

The twenty-sixth

# WACC

November 1988 Vol 8 No 11 £1.00 Europe £1.50  
Overseas £2.00

THE WORLDWIDE  
MACCI AMSTRAD MACCI  
CPC USERS CLUB

59 The Green  
Twickenham  
TW2 5TU

Another WACCI exclusive..

## Meddling with MIDI's

All the MIDI machines currently available for the CPC  
have been gathered together in one review. See page 16



---

# THE COMPUTER STORE

Tel. 021 770 0468

Trivial Pursuits Young Players Edition DISC, £9.95

Trivial Pursuits Baby Boomer Edition TAPE £8.95

Little Computer People on DISC ONLY £2.99

The price of a blank disc!

Bomb Jack 1 and 2

Tape £3.99 Disc £5.99

We have a small selection of Infocom Adventures at £14.95

Book - Advanced User Guide Daniel Martin £8.50

Book - Mastering Machine Code on the Amstrad £8.95

Book - A Childs Guide to the Amstrad Micro £4.50

Tape Deck lead and Head cleaner for CPC 6128 only £19.95

Cassette Head Cleaners only 99p post free

New Navigator Joystick from Konix £14.99

Advanced Art Studio Disc £5/off only £19.95

Kids Play Compilation of 10 Games only £4.95

Ten Great Games from Gremlin Only £6.95

The Computer Store

Unit 82 In shops,

2-8 Greenwood Way

Chelmsley Wood

Birmingham B37 5TL

---

WACCI EDITED BY STEVE WILLIAMS

PHONE (01) 898 1090

Conceived and Founded by

JEFF WALKER

**REGULARS**

THANX & STUFF ..... 1  
FAIR COMMENT ..... 4  
PROPERGANDER ..... 10  
P-K4 ..... 9  
AUNTIE JOHN'S DIARY ..... 12  
SIMSPOT ..... 22  
GLENN AT LARGE ..... 28  
THE HARD STUFF ..... 30

**PROGRAMMING**

BASIC MACHINE CODE ..... 18

**FEATURES**

MEDDLING WITH MIDIS ..... 16  
BANK MANAGER .....  
A PASSING THOUGHT ..... 26

PRODUCED BY ..... Steve Williams

ASSISTED BY ..... Joolz Wiggins

PHOTOCOPIED BY ..... Aird Services

COLLATED BY ..... Willing Hands

DISTRIBUTED BY ..... Accident

*No material may be reproduced in whole or part without the written consent of the copyright holders. WACCI cannot undertake to return any unsolicited material unless accompanied by a suitably stamped addressed envelope. No payment whatsoever can be offered or made for any material selected for publication.*

WACCI (c)1988 The Contributors



Here we are again. No need to worry this month, your WACCI has arrived at its normal time. Not much time to dally around this month so I'll cut the preamble and get on with it quick.

**APOLOGIES**

Once again, this month I have to apologise to Alex Aird, Richard Burton, Dennis Leighton and Peter Ceresole who have all had articles postponed from this month due to lack of available space. Oh I nearly forgot to include that old guy who writes the comms column in the list, yes he got put on hold this month too.

**TA VERY MUCH**

Thanx this month to Keith Pomfret who not only managed to con (sorry I meant persuade) every CPC MIDI manufacturer into parting with a machine for his MIDI review but also secured a second 6128 for the WACCI office. This has made producing the mag quite a bit easier and quicker. All I have to do now is save up for another set of Protext, Promerge Plus and Utopia ROMs to "release its true potential."

Many many thanx must also go out to Joolz (it's not her real name) Wiggins who has helped in producing the mag

this month. Not only was it the first time she had used an Arnold but it was also the first time she had used Protext. I wish I had a penny for every time I heard, "Isn't it clever how this program does this?" come floating across from the direction of the second CPC.

**COVER UP**

By the way, do you like the front cover? Are you wondering what the connection is between a big pussycat and an Amstrad CPC users' club magazine? Or are you wondering why it is sitting next to a 6128? Well, I know it is a tenuous link, but this month's issue carries a MIDI review, right? And one of the units is made by a company called... CHEETAH, geddit now? No? Oh please yourselves then.

**KAYDOR SPECIALS**

If you have all ready flicked through this month's Fair Comment you will see the extraordinary lengths that some people are prepared to go to in order to keep the dust settling under the keyboard of their Arnolds.

Why do they attempt to suffocate their little computer with cling film? Well I guess it must be because they

think that especially designed covers would cost too much.

You know the ones, you must have seen them advertised. Not the dust covers that you fling over the top of your best friend before when you are not tapping his keys, no these are the soft moulded plastic things that fit over the top of the keys and stay there. You actually type the keys with this cover in place and all the time it is preventing dust, hair, coffee and biscuit crumbs from dropping between the keys.

Anyway the point is that WACCI can now sell you these "Seal 'n' Type" covers for £7.95 which is cheaper than you can get them elsewhere.

If you really concerned about dust making your micro mucky WACCI is also selling Kaydor's dust covers for £6.50. These are the things that you tuck your Arnold up in at bed-time.

And if you want to go the whole hog and stop grime clinging to the VDU

screen and at the same time cutting down on reflected glare, you can buy a VDU screen for a measly £12.

#### THE FSW LIBRARY

This month has been an amazing one for new additions.

#### THANK-U-DWERRY-MUCH

Paul Dwerryhouse has written a very impressive little word processor called WACCI WORD 48K. It is very fast even though it has been written in Basic. The author himself has described it as "a text editor" but I have yet to see a text editor that can word-wrap, right, centre and left justify, line insert/deletes, copy text blocks, allow embedded printer control codes etc etc.

It can hold up to four pages of text in memory at once, not unreasonable. But it makes no use of the 6128's extra banked RAM, so here is an opportunity for those of you who love

to take a program and tweak it around to add some bells and whistles.

#### INGVEN 17K

Norman Buxton has come out of hiding and donated a neat little program for The FSW Library. It is an invoice generator.

Even if you don't have anybody to send an invoice to, it is still worth getting this one out of the library to see the clever little

programming tricks Norman has used (I didn't know

**SUPPORT  
YOUR  
CLUB**

**PLEASE  
MENTION  
WACCI  
WHEN  
REPLYING  
TO  
ADVERTS**

about CHR\$(11) doing a vertical tab on the printer, did you? Oh, OK then, you did.)

#### KEYBOARD 10K AND GRAFPLLOT 4K

Are two nice little programs from John Valentine. I'll leave you to work out what they might do but take my word that they do it very well.

#### EZMUSIC 14K

Pronounced eee-zee-music this is yet another innovative offering from Alastair (have you eaten your porridge yet?) Scott. Instead of having to reach for the User Guide for frequency and tone values every time you want to write a tune, this program allows you to enter notes as strings eg C D E F G A B etc. There is a stunning little audio-visual demonstration file which... well I'm not saying but it has something to do with last months birthday celebrations. Nuff said? OK.

The package comes complete with the assembly listing to allow you you tinker around and customise it.

#### DON'T FORGET

The special offer on ROM software is still available. The two packs are a great way of entering the domain of

**T HOMPSON  
C OMPUTERS**

are pleased to announce the release of

**stock control**

a routine for CP/M+ Protext

This will allow you to details of stock, print details, print re-order lists, select stock by groups, update stock levels, edit stock details and work out the value of stock held.

**all this for only £15**

**PLEASE ADD £1.50 P&P**

Cheque to THOMPSON COMPUTERS, SAE for details.

**THOMPSON COMPUTERS**  
8 Hyholmes, Bretton  
Peterborough PE3 8LG

ROM software at a very much reduced outlay. If you have ever contemplated buying a ROM box and filling it up with goodies then cast your beady eyes over these prices.

**ROM SPECIAL OFFER 1.**

Rombo Rom Board ..... £27.00  
 Protect Rom ..... £31.00  
 Prospell Rom ..... £27.25

WACCI Price ..... £79.95

Saving £5.30

**ROM SPECIAL OFFER 2.**

Rombo Rom Board ..... £27.00  
 Protect Rom ..... £31.00  
 Prospell Rom ..... £27.25  
 Promerge Plus Rom ..... £27.25

WACCI Price .... £99.95

Save £12.55

Library. This is a program which sets your CPC6128 as a bulletin board.

Ordinarily if you obtained your copy of this software from any another source you would have to assemble it and configure it for your computer yourself. Keith has saved you all that messing around and the program is ready to plug in and run.

One point to note before you take pen to paper and order a copy for yourself is that you MUST have a modem on-line with your computer because XRAS is a clever little beggar and

if it gets wind of the fact that you have no intention whatsoever of

letting it talk to the outside world it simply shuts up shop and refuses to play ball with you. If you are interested in setting up a BB this is an excellent purchase. It comes with dummy files and a comprehensive telephone help line network.

**NEXT MONTH**

Peter Ceresole shows you how to have fun with Arnor's word processor in "Playing with Protect." There will be the full review of Thompson Computer's brilliant "Simple Accounts Routine" and hopefully we will have the first look at their "Stock Control" package. Graduate Software's CP/M+ ROMs review will finally get printed. That's all from me for this month, see you in December.

**THOMPSON  
COMPUTERS  
PRESENT...**

**\*\*\* NEW \*\*\***

**Simple accounts for CP/M Protect**

This is written using the mail merge commands of Protect and is designed for the small business using single entry book keeping. This will keep records of Credits, Debits and Vat details; Print out your monthly statements and Vat lists.  
 (Requires full version of CP/M+ Protect)

**\*\* Only £15.00 \*\***

**PLEASE ADD £1.50 P&P**

Cheque to THOMPSON COMPUTERS, SAE for details.

