label your disks, put on write protect tabs or enter into any correspondence. Direct any questions to the library coordinator or program controller.

And finally, please note that we are all amateurs and unpaid members of your own club, doing this for you in our spare time. If your programs are delayed, there is a good reason! Please do not treat us as your paid servants!

UK ADDRESSES, SURNAME BEGINS WITH -

A or D Kenneth J Hill, 25 Mount Avenue, Rayleigh, ESSEX SS6 7HS

B Fred Owens, PO Box 3241, RAF Mildenhall, SUFFOLK

C R Burns, 48 Grasmere Rd, Royton, Oldham, LANCS OL2 6SR

E I J K Mike Hingston, 1 Stafford Road, Eccles, MANCHESTER M30 9HN

F G Geoff Crowther, 60 Fleckney Rd, Kibworth Beauchamp, LEICS LE8

H Barry Whitelaw, 25 Buckerills, Basildon, ESSEX

L N O Nigel Corry, 4 Horsted Way, Rochester, KENT ME1 2XY

M Raymond Medford, 7 Thom Grove, Hale, Altrincham, CHESHIRE

P U V     Bill Hull, Rocklea, Pilling Lane, Preesall, Blackpool, LANCS  
X Y Z

Q R T     Tony Harrison-Smith, 150 Moreland Avenue, Benfleet, ESSEX

S           Brian Wise, 17 Knighton Close, South Croydon, SURREY CR2

W           Chris Wright, 37 Cecil Street, Lytham-St-Annes, LANCS FY8

GERMANY incl BAOR

Brian Carrel, Berlin ICPUG, 29 Signal Regt, BERLIN BFPO 45.

OVERSEAS ADDRESSES OTHER THAN ABOVE

David Jowett, Windmill Electronics, 335 Red Bank Rd, Bispham, BLACKPOOL  
FY2 0HJ

OFFERS OF NEW PROGRAMS - PROGRAM QUERIES

to Dave Vorberg, 46 Fensome Drive, Houghton Regis, Dunstable, BEDS LU5

ANY OTHER MATTERS, LIBRARY LISTS, HELP, COMPLIMENTS and complaints

to David Annal, 142 Windermere Road, London SW16 5HE.

DA

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TOTALLY NON-CBM DEPARTMENT

If anyone was so fed up with Commodore that he bought a QL, and then decided that after all he needed an Apricot Xi, then Peter O'Neill (tel. 01-607 1996) is ready to tell him how to get Quill files across from the former to the latter. [We objected that this is hardly stuff for Commodore Users, but Peter said you never know - Ed.]

## PET LIBRARY

In an effort to move away from reams of paper, I have set up Catalogue Disks for the 'PET' Library in both 4040 and 8050 formats.

The Catalogue Disk contains a header program ("LIST-ME.CATALOG") followed by a directory for each library disk, saved as a program. To see what programs are on each of the disks in the library, simply LOAD the program with the name of the disk you want to see and LIST it either to the screen or to a printer.

To obtain a copy of the Catalogue Disk, apply in the usual way, specifying that you require the Catalogue, and state WHAT FORMAT is required. Tape users should request printed copies of the Catalogue, as previously.

When requesting items from the library, the following rules apply. Please include:

Membership Number

A statement of what you want

Disks or tape, as required

Return postage (stamps please, for ALL UK requests)

Re-usable packaging suitable for return

Pre-addressed label for return

DPC

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## PRINTER/PLOTTER GROUP

Steven Birks wants to start a subgroup for users of the CBM1520 printer/plotter (a 'splinter/plotter' group?) with the aim of exchanging programs, hints, tips, etc. Would anyone interested contact him (with an SAE) at 86 Birches Head Rd, Birches Head, Stoke-on-Trent ST1 6LJ, or on Prestel (782279612) or Compunet (SCB1)? And if anyone has any programs they would like to send him on disk or cassette, he will make a collection and return their disk/cassette with others' programs on it.

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# SPOOLPRINT4 - A UTILITY

by Mick Ryan

(Reproduced by courtesy of ICPUG SE, from their Feb'85 N/Letter No24)

Mick uses an MX80 printer connected to the PET, and a CBM DPS 1101 connected to the 64. He runs Superscript on the PET, but finds that he cannot output text to his best printer, as the Interpod only recognises an IEEE master from the 64 side. The solution is to make all of the textfiles into 'spooling files', and to print them later, from the 64, using his program given below. He assures me that this is not as tedious as it might sound, as one soon gets into the routine, and one usually manages to save up a lot of files to do in the same session.

```
10 REM SPOOLPRINT4           7 JAN 85

100 OPEN 15,8,15

200 INPUT "DOCUMENT NAME";N$
300 OPEN 5,8,5,"0:" + N$ + ".S,R"
400 GOSUB 2000: REM ERROR CHECKING

500 OPEN 4,4

600 GET#5,X$
700 SR=ST
800 IF X$="" THEN PRINT "CHANGE PAPER": GOSUB 3000
900 PRINT#4,X$;
1000 IF SR<>0 THEN 1100
1050 GOTO 600

1099 REM FINISH PROGRAM IF END-OF-FILE
1100 PRINT#15: CLOSE 15
1200 PRINT"FINISHED": PRINT: PRINT "RUN<3CuU>": END

1999 REM ERROR CHECKING
2000 INPUT#15,A$,B$,C$,D$
2100 IF VAL(A$) >0 THEN PRINT A$,B$,C$,D$: STOP
2200 RETURN
```



```

2999 REM REMOVES LONG STRINGS OF NULLS AT END-OF-PAGE
3000 PRINT "PRESS ANY KEY TO CONTINUE"
3100 GET A$: IF A$="" THEN 3100: REM WAITS FOR YOUR SIGNAL
3200 GET#5,X$: REM READS THE STRING OF NULLS
3300 IF ST <> 0 THEN 1100
3400 IF X$="" THEN 3200: REM UNTIL NONE LEFT
3500 RETURN

```

```

3999 REM USEFUL LINES FOR EVERY PROGRAM TO HAVE
4000 SAVE"@0:SPOOLPRINT4",8: END
5000 CLOSE4: OPEN4,4: CMD4: LIST

```

The operation of the program is explained in the following notes.

100 Open the command channel 15 from the disk drive 8. This is used by the error checking routine at 2000.

200 Obtain the name of the file to be printed, open a Sequential Write file to it, and check that no error occurred.

500 Open a file to the printer.

600 Read a character from the disk.

700 Put the status byte into a temporary variable SR so that we can check later whether it was an End-Of-File.

800 If we have reached the End-Of-Page, which will be signalled by a lot of nulls, use the routine at 3000 to get rid of them, otherwise

900 send the character to the printer,

1000 and finish the program if the status byte indicated EOF.

1050 Otherwise, repeat the block 600-1000.

1100 Closing the command channel 15 has the effect of closing all files.

1200 The three Cursor Ups are to place the cursor over the word 'RUN' after the program stops. Mick finds this useful.

2000 - 2100 is a standard form of error checking routine, in which the error channel report is returned in A\$, B\$, C\$ and D\$. These are printed in the event that A\$ indicates a fault situation, after which the program is aborted.