**THOMPSON COMPUTERS**  
 8 Hycholmes, Bretton  
 Peterborough PE3 8LG

**XRAS 160K**

That man Keith Pomfret has been doing sterling service again and provided a working copy of XRAS for The FSW

**RIBBON RE-INKING SERVICE**



**WACCI  
SEAL OF  
APPROVAL**

**RE-INK YOUR RIBBONS AT HOME**

Amstrad DMP and other sponge based ribbons: Ink kit £8.00  
 Continuous loop impregnated ribbons: Hand Inker £59.50

And we continue to offer our mail order re-ink service.  
**INTRODUCTORY OFFER: £1.45 per ribbon (any make post free)**

Send order for kit or machine or ribbons for re-inking with crossed cheque or P.O. payable to ALLADINK, to:

**ALLADINK (deptXXX)**

**FREEPOST, EYEMOUTH, TD14 5BA.**

**NO STAMPS REQUIRED**                      **TELE: 06907 50965**

# FAIR COMMENT

FAIR COMMENT  
59 THE GREEN, TWICKENHAM  
MIDDLESEX TW2 5TU

## NUMBER 1

I have received my October issue of WACCI, many happy returns. However, it appears to be minus the disc software, as shown on the cover. I am sure this is a minor oversight on your behalf.

(name withheld)  
South Humberside

## NUMBER 2

Thank you for my first copy of WACCI. It looks good and I look forward to many more. One thing though, is the lack of a free second birthday disc with my October issue. I really would like a copy of this, or are us foreign types not entitled to the free cover type gifts? We certainly get the tapes on the other mags each Christmas. Please send me one soon. Regards from the end of the earth, underneath.

(name withheld)  
New Zealand

## NUMBER 3

After receiving my copy of WACCI 17 days late, on its second birthday to boot, not only was the envelope opened but, to my dismay, my birthday gift of a free disc was missing.

I know the postman is a bit of a suspicious character and my neighbours are not all they should be but what good is my free disc to them?

So Ed if I send you another cheque for £1 will you send me my free birthday gift and still keep me as a member of your wonderful club? Yours tearfully.

(name withheld)  
Leeds

<<Go on be honest, how many others of you were fooled by the "free gift" gag? Come on, own up, nobody else is looking except me. Yes that's better I thought so. There were a lot of you. Not everyone wrote a letter but a lot of you phoned up, didn't you.

Don't worry Number 3, no need to dash down to your bank, your cheque has not been cashed, nor will it be. Instead it has taken pride of place upon my noticeboard. If I get the time I might even get it framed. -Ed.>>

## ALADINKSANE

As you can see, I have re-inked my printer ribbon using the £8 Aladink kit. in the process of doing so I think I have discovered a new game.

I claim a new high score of 12 objects, other than the ribbon, to be covered in ink. These include my nose, the dog and next door's garden shed. Please bring the Mad Moonies Club so I can have this officially registered.

Alastair Scott  
Grangemouth

<<The garden shed? -Ed.>>

## PAGE THE ORACLE

Are there any WACCI members out there who know of any Public Domain Software for astrology, palmistry, I-Ching or anything similar?

I would also like to hear of anyone who has used such software, Public Domain or commercial.

D. Lancaster  
Leeds

<<Peering into my one of my crystal balls I see that a tall dark company called ASTROCALC produce astrology, graphology and I Ching commercial programs for the CPC range.

Try giving them a call on 0442 51809 or write to 67 Peascroft Road, Hemel Hempstead, Herts HP3 8ER. -Ed.>>

## DEAR EVERYONE

I had been thinking for some time as to the exact purpose of home computers, and (unfortunately) John Ridge's column made me come to the conclusion that there wasn't one.

It occurred to me that all us WACCI-ites have a phenomenal amount of computer software and hardware knowledge trapped in our collective heads, just waiting for something useful to do with it.

Then I saw a news article about a machine that could read text, and convert it to speech for blind people. That in my opinion, is a good use for computers.

There must some similar project that we could undertake. Take speech synthesis for example: it would not be very difficult for us to design and build a simple device to allow people with speech impediments to talk. Software that allowed blind people to do word-processing is only a matter of programming.

I'm sure there are many other opportunities to make use of our skills, if we only tried. Anyone out there have any opinions?

John Kennedy  
Bangor

## TEXT TO SCREEN

Concerning Phil Morely's (September's Fair Comment) question about loading text files into The Advanced Art Studio package.

If you can load the file so it is viewed on the screen (the original must be saved as an ASCII file) there are various programs that emulate CP/M's "TYPE" command, which will allow you to do this (Utopia has such a utility.) Then, when it is on the screen, simply save the screen using SAVE"filename"+"scr",b,&C000. The file you have saved can now be loaded into AAS. For example (using Utopia) enter this as a direct command :-

```
MODE ?::LIST"file":SAVE"file"+"scr"
```

It is very important that you issue the relevant MODE command first.

I am having some difficulty with

understanding the printer control entry method in Protex (ROM). I have an Amstrad DMP3000. The printer manual tells me that I have to send CHR\$s and letters to the printer to select type faces but the printer control option in Protex only asks for a letter. Uh? What do I do?

John Hilton  
Bristol

<<Thanks for the pointers John but I found that I couldn't get your example to work until I modified it slightly. I had to type in a direct command as one line of:-

```
MODE ?::LIST, "file":Save"file.scr",b,
&C000,&4000
```

Don't worry about sending CHR\$s to the printer when you are using Protex. Those nice men at Arnor have made all that printing stuff easy by including a set of control codes ready built-in to Protex. Type SP from the command mode if you want to view which ones are there.

For example, say you want to have a line of text in italics. Place the cursor at the start of the line and type CTRL (^) and x followed by i. You will see an inverse i appear which signifies that an embedded control code to turn on the italics has been placed at that point. Repeat the operation at the end of the line and try printing out the text.

If you need additional codes you can use the spare control letters to define them and then save them as a separate printer driver file.

If you want the ultimate guide, to help you to use Protex, have a look at Playing with Protex next month, by Peter Ceresole -Ed.>>

#### HEAVENS ABOVE

Re: The letter from the Rev Armstrong (WACCI 20) about the problems caused by dirt getting under the keys and causing them to stick. A possible solution is to cover the keyboard with cling film.

Place the film loosely over the keyboard and secure it with masking

tape. Remember that it is vitally important not to block the ventilation slots at the back. I don't know how much use it will take, but it is cheap and easy to replace and it should prevent dust and crumbs from lodging in-between the keys.

Hugh Watt  
Scunthorpe

<<What is the good of keeping crumbs from getting in-between the keys? After formatting a couple of chocolate digestives I need to keep them out of my disc-drive.

Never let it be said that I have a closed mind. Yesterday I sat down with a sheet of cling film over my key board and tried to type some of these letters in. Results:-

a) If the cling film is loose it reflects so much light that you can't see the keys.

b) If the cling film is drawn tight it produces a typing sensation I have not experienced since my ZX81 days.

Never let it be said that I am unsympathetic to those of you who have a tendency to munch your lunch whilst on the keyboard. See this month's Thank You and Stuff for news of big discounts on KAYDOR Seal 'n' Type keyboard covers, dust covers and VDU screens -Ed.>>

#### A PASSING SORT

After reading the article by John Ridge on "Sorting" and Thomas Hardman's article on "Sound" in the September issue of WACCI, I thought I would send you a couple of my programs which you might like to use as listings in the magazine.

The first one I have called "Allsorts" and it, graphically, illustrates four different sorting routines and their method of comparing numbers. The computer selects ten random numbers between 1-999 and places them in order using the four routines. There is a timer which increments in seconds to compare the speed of the sorts.

The second program is called "Sounds Amazing" and is a useful utility for creating sound effects. The program asks for input for the different

parameters of the sound command which it then prints on the screen. After pressing the space bar the sound is generated and the volume envelope and tone envelope (if specified) are printed. If you like the sound that is made, simply take note of the numbers on the screen.

Willie Lawrie  
Perth

<<Thanks for the programs Willie, I've put them in The FSW Library because they are too long to go in the mag as type-ins -Ed.>>

FAIR COMMENT  
59 THE GREEN  
TWICKENHAM  
MIDDLESEX

#### A BEGGING LETTER

Being interested in graphics etc. I purchased a Vidi Digitiser a few months ago and since then I have stored about thirty good images to disc. What I want to do now is display each of them in sequence on the screen for about one minute.

As my programming ability, on a scale of one to ten, rates about zero I'm looking for a program or programs that would do this for me. Has anyone out there written any programs that would fit the bill? If you have produced this type of program perhaps it would be a good idea if you were to donate it to the Public Domain. Alternatively I will dig into my enormous (only joking) wallet.

Peter Campbell  
Glasgow

<<OK open your wallet wide and donate a hefty wedge to "The Steve Williams Libation Liberation Fund." Here is the information you require.

If you are using a 3" disc you will be able to get a maximum of ten screen files on each side. So pick out your ten favourites and stick them onto one side of a new disc using a CP/M+ utility such as PIP, NEWSWEEP or MFT or Utopia's COPY command.

Rename the files with either

Utopia's or CP/Ms *RENAME* utility from filename.scr to 1.SCR, 2.SCR etc so that you have a disc with ten screen files labelled 1.SCR to 10.SCR. Now type in this program, save it on the same side and then run it.

```
10 x=1
20 b$=".scr"
30 MODE 2:INK 1,25
40 a$=STR$(x)
50 c$=a$+b$
60 LOAD c$,&C000
70 CALL &bb06
80 x=x+1
90 IF x=11 THEN x=1
100 GOTO 40
```

(Change line 30 according to the Mode the screens have been saved in. Line 70 can be removed if you want.)

The first screen will now load in and sit there until you press a key. It will then load in the next file. If you want it to load the next screen automatically, after waiting for a minute, then you are going to have to dig out your manual and do a bit of homework yourself. Look up the keyword *TIME* on page 3.85 of the manual and work through the example. -Ed.>>

TO ADVERTISE IN WACCI  
RING (01) 898-1090

#### IMPATIENT FROM NEWCASTLE

Thank you for another mega brill issue of WACCI, September 1988 but where is the October issue? I am getting bored reading all the WACCI back issues, Amstrad Computer User is no good and CPC Computing is getting worse by the month. WACCI and Amstrad Action are the only ones I look forward to each month.

Layaqat Ali  
Newcastle-upon-Tyne

<<Sorry to keep you hanging around for your October issue Layaqat but the postal strike delayed its production by a week -Ed.>>

#### PLUG-A-LUG

Thank you for a great magazine, one that provides a humorous yet informative read.

Hopefully (when I get some time) I will be contributing some homegrown software but at present I am still wading my way through the JRT Pascal manual. The manual itself took a week to edit and print. One thing I have discovered though, is that a second drive is pretty essential. So has anyone has any cheap second-hand disc drives they are willing to sell?

Also, I was wondering if anyone is interested in buying the Siren speakers and amplifiers with Ultrasound to bring their Straddles into the world of stereo. The price is £25 fully inclusive.

On the same subject, how do you connect Straddles to an external hi-fi system? Please could you explain in terms of which plugs are necessary and where to plug them in on the hi-fi?

John Sholicar  
Cheltenham

<<Nice one John. I make that one plea and two plugs in the same letter. With regard to the last plug, to connect your Amstrad to a hi-fi you will need a special ready-made lead costing around £5-7 (ish). One end of it will need to have a stereo 2mm sub-miniature jack plug which fits into the stereo socket in front of the joystick port and the plug at the other end will depend on what set up your hi-fi has.

Most systems have a 5 pin din plug input some use phono plugs. Whichever is used, there will probably be some marking like "external input" or "phono in" at the back of the unit.

If in doubt, nip down to your local hi-fi shop and ask the man behind the counter -Ed.>>

#### CHESS BORED

I typed in Scotty's P-K4. I have sat for hours trying to cover the board but I never managed it. I was thinking that it couldn't be done but now I know different.

I also liked the review of Robert Baxter's music programs. I have the "Short Works" and it is excellent. I only wish I could afford the "AMS." I would send for the other works by Bob but my pension doesn't allow for such luxuries.

Well, keep up the good work. I hope you get the helper you want.

M.J. Menzies  
Devon

FAIR COMMENT  
59 THE GREEN, TWICKENHAM  
MIDDLESEX TW2 5TU

#### ASSEMBLING ASSEMBLERS

I don't know if I am alone in this but I have gone out and bought a couple of assemblers (ADAM and the one that comes with the Amstrad Assembly Course) and a couple of books.

I am a bit reluctant to make any further outlay (to get Maxam) until I am sure that I really want to get into assembly language. Being able to follow some of the magazines' assembly language course would help but they all seem to give listings which I can't assemble.

Perhaps your magazine could give readers some guidance in adapting Maxam listings for other assemblers. This guidance needn't be written by someone who knows all the other assemblers. What is needed is guidance about what the various items in a Maxam listing do so that we can look up the corresponding things in another assembler's manual. (e.g. what sort of thing is "kl\_init\_event"; what sort of thing is "add\_ticker"; how do they differ etc.?)

James Brown  
N. Ireland

<<Yes it is a fact that all machine code listings in magazines seem to have been produced for MAXAM based assemblers. I wonder why? Could it be that MAXAM (1,2 and 1.5) is the best assembler for the CPC on the market or that it is used by more CPC m/c dabblers than any other assembler



available? If this is the case then you are swimming against the tide a bit by staying with your present ones.

Common now, have a think about this. MAXAM on disc costs the equivalent of about 1.5 games on disc but for that small price you will be able to type in all those listings "as is" without having to translate them first.

Take my advice and sell the other two assemblers and buy yourself MAXAM. In the meantime have a look at this months "Basic Machine Code." Alex Aird has written a section about assembler conventions.

As for kl\_init\_event and others, these are just labels made up by the programmer to help him/her remember what particular routines are intended to do -Ed.>>

#### BRUNWHAT?

I wonder if you can advise me on a matter concerning some software which I am thinking of purchasing from you. I am tempted to buy the ROM version of Protext along with the Prospell ROM and a ROM box. Does Protext have a dual screen mode similar to Brunword, which I use at the moment?

With Brunword you have the choice of 40 or 80 columns of text. As I am partially sighted I tend to use the 40 columns on screen and then switch to 80 for final editing and it does of course print out in 80. I would be grateful if you could give me this information as I would hate to spend that amount of money on software which I could not use.

Peter Hubbard  
London

<<Yes, there is definitely no fear about wasting money, Protext does have a 40 column display mode.

All you have to do is type in "MODE 1" from the command mode and you have the text in large form. Typing in "MODE 2" reverts it back to its familiar squinting size -Ed.>>

TO ADVERTISE IN WACCI  
RING (01) 898-1090

#### DISC-O-TECH

Thanks for the prompt return of my software order. Shame the P... Office took three weeks to deliver it. Ever thought of using a carrier pigeon? It might be quicker (and cheaper) than good ol' Postman Pratt.

The software was, however, well worth the wait and the money. The C/PM (yawn) Sideways program has been especially useful. The only problem is that you have to go into C/PM to use it, a pain if there is only one file to be printed. Does anyone know of a non-C/PM Sideways printing program?

Surely one of the programming contributors to WACCI could easily write something like this.

Next, advice please. I own a CPC464 with the following stuck on the back: 64K memory, 64K Silicon Disc, DDI and Rombox with four ROMs.

Can someone, who knows about these romboard things, please explain why:-

Firstly, on using the help command of Utopia, Basic is allocated to slots zero and six. I know, or thought I knew, that Basic takes slot zero but why six as well? Does this mean I can't use this slot for a further ROM?

Secondly, why does the silicon disc take up slot four?

Lastly, is there a reasonably priced graphics program (pie charts, histograms and stuff like that) that anybody knows of?

John Thain  
West Bromwich

<<I don't know why you are getting Basic showing up in slot six, mainly because you haven't told me exactly which ROMs you have and what order they are installed in.

It is my guess that you are not using Utopia to map out the ROMs (shame on you.) With some ROM mapping utilities, in certain (but not all) circumstances they can report that all the empty slots are carrying Basic in them. It doesn't matter if you then put something else in one of these vacant slots, the utility just reports the presence of the new ROM instead.

This quirk is called a "feature" of the utility. Ignore it and use slot six anyway.

The silicon disc operating system board is a one socket ROM board, in the same way that each socket in the Rombo is itself one socket, physically located to its number and it cannot be any other number. As with all ROM sockets it has to be located to its slot number by physical wiring or hardware. It just so happens that DKTronics chose to use slot four. It could have been any number.

Not sure about a cheap, useful graphics package. In my experience the two terms are mutually exclusive. I use Office Mate from Gemini Marketing Ltd. I has an excellent graphics section, but I am not sure if it is still available for the CPC -Ed.>>

#### GENTLE REMINDER

While eagerly awaiting my October issue of WACCI I suddenly thought about the postal strike and I said to my three dogs and cat, (we live alone when the wire is working,) "I bet it's late this month." So I went into my den to investigate and the animals stayed by the fire.

To cut a long story short I found, by looking in one of my very untidy files, that my subs had run out. Then I remembered about a letter I had read somewhere.

This letter was in the March WACCI 1988 Vol.3 no. 3. From Stephen Brown who quoted that he had been waiting for his copy of WACCI.

The reply from the then editor (old what's his name?) was a claim that when your subs run out, a reminder would automatically be printed on the address label of the envelope. Now I know "old thingy" has moved on (to better things?) and I realise that you may not be aware of this but can you imagine what my wallpaper in my den looks like without my October issue?

D. Smith  
Leeds

<<Yup, ol' nolegs' system is still in operation and still having much the same effect. When a subscription expires a reminder, "your subscription expires with this issue," gets printed on the label and is usually ignored by

the reader. Then six weeks later I get a panic phone call or letter asking why WACCI hasn't arrived.

So as a general rule: If you don't receive a copy of WACCI for nine months it is a fair bet to assume that your subscription has run out -Ed.>>

#### COBOL HELP

You've probably guessed. Yes I received the second birthday edition of WACCI today. I must admit you even had me fooled this time though the idea of a free disc of programs, on the front of WACCI, was a bit far fetched owing to the cost.

The reading of the description on page two was very suspect but the fact that my WACCI always arrives in an unsealed envelope made it possible that it may have fallen out and become prey to Postman Pratt's service. Anyway enough of all that.

Will you please put my address in your already overcrowded pages of your wonderful fanzine with the following request?

#### HELP NEEDED WITH CPM-057 COBOL.

*Can anyone give me a step by step idiot's guide? I am taking a course in COBOL and need to practice my listings before sending them off for examination. If I pass I'll return your kindness with a series of COBOL articles.*

M. Madden  
1 SQN  
13 Sigregt  
BFPO 42

#### HAPPY MEMORIES

As I implied in the "Silicon Memories" article (WACCI 23) on changing a DKtronics/RAM silicon disc to a memory expansion, I had neither silicon disc nor memory expansion to study.

Since then I have obtained a silicon disc and I have performed the operation and I am pleased to tell you that it worked. Now I can change from one to the other by changing some links that I fitted.

However, I think I should point out

that the operation will not work if a memory expansion is changed to a silicon disc. The reason is that the silicon disc comes with a separate box which contains the ROM software required to run it. Without this, or some other suitable software, it would be pointless making the alteration.

The ROM box's PCB has the words "Light Pen" printed on it, and also has some links, one of which is cut. I am now chasing up all the possibilities which this product offers and I should shortly have a follow up article ready for you.

By the way, I recently read a news report that Squinty had been spotted in Rio with Fiona. Is this true?