3000 - 3100 waits until you have changed the paper.

3200 - 3400 The disk file signals 'end-of-page' by a large number of nulls, and these are removed simply by reading characters until the first non-null character. A check is made in 3300 for End-Of-File, Otherwise the routine RETURNS to 900 with X\$ containing that non-null character, ready to be printed.

Mick likes to use his modification of the Gross-NickKlaus' trick for producing blank lines in a program, as in the listing above (though that was actually done with Superscript). The screen or printer listings of the program will be displayed in a similar fashion. At the end of the line before the required blank, add

```
:REM"<delete second quote> <RVS ON> <shifted M>
```

The shifted M is repeated as many times as you require blank lines. If the line already terminates with a REM, simply start with the double quotes immediately after it.

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## CLUB INSURANCE

All national members of ICPUG are covered for accidental damage to their equipment whilst using it for ICPUG purposes on club nights. Any claim must be notified promptly to John Bickerstaff (address inside front cover), who is also able to deal with queries that any regional group may have relating to the insurance.

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## MSD - AN ALTERNATIVE TO THE 4040/1541

by Peter Reynolds

Early in 1984 an American company called Micro Systems Development announced a new line of Commodore-compatible disk drives. Single or dual-drive, it was claimed that they would replace both 1541 and 4040 units. I got my SD-2 dual drive in July 1984 and find it preferable in most respects to those it replaces. It is smaller (30% of the 4040, 85% of two 1541s) and lighter (60% and 80% respectively). It accepts both the slow serial bus of the VIC/64 family and the somewhat faster IEEE connection used by the PET family; I do not know whether both connections may be made at the same time and am leery of experimenting as the rather skimpy instructions are silent on this point and in any event I have yet to find any reason, other than curiosity, for wishing to do so.

### Addressing the drives

Used with a PET, you would hardly know it was not a 4040. Drive 0 comes on the left instead of the right but this is apparently alterable if you wish: I have not bothered. The unit is set up with address 8 and this too can be altered either by repositioning one or two jumpers on the printed circuit board inside the case, or by software. In the latter case the program differs slightly from one designed for the Commodore units because, it seems, a relevant buffer resides at a different location in the disk controller's memory map. Could this niggling difference, which forces me to add a couple of lines to the standard 'Change unit address' routine, be influenced by a need to avoid charges of copying part of Commodore's design? The designer of this clever product is reputedly an ex-member of the ever-changing Commodore team.

It is not possible to address the two drives as separate units, say 8 and 9, they can only be addressed as drives 0 and 1 of the same unit. This is a limitation with the 64 when using protected software which, like Multiplan, will recognise a pair of disk units but not a dual drive unit. And of course the serial connection slows down most VIC/64 disk activities to the leisurely tempo of the 1541 or even some 8% slower where (I am told) cautious engineering has made this sacrifice to avoid timing differences with other peripherals on the serial bus. For this and other pearls of technical hearsay repeated in this article I am indebted to Morton Kelson of Long Island, New York, an

enthusiast with a probing mind and a ready screwdriver and a fellow-member of the NYACC in 1983 and 1984.

### Tell-tales

The SD-2 has five indicator lights against four on a pair of 1541s and three on a 4040. A 'power on' indicator also acts as a coded tell-tale if the built-in diagnostic test program detects any fault when the unit is switched on. That has not happened to me yet but (it says in the instructions) the number of recurring flashes, from one to seven, will identify any of seven fault conditions, be it in the disk unit's microprocessor, RAM, ROM or either of the drive mechanisms. Those who have suffered indeterminate faults with their Commodore drives will appreciate this diagnostic facility and might even find that it can save them money if and when a failure occurs. The other lights, two per drive, indicate respectively when each controller and drive mechanism are active.

### External connections

The two single-sided half-height drive mechanisms by TEC are mounted vertically, side by side. There is no ejector spring or flap in the disk-locking system: the central cones are positioned and the read/write head brought into contact with the disk by turning a locking lever through 90 degrees clockwise, for each disk. This arrangement has a reassuringly positive feel to it which is reinforced by the sizeable notch in mid-slot which allows each disk to be firmly gripped by finger and thumb as it is inserted or withdrawn. With this drive there should be none of that fishing for jammed disks that will not allow themselves to be ejected.

At the back of the metal case is the usual pair of serial bus sockets, allowing further devices to be connected in a 'daisy chain' pattern. Midway between them is the IEEE socket, as found on PET peripherals, but when the usual nesting connector is inserted the side-entry cable obstructs one of the two serial port sockets. This will be avoided if you use an 'insulation displacement' type of 24-way connector (that you clamp on, instead of soldering) with 24-way ribbon cable. It is cheaper, too, than the usual made-up IEEE cable if you can do without the stacking facility. The power switch is easily found by reaching over the top of the unit: nearby are an accessible fuseholder and the same pattern of power input socket met on many Commodore peripherals.

### Power supply

The mains goes, I understand, via an interference suppressor to a heavy transformer. The advanced engineering that characterises this product does not extend to the lighter-weight switched power supply popularised in the early Apples and now regularly found in compact 5 1/4" disk drives. Back in 1983 Commodore in the USA were seeking to recruit engineers with experience of this technology but nothing seems to have come of it yet. Nor is MSD's traditional power transformer wound for a choice of mains voltages: I elected for 110 volts, rather than the alternative of 220 volts, partly in case I wanted to use the drive in the USA (though it turns out to be too heavy to lug easily from country to country) and partly to avoid over-running the device from my domestic mains which normally supply 245 volts, plus or minus the statutory 10%: it is easier to get 110 than 220 volts from a 245 volt source. Incidentally, the early 1541s had (according to the book) the mains transformer tapped for 117 or 235 volts but my own drives, of both UK and US sources, have different colour coding on the transformer tappings and appear to have dropped this useful option. Like the 1541 drive, the MSD mechanism is unaffected by the frequency of the mains supply.

### No bumps

If the MSD drive is used with one of those protected disks that has deliberate errors on one or more tracks, you will notice the absence of distressing chatter when the head seeks to realign itself (by bumping against an end-stop) after encountering each error. Apparently the datum point for head movement is determined optically in the MSD, so wear and tear and misalignment faults should be much reduced. Of course, some 1541 users already POKE out those unwelcome bumps, when they remember to do so.

### DOS compatibility

The DOS is claimed to be fully compatible with CBM's DOS 1 and 2; the only difference I have found is in the area addressed by software for changing the device number from 8 to 9, 10 or 11 and the manual gives details of the small amendments needed. It is also said that some protected programs, whose security against copying includes reference to the DOS as the program is booting, will not run on the MSD drive. This has not bothered me as I have little occasion to boot such disks on this unit. A useful facility supported by the MSD DOS is a backup command which copies a complete disk from Drive 0 to Drive 1 in less

than two minutes.