Phil Craven  
Bradford

<<'Tis a wicked lie Phil, last I heard they were sailing off Bermuda -Ed.>>

#### SO IT'S GOODBYE FROM ME...

I have done a terrible thing. I have sold my 6128 and bought an Amstrad 1640 ECD. So I am writing to say that I will not be renewing my membership with WACCI.

I have been in WACCI since Jeff put that first letter in Popular Computing Weekly and have greatly enjoyed all that has been on offer. I am afraid that I have offered nothing to the group. I am very much a user of computers and not a computer buff as such, but I really have appreciated all the FSW and other benefits of belonging to WACCI.

Please pass on all these comments (or this letter) to Jeff.

The chap to whom I sold the 6128 has now (at my recommendation) joined WACCI. Many thanks and all the best for a long future.

Brian Anderson  
Bromsgrove

<<How can you say that you have offered nothing to the club? Right from the beginning you coughed up the dosh up front and subscribed.

For two years and read the mag, you bought loadssa FSW (which helps subsidise the club) and when it came

time, to move on, you got us another member to take your place. What more could we ask?

Even if there were such a thing as a passive user, where's the shame in that? If there weren't users out there then the contributors would have no audience to write software and articles for -Ed.>>

#### ...AND IT'S GOODBYE FROM HIM.

I am sorry to say that I shall not be renewing my subs for the coming year. This is no reflection on WACCI or the magazine but I do not have a disc drive, while it seems that most of the other members do. Increasingly it seems that the information and articles are directed towards disc users. Now that the FSW is no longer available on tape I am finding very little of interest.

Clive Blackmore  
Stroud

<<So long Clive and thanx for staying with us for so long. Yes discs are becoming more commonly used by CPC464 users. It is not the case that WACCI is deliberately directing information towards disc users, more that fewer and fewer members are still left with tape-only systems.

It's only the same reason that there are no longer any ZX81 mags available on the magazine racks -Ed.>>

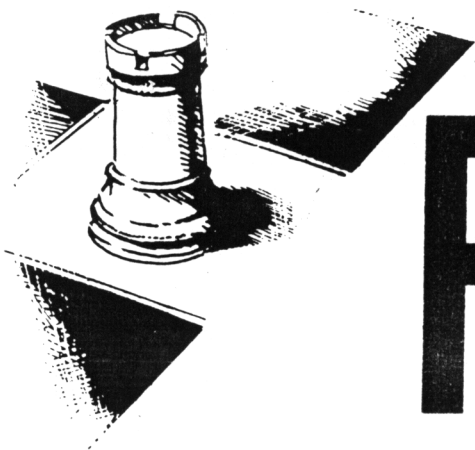
FAIR COMMENT  
59 THE GREEN  
TWICKENHAM  
MIDDLESEX

#### DIGESTIVE COMPATABILITY

I have recently bought a disc-drive for my CPC464. Will all the programs I buy on disc run on my set-up.

Steven Taylor  
Eastbourne

<<The ones that will only work on a 6128 or upgraded CPC should have this fact clearly marked somewhere on the box or in the title e.g. MasterCalc 128 is self-explanatory -Ed.>>



# P-K4



Alastair Scott  
30 Talbot St.  
Grangemouth  
FK3 8HU

ARGHH I'VE RUN OUT OF JOKES ABOUT CHESS

Congratulations to Alex Balfour of Stoke Poges who sent in the first correct answer to the competition in issue 24. He showed, using a program written in Hisoft C, that a probable upper bound to the number of Knight's Tours is:

117, 821, 455, 143, 639, 376, 008, 480,  
095, 841, 926, 943, 859, 058, 977, 920.

Using my program, which makes one Knight's Tour every 23.8 seconds, it would take roughly  $10^{41}$  years, assuming no repetitions, to work them all out; the Universe is a trifling 18 or so billion years old and the Sun has just five billion years to go before it becomes a red giant and engulfs the Earth.

ooo000ooo

As a follow-up to my last article, I will try and answer a question which you may be asking with Christmas so close: "Is it worth buying a chess computer?" Here's a list which you should find useful.

## CPC CHESS PROGRAM (COLOSSUS CHESS 4)

**PROS:** Cheap (£14.95 disc).

*Very flexible, with an infinite number of skill levels.*

*Can save games to disc.*

*One of the strongest computer chess programs.*

*Excellent end game player.*

**CONS:** Small opening book (1,900 moves).

*Slow, and unfortunately prone to oversights.*

*Difficult to play directly from monitor screen.*

*Entering moves is unavoidably awkward.*

*Inexplicably, game scores cannot be printed out.*

*Obviously not portable.*

## DEDICATED CHESS COMPUTER (FIDELITY DESIGNER EXCELLENCE)

**PROS:** *Looks good.*

*Very fast - can spot mates in four instantly.*

*Enormous opening book (12,000 moves).*

*Again, excellent at end games.*

*Easy to use with pressure sensitive board.*

*Very portable; mains or battery operated.*

*Has advertised Elo grade of 2000.*

**CONS:** *Expensive (£150).*

*Only twelve skill levels.*

*Limited I/O (four digit LCD, eight buttons and LEDs on board).*

*Consequently, setting up positions etc. is difficult.*

*Games you wish to keep must be notated by hand.*

*Eats batteries - mains adaptor is £10 extra.*

The most important feature is the playing strength. I would suggest that players with Elo grades up to 1550 who aren't bothered about carrying a computer about in their briefcase (or whatever) would find Colossus adequate; everyone else would be advised to buy a chess computer.

One thing you should be careful not to do is buy a computer, at great expense, which repeatedly thrashes you at the lower levels. For example, beginners would find one of the small pocket-sized computers with plug-in pieces (£30-50) perfectly adequate and would be wasting their money buying, for example, a Fidelity Designer Excellence (£150). This is especially relevant as many retailers have good part-exchange facilities if you do decide to upgrade.

The same thing happened with myself; my Elo grade is 1670, and I had the choice between buying a 2000-graded, Z80-based computer at £150 or a 2200-graded, 68000-based computer at £400. The cheaper one won.

*Next month - Designer Excellence versus the CPC chess programs. See you then.*

PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ...  
PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ...  
PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ...  
PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ...  
PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ... PROPERGANDER ...

STEPHEN "SCOOP" GRAINGER AIDED BY STEVE "WACCI" WILLIAMS ARE HOT ON THE NEWS AND GOSSIP TRAIL.

### ON THE UP AND UP

Alan Sugar is not a man easily remembered for his winning smile or sparkling wit.

Some of the more unkind observers have even been heard to remark that he always appears to be a miserable person (no not us, honest.)



AMS trying a smile?

Perhaps his companys latest trading figures will help change all that and put the smile back on his face.

Amstrad PLC has announced that in the year to June 30th its computer and consumer electronics group increased pre-tax profits by 18.2% to £160.4 million on an increased turnover of £625.4 million, 18.2%.

Last year the company sold a tidy 1.4 million computers and the leading lights in this success story were the PCW and PC range of computers. Together they now account for 51.4% of Amstrad's revenues.

Printer sales were also up from a 4.4% share of the total to 5.1% after selling 250,000 units.

The bad news is that sales of the Sinclair range (this includes the CPC range now) of home computers were down by £25 million.

### CALLING ALL STUDENTS

In a new scheme jointly co-ordinated by the National Union of Students (NUS) and the Midland Bank loans

will be made to students wishing to buy computer equipment.

The scheme, called Futures, will allow any student (not only those following a computer related course) to borrow up to £1000, providing they purchase the equipment of the NUS subsidiary, NUS Services.

At present the machines on offer include mainly Amstrads, in particular the PCW 8256, the PPC 512, the PC 1512 and the PC 1640, as well as the Citizen 1200 printer.

The loan is charged at 1% above the Midland base rate while you are at college during which time you won't be expected to pay off too much of the loan (about a fiver a month on average). When (or if) you get your qualifications you will be asked to repay the balance, which will then be charged at 3% above the base rate, within two years.

So if you fancy a shiny new computer for Christmas, get down to your local Midland Bank and ask for details, alternatively go and see your NUS representative (who should be located in your students Union building) who will be only too happy to talk to you (mainly because nobody else will.)

### OUR PRICE SOFTWARE?

Following the announcement that Woolworths were to start stocking computer software (see last months ProperGander), the giant music chain, Our Price Records look set to follow Woolies into the land of digital data and arcade rip-offs.

The move follows Our Price's buy out of Richard Branson's Virgin Mega stores which already sold software and will continue to do so for the foreseeable future due to the fact that a Virgin store is about twice

the size of the Our Price equivalent.

However, the Our Price shops in Durham, Oxford and Portsmouth are running a feasibility study on how well software sell from its branches. If the results are encouraging then it is possible that within the next few months the majority of Our Price's nationwide could be selling software for all the major micros, including the CPC.

### FREESCAPE FOR U.S.

Incentive Software have finally (and deservedly) found an distributor for their Freescape range of products. They have signed the exclusive distribution deal with Epyx software.

Driller, the first game that will be sold under the deal, has already received back orders worth over half a million dollars, and it is expected that this type of game will be even more widely acclaimed in America than it was in Britain.

Andy Tait, Sales Director for Incentive, put it simply "Epyx is one of the biggest US Publishers, and we are delighted to sign with them".

### CAREY JOKE GENERATOR

The Americans, never one to miss an opportunity have finally invented a program that will make jokes that are funnier than those found in a sit-com (although personally, compared to the average American sit-com, I find spread sheets funny).

Rather than simply being a list of stored up jokes, The Humour processor as it is called, actually generates its own (most of which are as funny as the manual) which can

then be used in slugging off opposition politicians etc. Also supplied with the package is a manual explaining how to tell a joke - so even George Bush can use it.

However, attempts to get Glenn Carey to endorse the product were thwarted because his management claim that there is more money in football simulations. This is the reason many believe that the product has not yet found a UK distributor.

### **E.A. SIGNINGS**

Two of Europe's big software houses, Dinamic and Ubi soft, have agreed to sign an exclusive contract with Electronic Arts to distribute their games throughout Great Britain and Eire, and in the case of Dinamic, throughout most of the rest of Europe too.

Dinamic is the top Spanish software house, and already has several titles under its belt such as Game Over and Army Moves which were both distributed in this country by Imagine. The fact that EA managed to lure the Spaniards away from Imagine is itself a bit of a coup.

EA will be handling the distribution of Dinamic's future titles in all European countries except Spain, Portugal and Italy. The first game to be sold via them was Game Over II which should have been launched at the PC show (barring any mishaps.)

Michel Angstadt, Director of International Operations for Dinamic said this of the deal "After looking closely at the European market-place and talking to a number of software publishers we chose to work with Electronic Arts. Dinamic also sells direct to the retailer in Spain, via Drosoft, and sees this as the most effective means of distribution."

Ubi soft, a major French software developer, are part of the Guillemot group. It was formed two years ago to specialise in games and as such has become one of the biggest French software houses.

They have already tried to make their mark on the British market

about a year ago. That time they also tried to do their own distribution but failed to do anything spectacular.

The contract means that EA are to handle sales and distribution of all of Ubi soft's forthcoming titles. The three already scheduled for release on the CPC are Iron Lord, Skateball, and Puffys Saga.

Yves Guillemot, President of Ubi Soft, claimed "We are delighted to have Electronic Arts distribute our products in the UK. They have shown themselves to be a major force in the UK market over the past year which attests to the strength of its distribution. In Addition we have already established a good working relationship with them while distributing their products in France."

Mark Lewis, Director of European Publishing for Electronic Arts said of the two companies "We are delighted to have signed both Dinamic and Ubi Soft as affiliated labels."

On the subject of Dinamic he claimed "We were attracted to the professionalism Dinamic has shown both in the quality of its products and by the high standard of its marketing."

As for Ubi soft, "We feel its products will compliment others within the Electronic Arts Distribution Umbrella. Ubi Soft's products are of a high quality and perfectly suited to the UK market." and added "We are looking forward to working towards chart success with these titles."

### **FISHING FOR CHIPS**

Those of us with our ears to the ground will all ready be aware of shocking rumours concerning Alan Sugar's culinary habits.

For a long time a story has been circulating that, despite his immense wealth, he reverts to his humble origins every weekend.

It is rumoured that when Mr Sugar is "in residence" at Brentwood Palace on a Saturday night, he sends the Roller down to the nearest Fish

and Chip shop to purchase some of the greasy comestibles.



Now comes the news that Amstrad PLC has invested £45m to purchase a 9% stake the US company, Micron Technology. MT is one of the biggest chip suppliers to be found outside of Japan.

Can it be that he liked the product so much that he bought the company? or hasn't he realised that MT only produce the silicon variety of humble chip and not his favourite evening nibble?

In September, at the launch of the PC2000, Alan Sugar admitted that his company now requires 5.5 million draws a month but currently can only acquire 3.5 million of this number.

Jim Beveridge, the Director of European semiconductor research at market research company Dataquest, says, "This is a good move for Amstrad. When the market picks up, suppliers tend to supply their strategic customers. Amstrad has made sure that it is one of Micron's most strategic customers because it partially owns it."

The investment ensures Amstrad 9% of MT's dram output for three years starting from January 1989. In August MT announced it intended to double its dram output over the next two years.

The move marks a departure from Amstrad's usual strategy of avoiding links with just one supplier and trying to get the best deal from wherever it can.

Dataquest predicts a shortfall of eight million units for the 26 million units that would be required in Europe this year. SW.



AUNTIE JOHN'S DINNER TIME AND HELL'S ANGELS SPOT

As the clearing up after last month's party extravaganza continues, it is time to get down to another WACCI year, this one even more full of traditional, high-fibre, natural, no preservatives added, home-baked goodness than the last. (Errr, Steve, I can't get the free disc from last month off the cover.)

**POMME FRITTES**

But first just who is this Keith Pamphry, the amazing half-cabbage, half-Blues Brother? Are the rumours that he is a computer generated Artificial Intelligence relational database just something I made up? Why am I picking on this poor soul? Is rhetoric over-rated?

**CELESTIAL BODIES**

For those of you who were wondering, the bright reddish star-thing in the sky at night is in fact the planet Mars. The planet Mars is not to be confused with the company Mars, who make sweetsies.

It is an interesting point that the company is in fact some three to four times larger than the planet. Towards the end of September the planet came

as close to the Earth as it does for some time and it was a rather magnificent sight in a reasonably large telescope. It is still plainly visible but the casual observer might look up at the sky for a bright reddish planet and be rather disappointed. Here are a few tips to help you avoid this situation:

- \* Go outdoors first.
- \* Wait until it is dark.
- \* Wait until it is not raining and there are no clouds.
- \* Do not confuse it with Jupiter. Jupiter is not a large confectionary company but in fact a quite colossally huge planet (bigger than Tesco's even.) Jupiter is lower-down in the sky (ie nearer the ground) and a whiter-colour.
- \* Look at it, open your mouth and make "oooh" and "ahhhh" sounds.
- \* Point upwards at it and tell passers-by "That is Mars, you know."
- \* Get a sore neck and come back indoors.

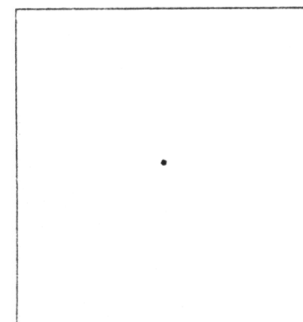


fig 1: Mars

**HENS AND MOTORBIKE MAINTENANCE**

It is a little known fact that poultry is actually completely unsuitable for tuning motorbikes. It is also a little known fact that I am completely unsuitable for tuning motorbikes.

In fact, last time I tuned one, the top of the engine casing fell off. Although you might be forgiven for thinking that the top of the engine casing is not really that important, when mine fell off it caused a large quantity of very hot engine oil to fly all over my trousers, scared a group of young children and raised my singing voice by several octaves.

The resulting reduction in oil quantity did, of course, cause a

slight change in performance and I fell off. Shortly after this I invested in a crash helmet.

**PROBLEM CORNER**

There is just enough space and time to deal with two readers letters I received last month. .

- Q. Dear Auntie John, how can I convert my Compact Disc player into a Laser Printer?  
Yours Jeff
- A. You can't.
- Q. Hey puddle-head, how can I get random numbers in machine code?  
Glenn
- A. Use the "r" register. The "r" register is used by the Z80 to control the refreshing of dynamic RAM, but can be read by the user using a simple "ld a,r" instruction. The accumulator will then contain a number that is difficult to predict. It must be realised that not every possible number occurs with equal probability - some values are many times more frequent than others.

**NEWS**

The Home Secretary today revealed his plans to reduce Britain's crime rate. At the Conservative party conference, in Brighton, Douglas Hurd explained his "mass extermination" plan which he also claimed would reduce the unemployment rate to exactly 0%.

Spock, Aching and Waternoise the well known record producers have decided to release a single featuring members of the Royal Family, Scott Robinson and Charleen Michell. "It is an entirely logical move" said Spock.

**OTHER THINGS**

I must take the time to thank, Superphil's close friend, Phil Craven who has supplied me with enough electronic hardware other the past few weeks to build a CRAY 2. So far I have got lots of little lights to light up (and very pretty they are too) but not much else. Watch this space. Or that one if you prefer, I'm not fussy.

**THE PRISONER'S DILEMMA GAME**

Ever heard of the Prisoners Dilemma Game? No, neither had I till a certain five foot psychologist, whom I am not going to mention any more, started going on about it and how difficult it was to write a thesis on it. I mentioned it to Green and he said he



remembered a Horizon TV programme about it. Anyway, the story goes like this:-

Two prisoners have been arrested on suspicion of committing an armed robbery. If neither of them confess they will receive a one year sentence for possession of firearms. If they both confess, they will receive five years for armed robbery. But, if one confesses and one does not, the prisoner who confesses will receive one month, and the other prisoner will get ten years (fig. 2).

So you see the problem? The prisoners are not allowed to communicate and so reach an agreement, they must decide to behave co-operatively or competitively, this is what the game is a test for. The game gets interesting when you play it many times and add up the total sentences, something the computer is very good at. It gets even more interesting when the game is played against a computer opponent. Several experiments have been performed in this way and the results seem to show that women are much more cooperative than men. Hmm?

What I propose is a computer against computer confrontation. Everybody writes a computer program to play the game and the winner is the program that amasses the shortest sentence total after a pre-determined number of games. Let me know what you think.

See you next month.

Your Auntie  
John.



		prisoner A	
		doesn't confess	confesses
prisoner B	doesn't confess	1 year both	1 month A 10 years B
	confesses	1 month A 10 years B	5 years both

figure 2.

# basic machine code

## PART 9 OF ALEX AIRD'S ABSOLUTE BEGINNERS GUIDE TO MACHINE CODE PROGRAMMING

*A slight error crept in the Protect Clock Basic listing in last month's column. Well it was not so much a case that an error crept in but more like a line crept out. Line 250 was missing. It should have read:- 250 NEXT.*

Last month I talked about the out command and finished with a short Basic program which manipulated the CRTC chip.

The following program combines the ideas of squashing the screen both vertically and horizontally. The screen is always 40 characters wide and 25 characters high so far as the 6845 chip is concerned. So the following program will work in any mode.

```
10 BORDER 0
20 FOR a=25 to 0 STEP -1
30 OUT &BC00,6
40 OUT &BD00,a
50 OUT &BC00,1
60 OUT &BD00,INT(a*1.6)
70 FOR delay=1 to 50:NEXT:NEXT
80 CALL &BB18:'press any key
90 FOR a=0 to 25
100 OUT &BC00,6
110 OUT &BD00,a
120 OUT &BC00,1
130 OUT &BD00,INT(a*1.6)
140 FOR delay=1 to 50:NEXT:NEXT
```

You can load a screen at line 80 instead of simply waiting for a key press. This idea is used in several commercial games.