#### Availability

The MSD drives, single and dual, were marketed by a company called Telesys in Fremont, California and in April or May 1984 they told me that they had made arrangements to appoint agents in the UK. It has not happened visibly yet and perhaps the rising dollar has made that trade unviable, for the recommended US prices were then \$395 and \$695 and now would presumably be significantly greater numbers of pounds, too high for the mass markets. Other Commodore-compatible disk drives have been announced from time to time. An early example was the Computhink, followed by Pedisk, but neither would read standard Commodore (4040 or 1541) disks. Later a French supplier announced a drive that could be 'personalised' to several brands of computer, including PET, Apple and Tandy, but the venture was still-born. The Concord drive for the CBM-64 was announced about the same time as the MSD, i.e. early in 1984, but I have not seen one nor heard of anyone who has.

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## REGIONAL AND SPECIAL-INTEREST GROUPS

The list of contacts is never static in an amateur organisation: to report changes or for help to establish a new Group you should get in touch with Tim Amot, ICPUG Regional Organiser, 32 Shaftesbury Road, SOUTHSEA, Hants PO5 3JR (Compunet ID: TWA1).

The latest list includes, for the first time, a SIG or Special Interest Group. This trailblazer is for genealogists, both active and potential keepers of family trees, and further details will be found under N (for National) in the list of Contacts.

Several other specialist enthusiasms might spawn SIGs - specific languages, for instance, or interfacing to sensors and control devices, or education, or music, or ham radio, or cryptology, or meteorology, or modelling and simulations, or medical applications, or chess, or international exchanges, or cataloguing systems, or communicating with other computers. . . If you have such an interest and would like to find others who are like-minded, why not drop a letter to the Editor? [as Steven Birks has done - see p 141]

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## ROUND THE REGIONS

Maida Vale section will be covering adventure games for their April meeting having covered business software during March. Meetings are on the second Thursday of the month from 7.30 p.m. at Mike Franks' 196, Castellain Mansions, Castellain Road, Maida Vale, London, W9 1HD.

Slough Region meet at the Rotunda at Slough College. Recent meetings have seen demonstrations of the C-16 and Plus-4. Although meetings are normally the second Thursday of the month, April's meeting may not be. Details from Brian Jones, 53, Beechwood Avenue, Woodley, Reading, Berks. (Compunet ID BJ2).

Manchester Region have got off the ground and their March meeting covered Astrology, with Business software as the subject for April's meeting on the 1st. Perhaps 'Steve' will keep in touch for I have no surname, address or venue details.

North Hants Region were treated to an evening of music synthesis recently with Pete Maclaurin of Commodore supplying the demonstration of hardware and software. The evening ended abruptly with a bang when the electric kettle was plugged in. . . . Meetings are held at the Adult Education Centre, France Hill Drive, Camberley from 7p.m. April's topic will be the Forth language.

Nottingham section came to the rescue of their landlords recently in a most novel way. They meet in the library of the headquarters of the Federation of Congregational Churches and following a fire in a nearby building the church was unusable. With a 4032 plus Visible Music Monitor members produced all the music for the Sunday service. Who would have thought that even church organists can be replaced by computers? The section meets on the forth Monday of the month; details from Doug Harvey - Nottingham 608491.

Now that I am in a position to resume writing this column, it is hoped that regional secretaries will keep me updated with meeting details, newsletters and information concerning your activities, either by post, or when some problems have been resolved, via Compunet.

Ron Geere

109, York Road, Famborough, Hants, GU14 6NQ

## REGIONAL GROUP CONTACTS as at 17 MARCH 1985

### Berkshire , Bracknell

Mrs Lewin , ( Organiser. ) , 9 Windlesham Road , BRACKNELL , Berkshire RG12 1JX  
Tel: Bracknell 0344-423115 (home)  
Meets: Based on local Church.

### Berkshire , Slough

Mr B Jones , ( Organiser ) , 53 Beechwood Avenue , WOODLEY , READING , Berkshire RG5 3DF  
Tel: Reading 0734-661494 (home) Slough 0753-34585 Ex 81 (work)  
Meets: Slough College of Higher Education, Wellington Street, Slough. 2nd Thursday. 1930-2230 hrs

### Buckinghamshire , Aylesbury

Mr K H Knight , ( Organiser ) , 22 Mount Street , AYLESBURY , Buckinghamshire HP20 2SE  
Tel: Aylesbury 0296-5181 (home)  
Meets: Mandeville Cty Sec Mod School, Churchill Avn, Aylesbury Every Friday during term. 1930-2130

### Cambridgeshire , Peterborough

Mr A P J Scott , ( Secretary ) , 18 Coventry Close , Werrington PETERBOROUGH , Cambridgeshire PE4 6NF  
Tel: Peterborough 0733-74819 (home) Peterborough 0733-53161 Ex 381 (work)  
Meets: Rm A24, Bretton Woods School, Peterborough Every other Wednesday 1900-2200

### Cheshire , Macclesfield

Mr M Mayers , ( Organiser ) , 46 Green Street , MACCLESFIELD , Cheshire SK11 1JQ  
Tel: Macclesfield 0625-32852 (home)  
Meets: Fernain Club, Oxford Road, Macclesfield Every other Monday 2000-2230hrs

### Cheshire , Stockport

Mr P J Hogan , 3 Greenhalgh Street , Heaton Norris , STOCKPORT SK4 1SR  
Tel: Manchester 061-429-6519 (home)  
Meets: \* (Ask Contact)

### Cleveland , Cleveland

Mr L P Butler , ( Organiser ) , 14 Wolsingham Drive , THORNABY Stockton on Tees , Cleveland TS17 9DW  
Tel: Stockton on Tees 0642-762526 (home)  
Meets: \* (Ask Contact)

### Clwyd , Connah's Quay

Mr J Poole , ( Organiser ) , 6 Ridgeway Close , CONNAH'S QUAY , Clwyd CH5 4LZ  
Tel: Deeside 0244-815277 (home)  
Meets: RAF Sealand and 6 Ridgeway Close, Connah's Quay Every Wed(RAF) + 2nd&4th Tuesday 1630-1930

### County Antrim , Belfast

Mr D Weddell , ( Organiser. ) , 9 Upper Cavehill Road , BELFAST , BT15 5EZ  
Tel: Belfast 0232-711560 (home)  
Meets: Last Wednesday in month.