### A BASIC PROGRAM

```
10 FOR a=25 to 0 STEP -1
20 OUT &BC00,6:OUT &BD00,a
30 FOR delay=0 to 50:NEXT delay
40 NEXT a
```

### THE MACHINE CODE EQUIVALENT

```
ld a,25
.loop
ld bc,&bc06
out (c),c
ld b,&bd
out (c),a
ld b,50
.delay
halt
djnz delay
dec a
jr nz.loop
ret
```

It may look a little strange that in machine code we use &BC06 and in Basic we use &BC00.

It is all to do with the way the z80 chip interprets the out (c),c instruction. The z80 gets the address &BC from the b register and sends the contents of the c register down the data lines.

```
ld b,&bd
out (c),a
```

and in this case the contents of the A register are sent down the data lines and although the instruction is out (c),a the C register is not really involved.

### MACHINE CODE DELAY LOOPS

The easiest way to get a short delay is to use the HALT instruction. It tells the z80 to suspend operation of the program until an interrupt occurs. Now, on the CPC computers, interrupts are happening all the time, 300 times a second in fact. So by telling the z80 to halt 300 times, you get a one second delay. In the machine code program, the delay is 1/6 of a second.

Whatever you do, DO NOT disable interrupts before using HALT. The z80 will wait forever for an interrupt that will never happen.

I will pass converting of lines 60 and 130 of the first Basic program. The calculation of INT(a\*1.6) can get rather complicated. First I shall go into shift and rotate instructions. They are:-

```
RLC Rotate Left Circular
RRC Rotate Right Circular
RL Rotate Left
RR Rotate Right
SLA Shift Left Arithmetic
SRA Shift Right Arithmetic
SRL Shift Right Logical
RLD Rotate Left Decimal
RRD Rotate Right Decimal
```

The instructions SLA, SRA and SRL are most useful in calculations. eg. to multiply by two

```
ld a,3
sla a
```

```
and a=6
```

It is easier to see when the numbers



are converted to binary .

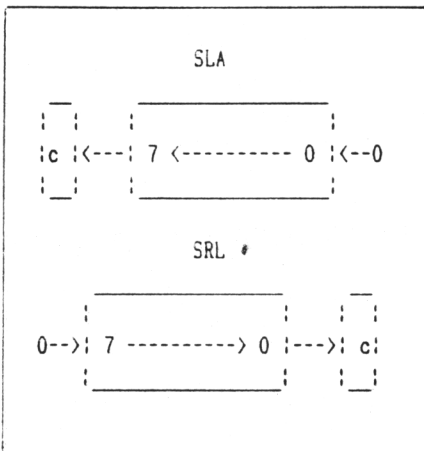
3 decimal = 0000011  
6 decimal = 0000110

To divide by two it is just as easy

```
ld a,4
srl a

and a=2
```

If you start with an odd number then you will have a remainder which is kept in the carry flag.

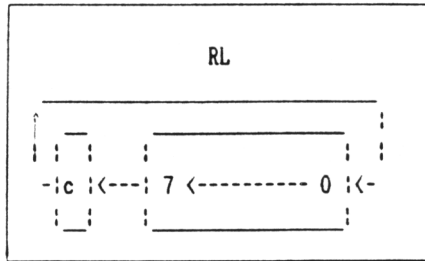
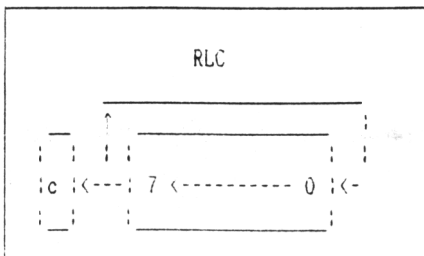


Earlier I mentioned converting the Basic line INT(a\*1.6). This is the same as INT(a\*8/5). Now a\*8 is easy. Just repeat the instruction sla three times.

Binary

```
ld a,25 ;a=25      11001
sla a ;a=50      110010
sla a ;a=100     1100100
sla a ;a=200     11001000
```

All you need to watch out for is if the answer exceeds 255. If it does then carry will be set. The difficult bit is dividing by five. More on that another time.



#### ASSEMBLER CONVENTIONS

All assemblers use their own variation of assembler language. In particular, labels are defined in different ways.

For example the firmware routine to print a character on the screen is at &BB5A so at the start of a program it is easier to write (using Maxam) something like this:

```
.print equ &bb5a
```

then when you want to print a character on the screen use call print Using Devpac write:

```
print: equ #bb5a
```

The colon and the word print upset Maxam. Other assemblers, particularly those in the public domain library, use the form:

```
print: equ 0bb5ah
```

Check your assembler manual for the correct syntax to use. Labels are also used to point to a routine. In Basic you might have a subroutine at line number 1000 and to use it you would write GOSUB 1000. In assembly language there is no line numbers, only labels. The equivalent of GOSUB is CALL, and as there are no line numbers you have to use the form:

CALL LABELNAME

The subroutines in both Basic and assembler usually finish with a return. RETURN in Basic and RET in assembler language.

\*\*\*\*\*

```
90 ' TAPE RSXs by AJ
100 ' Quick save and load
110 ' screens
120 '
130 ' Commands are: :SAVESCREEN
140 ' :LOADSCREEN
150 ' :SUPERSPEED
160 '
170 MEMORY &9CFF
180 A=&9D00
190 s=0
200 FOR D=1 TO 24
210 READ B#
220 FOR C=1 TO LEN(B#) STEP 2
230 f=VAL("&"+MID$(B#,C,2))
240 POKE A,f
250 s=s+f
260 A=A+1
270 NEXT C,D
280 READ E
290 IF E<>S THEN PRINT "Sorry,
Error in DATA":END
300 CALL &9D00
310 PRINT "RSXs have been
installed."
320 NEW
330 DATA 010E9D210A9DCDD1
340 DATA BCC900000000199D
350 DATA C3389DC3779DC3B6
360 DATA 9D53415645534352
370 DATA 4545CE4C4F414453
380 DATA 43524545CE535550
390 DATA 455253504545C400
400 DATA DD21BF9DCD11BCDD
410 DATA 7700CD3BBCDD7001
420 DATA DD71020610C5783D
430 DATA CD35BCDD7003DD71
440 DATA 04DD23DD23C110ED
450 DATA 21BF9D1123003E2A
460 DATA CD9EBC2100C01100
470 DATA 403E2BCD9EBCC921
480 DATA BF9D1123003E2ACD
490 DATA A1BCDD21BF9DDDD7E
500 DATA 00CD0EBCDD4601DD
510 DATA 4E02CD38BC0610C5
520 DATA 783DDD4603DD4E04
530 DATA CD32BCDD23DD23C1
540 DATA 10ED2100C0110040
550 DATA 3E2BCDA1BCC9218C
560 DATA 003E32CD68BCC900
570 DATA 20648
```

\*\*\*\*\*

# Dealing with MIDI

When one American and three Japanese companies agreed on the MIDI standard, they broke new ground in the compatibility crisis that had been plaguing the computer market since the analytical engine.

ooo0ooo

MIDI, or Musical Instrument Digital Interface, to give it its full title, is a set of defined rules which allow suitably equipped instruments, drum machines, modules, sequencers and computers to communicate with each other. To the musician it means that he can play more than one instrument at a time, control his entire performance from one module and multi-track and layer his performance in a way hitherto only possible in a professional recording studio.

While some of the less popular computers are well-catered for on the MIDI market, the Amstrad CPC range is restricted to four packages, each of

	MUST	USEFUL	UNNECESSARY
Keyboard/ Synth	IN/OUT	THRU	-
Drum Machine	IN/OUT	THRU	-
Mother Keyboard	OUT	THRU	IN
Module	IN/THRU	-	OUT
Synth Guitar	OUT	IN/THRU	-

fig 1.

which have been driven to their limits in home, studio and live performance situations.

If you want to try MIDI on the CPC your choices are; Mini Interface with software from Cheetah, Ram Music Machine, EMR Miditrack Performer and lastly DHCP Electronics eight Track Sequencer.

These four cover the entire musical spectrum, from Chopsticks to Chopin and from sitting room to studio to stage in a more than comprehensive way. Each requires the use of a keyboard or other MIDI instrument but with Christmas coming and Santa Dixon discounting keyboards, it shouldn't be too much of a strain on the wallet.

On MIDI instruments there can be between one and three MIDI connections. These are MIDI IN, MIDI out and MIDI through. MIDI in and out are self explanatory but MIDI through bears a little explanation.

If I connect two MIDI devices then the IN/OUT ports are fine but what if I want to string a 6128, two keyboards, a drum machine and a sound module together? I then use MIDI through which passes the original signal on down the line to the next MIDI instrument.

If you wish to purchase a MIDI keyboard, or for that matter, any MIDI equipment, make sure that first of all it is MIDI compatible and that it has the necessary MIDI sockets. I have included (fig. 1) a preferred connection list.

If you are in any doubt as to the suitability of any piece of equipment for connection to a

MIDI system the following checklist may help.

## IS IT MIDI?

This may sound silly but a few of the big manufacturers make seemingly half of their range MIDI and the other half not. MIDI connections are standard five pin DIN sockets and are always marked MIDI IN/OUT/THRU etc. Whatever the salesman says, if there aren't sockets marked MIDI, don't buy it.

## WILL IT DO WHAT I WANT?

If you intend to expand your system later you need MIDI Thru. If you have wide fingers a small keyboard will be fatal.