### County Antrim , Northern Ireland

Mr D Bolton , ( Organiser. ) , 18 Carrickburn Road , CARRICKFERGUS , County Antrim BT38 7ND  
Tel: Carrickfergus 09603-63788 (home) Carrickfergus 09603-69129 (work)  
Meets: \* (Ask Contact)

### Cumbria , Kendal

Mr D R Walker , ( Contact. ) , 7 Kent Park Avenue , KENDAL , Cumbria LA9 5JT  
Tel: Kendal 0539-22863 (home)  
Meets: \* (Ask Contact)



**Derbyshire , Derby**

Mr R N Davies FBCC, DCLP , 105 Normanton Road , DERBY , Derbyshire DE1 2GG  
Tel: Derby 0332-514016 (home) Derby 0332-41025 (work) Systel No: 332514016  
Meets: Derby Professional Colour, Osmaston Works, Osmaston Rd, Derby. 2nd & 4th Tuesday 1900

**Dorset , Poole**

Mr D M Shave , ( Organiser. ), 97 Canford Cliffs Road , POOLE , Dorset BH13 7EP  
Tel: Bournemouth 0202-700428 (home)  
Meets: \* (Ask Contact)

**Durham , Durham**

Mr J Cocallis , ( Organiser ), 20 Worcester Road , Newton Hall Estate DURHAM , Durham  
Tel: Durham 0385-67045 (home) Systel No: 219990467  
Meets: 32 Old Elvet, Durham Every Thursday 1900

**Dyfed , Burry PortLlanelli**

Mr F Townsend , ( Contact. ), Maes-yr-Afon Pinged , BURRY PORT , Dyfed SA16 0JE  
Tel: Kidwelly 0554-891065 (home)  
Meets: \* (Ask Contact)

**Dyfed , Talybont**

Mr S Kniveton , ( Regional Contact. ), Penpompre Hall , TALYBONT , Dyfed  
Tel: Talybont 097086-303 (home)  
Meets: Regional contact. Informal group.

**Eire , Dublin**

Mr J D Malone , ( Organiser. ), Software Village , 2 Leeson Park , DUBLIN 6  
Tel: Dublin 0001-963488 (work)  
Meets: 2 Leeson Park, Dublin

**Eire , Dublin South**

Mr T MacDonald , ( Organiser. ), 2 Sycamore Road , Mount Merrion , County DUBLIN  
Tel: n/a  
Meets: \* (Ask Contact)

**Essex , Basildon**

Mr W W Green , ( Organiser ), 151 The Hatherley , BASILDON , Essex SS14 2QH  
Tel: Basildon 0268-22430 (home)  
Meets: \* (Ask Contact)

**Essex , Cattle Point**

Mr M A Cooper , ( Chairman ), 12 Newpark Road , South Benfleet , Essex SS7 5UT  
Tel: South Benfleet 03745-52685 (home) South Benfleet 03745-52885 (work)  
Meets: Richmond Hall, High St, South Benfleet Every other Monday 1900-2200 hrs

**Essex , Chelmsford**

Mr J G Ross , ( Organiser ), 38 Quill Drive , CHELMSFORD , Essex  
Tel: Chelmsford 0245-441948 (home) 01-637-9111 Ex 2118 (work)  
Meets: \* (Ask Contact)

**Essex , Colchester**

Mr D Day , ( Organiser ), 11 Park Vale Close , CASTLE HEDINGHAM , Essex CO9 3DS  
Tel: Heddingham 0787-60148 (work)  
Meets: \* (Ask Contact)

**Essex , Ford Dagenham**

Mr R C Cooper , ( Secretary. ), 117 Belmont Road , ERITH , Kent DA8 1LF  
Tel: Dartford 98-337448 (home) 01-592-3000/2189/2688 (work)  
Meets: Thames Foundry Bldg, Thames Avn, Ford Motor Co., Dagenham. 6 weekly on Monday. 1400

#### Gloucestershire , Cheltenham

Mr E Syratt , ( Secretary ), 14 Branch Hill Rise , Charlton Kings CHELTENHAM , Glos GL53 9HW  
Tel: Cheltenham 0242-528678 (home)  
Meets: Cheltenham Ladies College, Archway Entrance, St George's St Last Thursday. 1930

#### Gloucestershire , Dursley

Mrs J Rich , ( Organiser. ), Rose Cottage , 20 Old Court, Springhill , CAM GL11 5PF  
Tel: Dursley 0453-47708 (home)  
Meets: Rednock School, Dursley Last Friday in month. 1900-2200 hrs

#### Hampshire , Basingstoke

Mr M Bell , ( Organiser ), 250 Gershwin Road , BASINGSTOKE , Hampshire RG22 4HL  
Tel: n/a  
Meets: \* (Ask Contact)

#### Hampshire , Farnborough

Mr R Geere , ( Organiser. ), 109 York Road , FARNBOROUGH , Hampshire GU14 6NQ  
Tel: Systel No: 252542921  
Meets: 235 High Street, Aldershot. 3rd Wednesday in month.

#### Hampshire , Gosport

Mr B Cox , ( Organiser. ), 10 Staplers Reach , Rowner, GOSPORT , Hampshire PO13 0EY  
Tel: Fareham 0329-280530 (home)  
Meets: 10 Staplers Reach, Gosport, Hampshire 1st & 3rd Friday 1900-2230

#### Hampshire , Petersfield

Mr A J Cooke LRSC , ( Organiser, Reg Prestel Ed ), 7 Russell Way , PETERSFIELD , Hampshire GU31 4LD  
Tel: Petersfield 0730-62840 (home) Hazelmere 0428-55569 (work) Systel No: 073062840  
Meets: Meets at Bedales School, Petersfield. 2nd Tuesdays. 1930

#### Hampshire , Portsmouth

Mr N J Ryan , ( Organiser. ), 55 Portchester Road , North End PORTSMOUTH , Hampshire PO2 7HZ  
Tel: Portsmouth 0705-699871 (home) Portsmouth 0705-627681 (work) Systel No: 732453530  
Meets: Portsmouth Polytechnic

#### Hereford & Worcs , Stourport

Mr M J Merriman , ( Organiser. ), 12 York Street , STOURPORT-ON-SEVERN , Hereford & Worcs  
Tel: n/a  
Meets: 12 York Street, Stourport-on-Severn. Last Thursday in month.

#### Hertfordshire , Hitchin

Mr B D Grainger , ( Organiser. ), 73 Minehead Way , STEVENAGE , Hertfordshire SG1 2HZ  
Tel: Stevenage 0438-727925 (home) Systel No: 438727925  
Meets: Provident Mutual Assurance, William Road, Hitchin. Last Wednesday. 1930-2230

#### Hertfordshire , Watford

Mr S Rabagliati , ( Organiser. ), Suite 2, Tarmay House , 146-150 St Albans Road , WATFORD WD2 4AE  
Tel: Hemel Hempstead 0442-44743 (home) Watford 0923-50161 (work) Systel No: 019993223  
Meets: Co-op Hall, St Albans Road, opposite junction with Lowestoft Road. 2nd Monday. 1930

#### Iceland , Eskifjordur

Mr G Gislason , ( Organiser ), Syntax , Bleiksarhlid 4 , 735 Eskifjordur  
Tel: n/a  
Meets: \* (Ask Contact)

#### Isle of Man , Douglas

Mr J W F Livsey , ( Organiser ), Datacentre Ltd, 4 Athol St , DOUGLAS , Isle of Man  
Tel: Douglas(IoM) 0624-25538 (work)  
Meets: \* (Ask Contact)

#### Kent , Canterbury

Mr R Moseley , ( Secretary ), Rosemount , Lord Romney Hill, Weaving , MAIDSTONE  
Tel: Maidstone (0622) 96-37643 (home) Maidstone (0622) 96-37643 (work)  
Meets: Physics Lab, Kent University. 1st Wednesday in month. 1945

#### Kent , South East

Mr D Pettet , ( Membership Secretary. ), 69 Charterhouse Road , ORPINGTON , Kent BR6 9EN  
Tel: Orpington (0689) 94-23505 (home) 01-828-8070 Ex 2305 (work) Systel No: 066923505  
Meets: Charles Darwin School, Jail Lane(Terms); BH Library, Churh Rd(Hols) Every Thursday except first 1930-2'

#### Lanarkshire , Bellshill

Mr W G McLuckie , ( Organiser. ), 15 Roman Drive , BELLSHILL, Nr Motherwell , Lanarkshire ML4 2JQ  
Tel: n/a  
Meets: \* (Ask Contact)

#### Lancashire , Blackpool

Mr D W Jowett , ( Organiser. ), 197 Victoria Road East , THORNTON , Blackpool FY5 3ST  
Tel: Blackpool 0253-869108 (home) Blackpool 0253-56635 (work)  
Meets: \* (Ask Contact)

#### Lincolnshire , Boston

Mr R Ashton , ( Chairman ), 17 Coningsby Close , BOSTON , Lincolnshire PE21 0HP  
Tel: Boston 0205-66115 (home) Boston 0205-61122 (work)  
Meets: Railway Staff Association Club, Boston Railway Station 1st Tuesday 1930-2200

#### Strathclyde , Ayr

Mr J Smith , ( Orgr & Reg Co-ord ), 19 Brewlands Road , SYMINGTON Kilmarnock , Strathclyde KA1 5RW  
Tel: Kilmarnock 0563-830407 (home) Ayr 0292-260321 (work) Systel No: 563830407  
Meets: Symington Primary School, Symington, Kilmarnock 1st & 3rd Wednesdays. 1900-2100

#### London , Acton

Mr K V Meehan , ( Organiser.Feb85 start. ), 236 Chesterton Court , ACTON , London W3  
Tel: 01-693-5850 (home)  
Meets: Acton United Services Club, Berrymead Gardens, Acton W3 Thursday monthly. 1930-2130hrs

#### London , Logica

Mr C Nowikow , ( Organiser ), Logica, 68 Newman Street , LONDON , W1A 4SE  
Tel: 01-637-9111 (work)  
Meets: Logica Ltd, 68 Newman Street, London

#### London , Maida Vale

Mr M M Franks , ( Organiser. ), 196 Castellain Mansions , Castellain Road Maida Vale , LONDON W8 1TB  
Tel: 01-286-0650 (home) 01-493-5141 (work) Systel No: 012860650  
Meets: 196 Castellain Mansions, Maida Vale 1930

#### London , MOD Branch, RAFPCA

Wg Cdr C R Deeley RAF , ( Chairman ), 50 Bedmond Road , Leverstock Green , HEMEL HEMPSTEAD HP3 8LL  
Tel: Hemel Hempstead 0442-55110 (home) 01-218-0988/0546 (work)  
Meets: Northumberland House, Northumberland Avenue, LONDON Mid-week, monthly 1245-1345

#### London , Teddington

Mr G Squibb , ( Contact. ), 108 Teddington Park Road , TEDDINGTON , London  
Tel: 01-977-2346 (home)  
Meets: \* (Ask Contact)

#### London , Wembley

Mr B Vyas , ( Contact ), 277 Ealing Road , WEMBLEY , London HA9 1EU  
Tel: 01-998-3712 (home)  
Meets: \* (Ask Contact)

# Commodore

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**London NW9 , RAF Hendon**

Sgt M Kendell , ( Organiser ), Education Centre , RAF HENDON Aerodrome Road , LONDON NW9 5JB  
Tel: 01-202-6577 Ex 248 (work)  
Meets: Education Centre, RAF Hendon Every Thursday. 1900

**Merseyside , Liverpool**

Mr J Stout , ( Organiser. ), 6 College Avenue , FORMBY , Merseyside L37 3JJ  
Tel: Formby 07048-74266 (home) Southport 0704-31388 (work)  
Meets: Merchant Taylors' School for Boys, Great Crosby. 2nd Thursday. 1900-2300

**Merseyside , Merseyside**

Mr J P Jones , ( Chairman. ), 41 Virginia Avenue , LYDIATE , Merseyside L31 2JW  
Tel: Liverpool 051-526-4613 (home) Liverpool 051-334-4090 Ex 222 (work)  
Meets: Cardinal Allens Grammar School, Honeys Green Lane, W Derby. Alternate Wednesdays. 1930-2200

**Middlesex , Greenford**

Mr R D Green , ( Secretary ), 18 Legion Road , GREENFORD , Middlesex UB6 8XG  
Tel: 01-578-2302 (home) 01-750-7262 (work)  
Meets: Room 7, Greenford Community Centre, Oldfield Lane, Greenford Every Thursday 1900-2200 hrs

**National , Genealogy Interest**

Mrs J Daniels , ( Organiser ), 26 Arden Mhor , PINNER , Middlesex HA5 2HR  
Tel: 01-868-3452 (home) 01-868-3452 (work)  
Meets: \* (Ask Contact)

**New Zealand , New Plymouth**

Dr D R Black , ( Organiser ), Box 5087 , Western New Plymouth , Taranaki  
Tel: n/a  
Meets: \* (Ask Contact)

**Norfolk , Cromer**

Mr J Blair , ( Contact point. ), 7 Beach Road , CROMER , Norfolk  
Tel: Cromer 0263-512849 (home)  
Meets: VIC20 contact point only.

**Norfolk , Wretton**

Mr P Petts , ( Contact ), Bramley Hale , WRETTON Kings Lynn , Norfolk PE33 9QS  
Tel: Stoke Ferry 0366-500692 (home) Stoke Ferry 0366-500846 (work) Systel No: 366500846  
Meets: \* (Ask Contact)

**North Yorkshire , Scarborough**

Mr K J Prince , ( Organiser ), 59 Chantry Road , EAST AYTON Scarborough , North Yorkshire YO13 9ER  
Tel: Scarborough 0723-863737 (home)  
Meets: Gibson's Hotel, Queen's Parade, Scarborough, North Yorkshire 3rd Tuesday 1930-2200

**Northamptonshire , Corby**

Mr P Ashby , ( Organiser ), 215 Lincoln Way , CORBY , Northamptonshire  
Tel: Corby 05363-4442 (home)  
Meets: Lodge Park Sports Centre, Corby Fortnightly Thursdays. 1900-2300 hrs

**Northumberland , Prudhoe-on-Tyne**

Mr J R Christer , ( Organiser ), 16 Redwell Rd , PRUDHOE-ON-TYNE , Northumberland NE42 5AP  
Tel: Prudhoe 0661-35507 (home)  
Meets: Community Centre, West Wylan Estate, Prudhoe-on-Tyne Monthly, ???day 1900-2200 hrs