## WILL IT SOUND LIKE I WANT IT TO?

Dexterity apart, it should make the noises you want. If it doesn't, try something else.

## CAN I AFFORD IT?

Only you know that but MIDI has been around for long enough for there to be a fair bit of secondhand MIDI kit on the market. My own personal preference is the Roland JX3P as they're not expensive secondhand and they do most MIDI things but that is only my opinion. Try them all.

## ACID TEST

Having got a CPC and a desire to do things MIDI, I set out, with the help of David "Monster" Wright, a semi-pro musician and a pound of best Brazilian to digitally boogie the night away.

**THE REVIEWS**

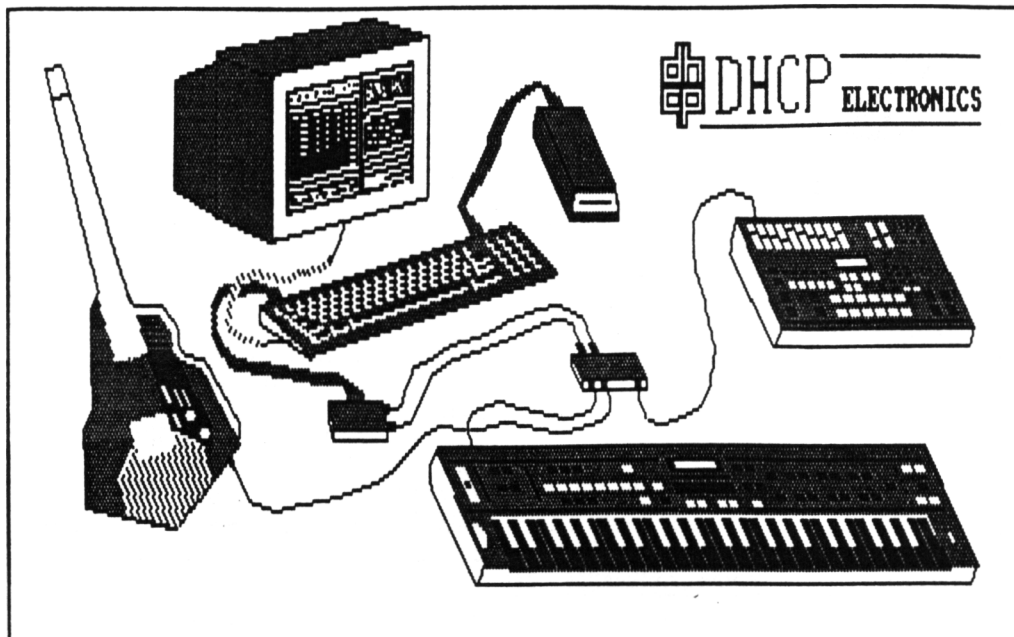
The keyboard that I am using to drive the MIDI kit for these reviews is the Cheetah Mk5 which is the keyboard recommended keyboard for the mini interface. It is a MIDI mother keyboard which means that it doesn't have any circuitry to make sounds but is purely for driving other MIDI equipment and makes a good basis for a system (£50 from Boots when they were trying to get rid of the last few but worth the £100)

**THE CHEETAH MINI I/F**

I started with the Cheetah Mini i/f which, although it isn't really MIDI in the true sense of the word, requires a MIDI keyboard or sequencer to drive it and is a reasonable intro into the world of Binary Bach. I used the Cheetah MK5 keyboard to drive it.

**WHAT YOU GET**

A box of duty free cigarettes. Well not quite but that's the size of the box it comes in. Inside, an interface to connect to the expansion socket (floppy disc if you've a 464) a cassette with the (easy to transfer to



disc) software and a piece of paper with miniscule printed instructions. I had no problems loading/transferring to disc and while a little sketchy in parts the instructions are easy enough to follow.

This interface uses the internal sound chip of the CPC to produce its output and has no conventional MIDI ports. I connected my 6128 to the stereo and got reasonable sound quality. The screen display is a

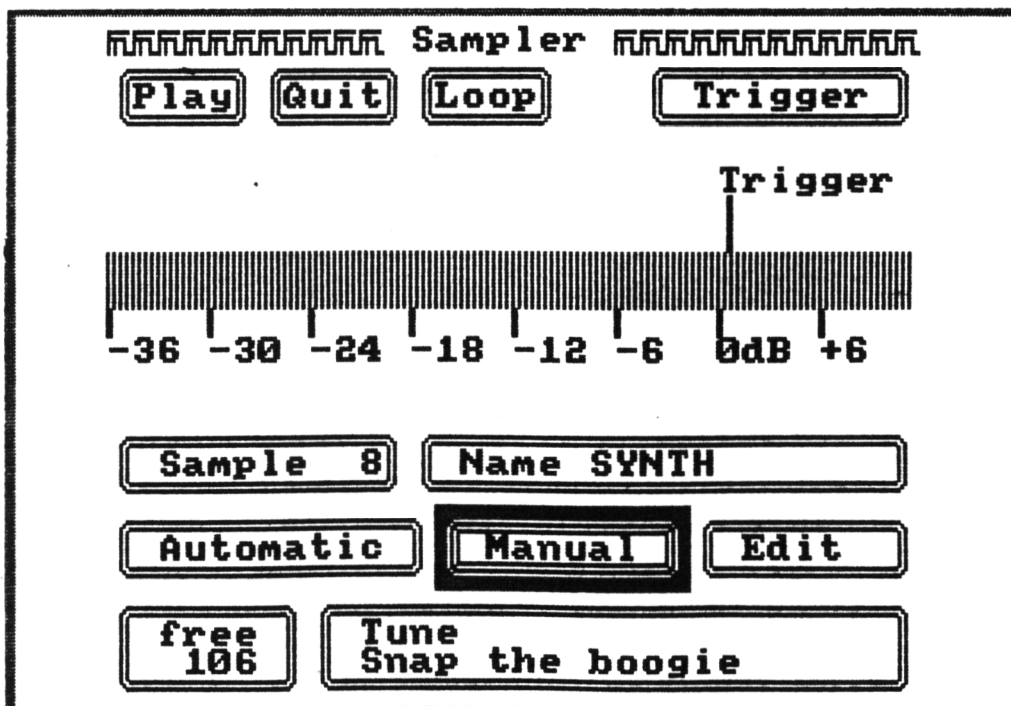
choice of menus which overlay each other as they are called.

Basic synthesiser attributes can be altered and there are graphic representations of these sound-editing features. Noise, modulation, split keyboard, ADSR enveloping and programmable pitch are all supported but even with all of that, it is still down to the internal "three of anything as long as it is a square wave and some hiss" internal soundchip. Very much a system for someone who wants to dabble and learn a little about the way synths work but not a realistic idea for MIDI music even though it does need MIDI input to drive it.

**PRICE**

The most attractive part about the Cheetah Mini package is that, like the Andrum, everyone that still has them seems to be heavily discounting them. There seems to be no fixed price. Cast around for the best price.

If anyone can come up with a piece of software that turns the input in the Mini interface into stand alone voice/tune code, it could give the Mini a new lease of



## DHCP ELECTRONICS MULTI-TRACK MIDI SEQUENCER

TRACK	MODE	CHAN	XPOSE	START	LOOP	TO	FREE
1	PLAY	02	00	01			05%
2	PLAY	03	00	01			77%
3	OFF						100%
4	OFF						100%
5	OFF						100%
6	OFF						100%
7	OFF						100%
8	OFF						100%

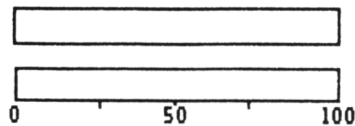
## METRONOME CLOCK TEMPO SIGNATURE BARCOUNT

INT OFF 111 bpm 4/4

f0-CATALOGUE f4-DEC.fine  
 f1-LOAD files f5-INC.fine  
 f2-SAVE files f7-DEC.fast  
 f3-CLEAR data f8-INC.fast  
 f6-START record/play sequence  
 f9-NOTEPAD

### THE NOTEPAD

track 1 equinox main  
 Juno 1 strings.  
 track 2 fills mt32/fb01  
 equinox



whistles (or icons for that matter.) Run "SEQR" and the nattiest loading screen comes up with a prompt to push the spacebar to continue.

After further digging I found that any key would continue and that the other files could be run more quickly without the loading screen. Not that I'd do that, the loading screen is well worth the few seconds.

Whether by chance or design this leaves the "Pro" musician with an opportunity to advertise. Whenever Dave Wright has set up his keyboards with the 6128 the monitor attracts people like bees around honey. So a substituted advertising loader could sit on the

life as a generator of games/program music. After all what better way to generate music than from a musical instrument.

### THE RAM MUSIC MACHINE

In the box is a 36 page manual, the interface, the software, a ribbon cable, headphones and a microphone. When I received it I didn't know whether I had a drum machine, sound editor, personal stereo, digital sampler or pre-amp. Here was a small box the size of a cigarette packet claiming to do things that some studios can't do. Two weeks after its arrival I can confidently say that it does all of those. It seems to be a MIDI interface with duo track sequencer as well.

The software takes you through various menus which are accessed via single keypress. The sequencing part of the Music Machine can be used to drive the internal soundchip or the comprehensive on board Drum Machine but not both together.

If you have a MIDI instrument attached then the drums and sequencer can be used together. The drum sounds are digitally sampled and as such are real drum sounds. I was a little doubtful as to whether the Music Machine would be of any use in a live

music environment but when testing it in the studio I found that it makes a good live drum machine and the drums can be played off a standard MIDI keyboard, a useful feature.

In a world of clinical electronic sounds it is good to be able to inject "live" feeling. This seems to be a set-up for the hobbyist, a sentiment echoed by Martin Shoebridge at RAM, who sees it as a home and domestic studio package offering a good many of the features found in a professional studio at a fraction of the price. To summarise, the MIDI sequencer, Drums and editor make the RAM Music Machine a must for anyone wanting to go MIDI on a restricted budget.