**Nottinghamshire , Nottingham**

Mr E D Harvey , ( Organiser. ), 68 Roseleigh Avenue , NOTTINGHAM , Nottinghamshire NG3 6FH  
Tel: Nottingham 0602-608431 (home)  
Meets: Castlegate Congregational Federation Building, Nottingham. 4th Monday. 1930-2230

**Oxfordshire , Banbury**

Mr J Temple , ( Organiser. ), Kibanda Rose Bank , BLOXHAM , Oxfordshire

Tel: n/a

Meets: North Oxon Technical College, Banbury

**Oxfordshire , Bicester**

Mr L J Stevens , ( Organiser ), 20 Beaufort Close , BICESTER , Oxfordshire OX6 7NN

Tel: n/a

Meets: \* (Ask Contact)

**Oxfordshire , Witney**

Mrs C Ross-Smith , ( Organiser ), Enghaven, School Road , FINSTOCK , Oxfordshire OX7 3BH

Tel: Ramsden 099386-697 (home)

Meets: \* (Ask Contact)

**Somerset , Somerset**

Mr P Montague , ( Organiser. ), 17 Deane Drive Galmington , TAUNTON , Somerset TA1 5PF

Tel: Taunton 0823-75630 (home) Bristol 0272-777691 Ex 215 (work)

Meets: 12 Laxton Close, Taunton. Starting 1985

**South Yorkshire , Sheffield**

Mr R Wood , ( Organiser. ), 13 Bowland Crescent , Ward Green BARNSELY , South Yorkshire SYO 5JS

Tel: Barnsley 0226-285064 (home) Chesterfield 0246-811585 (work)

Meets: University Building, Mechanical Eng., Mappin Street, Sheffield 1st Wednesday 1915-2100

**Strathclyde , Ayr**

Mr J Smith , ( Orgr & Reg Co-ord ), 19 Brewlands Road , SYMINGTON Kilmarnock , Strathclyde KA1 5PW

Tel: Kilmarnock 0563-830407 (home) Ayr 0252-260321 (work) Systel No: 563830407

Meets: Symington Primary School, Symington, Kilmarnock 1st & 3rd Wednesdays. 1900-2100

**Strathclyde , Glasgow**

Dr J MacBrayne , ( Contact ), 27 Paidmyre Crescent , NEWTON MEARNS , Glasgow

Tel: Glasgow 041-639-5686 (home)

Meets: \* (Ask Contact)

**Strathclyde , Glasgow**

Mr A J Quin , Dept of Environment Studies , Glasgow Coll of Bldg & Printg , 50 N Hancock St G1 2BP

Tel: Glasgow 041-332-9969 (work)

Meets: \* (Ask Contact)

**Strathclyde , Glasgow North**

Mr A Morgan , ( Organiser ), 19 Cragmarloch Ave , TORRANCE , Glasgow , Strathclyde GG4 4AY

Tel: n/a

Meets: \* (Ask Contact)

**Strathclyde , Paisley**

Mr C Heath , ( Organiser ), 41 Thruscraig Crescent , PAISLEY , Strathclyde PA2 6PP

Tel: n/a

Meets: The South End Action Centre, Stock Street, Paisley Alternats Nondays 2015-2230 hrs

**Suffolk , Bury St Edmunds**

Mr A Morris , ( Organiser. ), 30 Kelso Road , BURY ST. EDMUNDS , Suffolk IP33 2EL

Tel: Bury St Edmunds 0284-61870 (home) Bury St Edmunds 0284-69661 (work) Systel No: 028469661

Meets: The Coach House, Long Brackland, Bury St Edmunds. 2nd Wednesday 1930

**Suffolk , Mildenhall**

Master Sergt F Owens , ( Organiser ), Commodore Co-ordinator , Box 3241 RAF Mildenhall , Suffolk

Tel: Erriswell 063881-3481 (home)

Meets: USAF Recreation Centre, RAF Mildenhall. 3rd Sunday in month. 1400

#### Surrey , Camberley

Mr M A Arnold , ( Organiser ), Tanglewood, Ways End , CAMBERLEY , Surrey  
Tel: Camberley 0276-24082 (home) Systel No: 443316184  
Meets: Adult Education Centre, France Hill Drive, Camberley 3rd Wednesday

#### West Germany , Berlin

Major E F Carrel , ( Organiser. ), Berlin ICPUG , 29 Signal Regt , BERLIN BFPO 45  
Tel: Watford 0923-81209 (home) 010-49-30-309-4476 (work)  
Meets: \* (Ask Contact)

#### West Germany , Minden

Mr B Dempster , ( Chairman. ), , 664 Squadron AAC LAD , BFPO 2S  
Tel: n/a  
Meets: \* (Ask Contact)

#### West Midlands , Bloxwich

Mrs M Warden , ( Chairman ), 64 Nursery Road , Bloxwich, WALSALL , West Midlands WS3 2DU  
Tel: Bloxwich 0922-492039 (home)  
Meets: Frank F Harrison School, Leamore Lane, Bloxwich Every Wednesday 7-10pm

#### West Midlands , Coventry

Mr W H Light , ( Chairman. ), 22 Ivybridge Road , Styvechale COVENTRY , West Midlands CV3 5PH  
Tel: Coventry 0203-413511 (home) Coventry 0203-462634 (School) (work) Systel No: 203413511  
Meets: Stoke Park School & Community College. 4th Wednesday. (Not Aug or Dec) 1900-2200 hrs.

#### West Midlands , West Midlands

Mr V Nichols , ( Chairman.(Sec:Bob Vint) ), 3 Prescott Drive , PENKRIDGE , Staffordshire  
Tel: Penkridge 078571-3304 (home) Birmingham 021-556-7857 (work)  
Meets: Old Town Hall, Red Lion St, Wolverhampton. 1st & 3rd Thursdays. 1900

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## MEMBERS' SALES AND WANTS

### FOR SALE

EPSON HX20 complete with Transam 'Comms' chip providing a simple text editor and terminal facilities. Used infrequently to enter text in the field and down-load to PET on return home. Not at present fitted with microcassette - on-board 11K available memory was enough for the purpose. £250 + VAT. Tel. (0932) 47629

SEIKOSHA PRINTER.£75; also PET 16K. Contact Don Forbes of the Croydon Micro Club's Swap shop, tel. 01-688 5794

CBM 3032 computer + Toolkit, Arrow, Exmon chipped in; second character set chip; manuals/cover/cassette; much software. £190. GC Squibb, 108 Teddington Park Rd, Teddington, Middx TW11 8NE, Tel. 01-977 2346

VISCALC to run on the PET 2001, CBM 2001, CBM 8032 32k with 2040/4040/8050 drive. £50. R Patey, tel. 0403 812738 (work), 0403 64027 (home)

### WANTED

CASSETTE player for PET 4032 with cable. Also educational programs on cassette for same. Patrick Lydon, Dun Aoibhinn, Corcullen, Moycullen, County Galway, Eire. Tel. 091 85167

DISK DRIVE - wanted urgently by Youth Training Scheme Workshop, low-cost disk drive for use with 4032 PETs, 4040 preferred. Also useful utilities, programs, what-have-you. Contact Ted Cachart, Derby, tel. 0332 381991 (work) 062 892 3207 (home)

## SHOP WINDOW

The upsurge in communications has resulted in a number of products, mostly modems of various sorts. Two such modems are the MS21/23 and 2123-IAD. The MS21/23 features operation on V21 300 bps answer/originate, V23 1200bps half duplex or 75/1200 and 1200/75 full duplex. In addition there is a Bell 103 and 202 frequency option. BT approved. The IAD model is a souped up version with auto-dial, automatic retry, error correction, speed conversion and automatic line sense. Further details from George Ley, Master Systems (Data Products) Ltd., 100, Park Street, Camberley, Surrey, GU15 3NY. Tel: 0276 685385.

Vic-20 owners can use the Tm110 smart auto-dial modem and Micropack combination. The V23 modem (1200/75) connects directly to the Vic's RS232 interface and can store up to 8 different telephone numbers together with an ID and password which are automatically transmitted. The software requires at least 16K RAM expansion fitted. Prestel pages can be saved and later printed. Price is £152.10 including p&p and VAT from Tandata Marketing Limited, Albert Road North, Malvern, Worcs., WR14 2TL. Tel: (06845) 68421. Prestel \*799#.

A cheap, but versatile modem comes from Unicom Ltd., at £60. Its specification is impressive for its price and seems to include auto-everything, error correction and a Bulletin Board facility. Technical enquiries to Barry Krite on 01-482 1711, orders on Access/Visa accepted. Unicom Ltd., 20, Orange Street, London, WC2 .

Last issue a member complained of lack of interest in the PET user so to redress the balance I will mention the Telemod2 modem which is suitable for Prestel, Micronet, Homelink etc, and includes software and hardware packages for the CBM 3000, 4000, 8000 and C-64. Details from Midwich Computer Company Limited., Rickinghall House, Hinderclay Road, Rickinghall, Suffolk, IP22 1HH. Tel: Diss (0379) 898001.

Another programmable scanner system using the IEEE-488 bus comes from Time Electronics, but what caught my attention was the programmable screwdriver. No kidding, this is a screwdriver programmed from the IEEE bus for use in automatic test equipment. Examples of use would be in adjustments of trimming pots and preset controls. The 9815 screwdriver is available from Time Electronics Ltd., Botany Industrial Estate, Tonbridge, Kent, TN9 2YZ.



A surge-resistant plug is available from Bowthorpe which is claimed to reduce electrical surges from freezers, fluorescent lighting, etc. Looking like a thicker 13A plug it is obtainable from Bowthorpe EMP Ltd., Stevenson Road, Brighton, East Sussex, BN2 2DF. Tel: (0273) 692591.

The C-64 and Vic-20 can be fitted with a numeric add-on keypad which includes decimal point and return (enter) key. The unit fits between the main keyboard connector and the main pcb and is priced at £28.75 (plus £1.00 p&p). Discounts are available on five or more from Commercial Products, 11, Hylands Close, Furnace Green, Crawley, Sussex, RH10 6PS. Tel: (0293) 545791 and 30174.

Music synthesis on the C-64 is provided by a number of packages from MusiCalc U.K. Paradox Group Ltd., The Metropolitan, Enfield Road, London, N1 5AZ. Tel: 01-241 2448. Various packages ranging from £15.00 to £45.00 enable rhythms, synthesis, score writing and templates.

A range of programmable interfaces covering IEEE-488, RS232, parallel I/O and analogue are produced in printed circuit board form by Systron Donner Ltd., St. Mary's Road, Leamington Spa, Warwickshire, CV31 1QN. Tel: (0926) 35411.

Of interest to academic establishments are two items for the BBC microcomputer. One is an interface that enables a Beeb machine to interface to a Commodore printer and dual disk units, the other enables the 8250 dual disk drive to interface to the Beeb. Various utility programs iron out the inherent software incompatibilities. Details from Intelligent Interfaces Ltd., 43b, Wood St., (Cooks Alley), Stratford-upon-Avon, Warwickshire, CV37 6JQ. Tel: 0789 296879.

Adcomp's 18M-byte hard disk, the AP18em, can be accessed by up to four users of 8296 or 8032 machines. The command set is 8050 compatible, but the files can be 4.5M-byte long with 40 open simultaneously. Expandable to 18/36M-byte and single-user option available. IMI Computing Ltd., P.O.Box 216, Birmingham B6 7BA. Tel: (021) 356 4848.

RDC

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#### LAST-MINUTE WANT

Simon Potts wants a single IEEE disk drive, either 2031 or SFD 1001 (not 1541). Telephone (work) 051-641 4317

## DISCOUNT CORNER

Please refer to the January/February edition for other discount details.

### COMPUNET

There are six pages of text on discounts inside the ICPUG CUG which it is hoped to expand. Why not Courier me with your enquiries? My handle is FJB1.

### CLUBSPOT

There are six pages of text on discounts within Micronet (page 810213280). Why not mailbox me with your enquiries? My SYSTEL No. is 016515436.

PRECISION SOFTWARE have kindly agreed to extended their special offer to ICPUG members from the original closing date of 31st March (please see the Precision Software insert in the previous newsletter). Yes! the price for SUPERBASE64 is now £75.00 to members [not £60.00 as I advised in the last newsletter]. Superbase64 Version 2 is now available and so is the program Supertype.

Superscript 3 will be available in May and will be retailed at £99.95 (the ICPUG members price - directly from PSL - will be £75.00) : part exchanges with other PSL programs are being considered for this new product.

### JCL SOFTWARE

The Assembler for the 64 is now being marketed in two versions. Firstly, all in a Cartridge at £66.50 retail, £56.53 to ICPUG members.

Secondly, Cartridge and Disk with the assembler on the disk at £55.00 retail, ICPUG members price £46.76. Order direct, quoting your current membership number, from JCL Software, 47 London Road, Southborough, Tunbridge, Kent TN4 0PB - telephone 0892-27454.

Speedypen for the 64 is a new textwriter by JCL, disk based, retail price £17.25 inclusive. Why not call for a leaflet from JCL and see how much you can get for so little?

### MICRO COMPONENT TRADING CO

This company are about to release a 64k RAM extension for the C16, which will sell at around £60.00. ICPUG members are being granted, when quoting their current membership number, a discount of 20% from this price - for a limited period - when ordering directly from the company, whose address

is:- Group House, Fishers Lane, Norwich, Norfolk NR2 1ET 'phone 0603-666966.

VIC20 software - CBM deletions.

It has not been possible to get this 'stop press' news to Derek Hoare for his column so here are CBM's latest deletions from their VIC20 lists:

Mole Attack - 1912 : Simplicalc Disk - 3301 : Cosmic Jailbreak - 1927 : Snowmen 'n Mathmen - 3423 : Blank Program Cassettes - 2505. Sadly, CBM have also discontinued their CP/M Cartridge for the C64.

JB

--oOo--

The  
**MIDNITE**  
SOFTWARE GAZETTE

The  
**PAPER**

Provisional arrangements have been made by Fred Owens and myself to produce 'Midnite Software Gazette' in the UK for ICPUg members.

To allow those unfamiliar with this excellent source of information on a wide range of matters technical about all Commodore equipment to examine a copy, we are offering a specimen of the latest issue - a bumper issue of 92 A4 pages reviewing the top 150 programs available for Commodore in the US - for £2.00. There are six issues a year (normally about 64 pages) and the UK sub will be a maximum of £20, lower if demand allows (US sub is \$24).

To obtain the specimen copy, send a cheque for £2.00, with your name and address on the back, as soon as possible to:

Mrs A Hedges, 233 Woodham Lane, New Haw, Weybridge, Surrey KT15 3NU

Allow a few weeks for delivery, because the first printing will not be done until the size of the response is clear. (If there should be insufficient demand, and the project be aborted, cheques will be returned.) If you definitely wish to subscribe, please say so when writing for the sample copy.

HdeG

# Micro Swift SPREADSHEET

Micro Swift - the affordable professional spreadsheet system for the Commodore 64. Micro Swift will prove indispensable in business or around the home to construct models of income and expenditure; for carrying out instant 'what-if' calculations to see how a change in one or more figures affects all the other figures; or for specialised applications where complex number crunching is required.

Micro Swift is unique in that it is operated by pop-up menus, a system pioneered by our Magpie database program. No longer do you have to memorise a whole hierarchy of commands and control keys - the menus appear when you want them, and disappear when you don't!

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## READERS WRITE . . .

### HELP WANTED - SADEKTRONICS CHROMADAPTOR

GN Bland, 104 Old Rectory Rd, Farlington, Portsmouth PO6 1AJ, is looking for anyone who can help with information and instructions for this piece of equipment for the PET, the makers of which are no longer in business. The device takes output from the User port and produces colour output in TV signal form. All he can find is a magazine review of it and two sample programmes.

### HELP WANTED - LOS96

Tony, 57 Balnoral Drive, Bramcote, Nottingham writes:

I was very interested to read the letter from AD Lock in the last issue of the Newsletter. I joined in 1983 for the same reasons as that correspondent since my office had invested in a Commodore 8000 series machine, and having become interested in programming, I wanted to get the best out of the hardware. . . .

When we purchased our 8096 machine our supplier also provided a copy of the 96K operating systems management program by S M Software called 'LOS96'. This has enabled me to write BASIC programs occupying upto 40K of memory, still leaving 32K for variables. What I have not been able to do is incorporate the many machine code routines which I have collected from magazines in the days long ago when the Commodore PET ruled supreme.

. . .

I shall be pleased if you could arrange for my query to be . . . published in the magazine and, like Mr Lock, I hope more PET people will stand up to be counted.

[I hope the excellent article on the 8296DG which appears in this issue will go some way to placate the PET brigade - Ed]

Ron Geere, 109 York Road, Farnborough, Hants also writes:

Tony Lock's lament for support for the PET/CBM models is perhaps justified, even so the reasons are fairly straightforward. From Commodore's point of view the reasons are no doubt commercial, leaving the User Group to provide continued support. As the former Newsletter editor I am only too aware that what appears in the magazine is not predominantly the result of the editor's, or of ICPUC's policy. The content is largely determined by those people that write articles. As Hugh's advisor I constantly remind him that there is no place for games in the Newsletter if we are to be considered as a serious user group, almost any other magazine can supply the games appetite to their own detriment. Even Computel magazine is scarcely worth having these days.

The IEEE modem, the 8010 if I remember correctly, was discontinued by Commodore not from choice, but at source (I think the supplier went bust, but I may be wrong). There are problems using your own modem on the PET for Prestel for example, due to the character set and graphics used. No doubt you could write some software to handle the graphics in some way, and cope with any other special conditions. Compunet, however, is a different thing. There are facilities on Compunet that demand a greater degree of security in several senses. Firstly it has error handling that your software or modem must cope with. Secondly, the facility to up- and down-load software and be charged for items ordered over the network call for special security arrangements in the modem. I am not saying that I necessarily endorse the policy decision taken, rather than attempting to provide some idea of the reasoning behind that decision.

Finally, even though the PET does not have RS232 facilities in the operating system, as an old-timer of the PET scene you must be aware that the 6522 chip can output a serial bit stream in RS232 TTL format. I understand that some people have found this a successful method.

BOUQUET - Vera F Birkenbihl sent the following bouquet from W Germany:

I just wanted to tell ICPUG'ers that you make a mighty fine magazine. I have bought lots of back copies and joined ICPUG mainly because of it. At that time I didn't know I would get so involved with COMAL, thus I didn't know that Brian Grainger would be so helpful on a COMAL problem - thanks, Brian.

I find all of your articles well done. I like the chatty style because chatty and informal in your case does not mean sloppy. The combination of solid, good and helpful info presented in your nice easy-going way is a rare combination.

BRICKBAT (not for ICPUG) - on the other hand, NV Freeman, of 3 Blackwater House, Emery Down, Lyndhurst, Hants SO4 7FJ, complains:

I was interested to receive notification of 'Superbase 64 V2 upgrade to new version' - 'extensive goof-proofing, fast fd load, database copy, etc.'. I was appalled, however, to see the price of £28,75.

I think this is outrageous behaviour on the part of Precision Software. There are several other software companies which offer to keep you updated with any improved version, should this arise, at a nominal cost.

I may be wrong, but I think Precision Software owe it to people like myself who had enough faith in their original version to buy it and spend hour upon hour struggling with the program trying to get it to work, i.e. on simple field sorting, for instance. I don't think they should be allowed to get away with this and hope you will give them the necessary adverse publicity which they deserve.

[Well, we do not entirely agree with Mr Freeman, as we have noted in this month's SB column, and time will tell if the public are willing to pay this price. The improvements are not essential for running Superbase. If you don't use it extensively you can do without them: if you need them, the price does not seem so very excessive for a sophisticated database program that costs several hundred quid on a larger micro - Ed]

#### PROBLEM SOLVED

Michael A Jay, 17 Colebrook Croft, Shirley, Solihull, W Midlands B90 2JD has found a solution to a not uncommon problem:

One of the most common and frustrating faults with the Commodore 64 system is loading problems with the C2N tape deck. Users may frequently find a tape will not load on their system but will on someone else's. The reason is that the tape deck is set up in production to accommodate a data transfer rate of 300 baud, but currently much software is designed to run at 1200 or even 3000 baud and at this rate the alignment angle of the head to the tape is critical if a clear signal is to be transferred to the computer.

I have recently solved this problem by using the newly developed Azimuth Head Alignment Tape marketed by Interceptor Micros. Alignment takes only a few minutes. A superb game on the reverse side of the tape loads at 3000 baud and gives a final accuracy check.

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\*also responsible for 64/VIC programs on 8050 disks

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See announcements of new arrangements on pp 139-140