### PRICE

Hold your breath. £50 for the cassette version and an extra tenner for disc. Or, in other words, less than four disc games. Not much to pay for a comprehensive package and for another surprise read the DHCP review.

### DHCP ELECTRONICS ETS

The box with the MIDI ports sits behind your machine connected to the expansion port. Software is loaded from disc or tape and away we go.

This was the easiest MIDI software/interface set to drive. No bells or

screen waiting for the main program load. Well done DHCP for the most unusual feature in a MIDI program.

After the main screen loads, the display is simple to read, self explanatory and clear to look at. As a lover of icons I was a little disappointed at the lack of an AppleMac iconulator but after using the Sequencer I am converted.

An eight track recording studio at a fraction of the cost is a reasonable description. Eight separate tracks each working in real time WYPIWYH (What You Play Is What You Hear) with the ability to quantify notes, the ability to correct notes if you play out of time.

Each track can be looped to save repetition and as you record an indicator decrements from 100% to zero. A metronome which sounds like that infuriating hand clap on the Hooked On Classics is there to help you stay in time. The software will save program/patch changes and there is a notepad which is useful for remembering which track is bass, piano, drums etc.

All MIDI channels are accessible from individual tracks and velocity (how hard you thump the keys) is stored, if your keyboard can send the data for it. I haven't found any bugs.

In fact the first time that I had to refer to the instructions was when charged with the task of reviewing it and then only to check if there were any more features lurking around. There weren't.

It is a well designed piece of work that is simple enough to do as complex a piece of work as this and yet be user friendly enough to throw away the instructions.

#### PRICE

Now the difficult question. How much? The interface is £70 less fivepence and the sequencer is £35 less another fivepence. £105 for the lot and well worth every penny. In fact they can have those two fivepences as well.

#### A BONUS

If you are a RAM music machine owner and you are wishing that you'd waited for this eight track polyphonic package, there is some good news for you. DHCP sell the sequencer configured for the RAM music machine as well.

If you specify the Music Machine, when you order, you get exactly the same package only running on a different interface. Martin Shoebridge at RAM was delighted when I spoke to him and could only praise DHCP for their innovative use of the Music Machine.

Those of us who can add up may have seen a cheap way of having the best of both worlds. DHCP also do a range of MIDI toolkits for the Casio CZ 101/1000, the Korg DW6000 and the FB01. These make it possible to configure your keyboard direct from your CPC with full screen editing and these can be configured to run with DHCP, EMR and RAM interfaces to suit your choice.

Out on stage the DHCP MIDI did the business with an entire set fitting on a three inch disc. A little difficult to read under low stage lighting but this was our own fault for not realising that

it is possible to change the screen colours. It drove A Casio 3000, Roland expander, Yamaha DX7, a Casio CZ1000 and a drum machine admirably and when we deliberately crashed it, it re-loaded in seconds.

#### EMR MIDITRACK PERFORMER

Electro Music Research produce the Miditrack Performer and interface for many different computers. The Amstrad CPC version is one of the best.

#### WHAT YOU GET

Once again, you get a black box with MIDI in/out ports. There is also a plastic book-shaped folder with the software enclosed on both cassette and disc. The software is also available on EPROM but I was unable to get hold of one to review.

Miditrack loads in a few seconds and then presents you with a single screen from which to work. A quick delve into the comprehensive instruction book explained the icons and after taking the choice to use joystick rather than cursor, I soon learned the meaning of the icons.

The Miditrack is another eight track sequencer, only this time no expense has been spared to squeeze nearly every conceivable bell or whistle into it. After having sorted out what does

what I was ready to start.

The classical demo, that is provided, is a fair indication of what Miditrack can do and it is quite a lot. It operates like a multitrack studio tape recorder, only sending control data instead of actual music. This means that like with the DHCP sequencer, you can record in real time, quantify notes, loop tracks and do all the things that you could pay £200 an hour for in a professional recording studio.

When you record, the control data such as aftertouch and velocity can take a lot of valuable recording space. So, if you are recording an organ sound, which isn't touch sensitive, you can switch off the performance controls and save memory.

Another feature is the track arranger which allows you to arrange the tracks in a pre determined order. This means that memory can be saved by the simple expedient of using tracks repetitively.

Out on the road Miditrack fared well. Despite only having a couple of hours in which to learn it, Dave Wright was able to play three sets of forty minutes using Miditrack as an extra eight pairs of hands and get a series of return bookings from a licensee who was at first wary and

**\* \* E M R    MIDITRACK    PERFORMER \* \***

1	0	1	0	F	0
2	0	1	0	F	0
3	0	1	0	F	0
4	0	1	0	F	0
5	0	1	0	F	0
6	0	1	0	F	0
7	0	1	0	F	0
8	0	1	0	F	0

32348

1

1

Welcome to EMR's MIDITRACK PERFORMER  
- this is the most advanced realtime  
MIDI recording system for AMSTRAD!

# WACCI ADVERTISING RATES

TRADE	1/8 Page	1/4 Page	1/2 Page	Full Page	Double Page
1 INS	5.00	10.00	20.00	40.00	80.00
3 INS	13.50	27.00	54.00	108.00	216.00
6 INS	24.00	48.00	96.00	192.00	384.00
12 INS	42.00	84.00	168.00	336.00	672.00
PRIVATE	1/8 Page	1/4 Page	1/2 Page	Full Page	Double Page
1 INS	2.50	5.00	20.00	40.00	-----
MEMBERS	1/8 Page	1/4 Page	1/2 Page	Full Page	Double Page
1 INS	1.50	3.00	20.00	40.00	-----

LINEAGE ADVERTISEMENTS FREE TO MEMBERS - up to 50 words max.  
(subject to available space - no lists, no swaps, no copying)

**COPY DATE**

**WACCI** 59 The Green  
Twickenham, TW2 5TU

**NOV  
16**

MEMBERS and PRIVATE advertisers, cheque/po with order please.  
TRADE advertisers invoiced if desired. Phone (01) 898 1090

Music Machine is now suitable for the studio and professional musician.  
**RATING \*\*\***

THE DHCP ETS: is a simple to use set-up that will enhance the craft of any musician, serious or otherwise and when it can be combined with the Music Machine for a total of £85 or with its own interface for only £105, it is a sound investment for the home, the studio and the Hammersmith Odeon. For references on DHCP apply to Jean-Michel Jarre, as it was David Wickford at DHCP who did the software for the Laserharp at the Dockland's concert.  
**RATING \*\*\*\*\***

then incredulous at the idea of a computerised band.

### THE PRICE

All in all the Miditrack is a deluxe package with a host of features and weighing in at £130 it is certainly the heavyweight in the price stakes.

For that £130 you get a well thought out package, equally suited to home, studio and stage. Although this is a real time sequencer, EMR promise a step time editing package in the near future, more suited to the vagaries of the studio where every second counts.

### --- THE VERDICT ---

THE CHEETAH MINI: is a nice addition for the CPC owner who wants to learn a little about music and the abilities of the CPC soundchip but remains a purely "home" package.  
**RATING \*\***

THE RAM MUSIC MACHINE: at £50 must rate as the best value peripheral on the market, an essential for the hobbyist and the home studio, with sequencing, drums and sampling all included. With the advent of a Music Machine compatible DHCP sequencer, the

THE EMR MIDITRACK PERFORMER: is a truly professional MIDI interface and software from a company devoted to Computing and Music.

The Miditrack was reviewed two years ago in "Your Computer" and at that time was the only MIDI for the CPC and described as "50% cheaper than the packages for other computers." Not alone in the CPC marketplace now, it is still as at home in studio or stage and is good value for money at £130 for the interface and software.  
**RATING \*\*\*\***

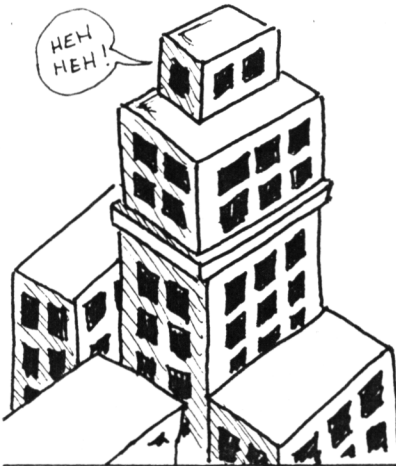


# SUPERPHIL

EPISODE TWO

SCRIPT AJ  
ART ANDY

LAST MONTH:  
KEY MEMBERS OF  
WACCI HAVE GONE  
MISSING..



AT LAST! NOW  
MY MAGAZINE  
WILL BE THE  
MAGAZINE FOR  
AMSTRAD  
READERS.

WITH WACCI'S STAFF  
WORKING FOR ME, ACU  
WILL BE THE MOST  
POPULAR MAGAZINE  
EVER! HAR HAR!

SIMON ROCKMAN

MEANWHILE...

IS THAT SUPERPHIL?  
WE HAVE A PROBLEM..

OK, I'LL SEE WHAT  
I CAN DO.....  
ALEX... ALEX..

BUT..

TELEPHONE

HELLO...  
ALEX... ALEX..

IT'S UP TO  
ME TO  
SAVE THE  
DAY!

SO SUPERPHIL SPRINGS INTO ACTION...

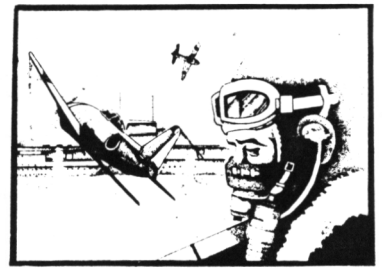
WOOSH

TO BE  
CONTINUED

# in the doghouse

SIMSPOT

Simulations old and new, KEN WALKER reviews them for you. (Wordsworth)



SIMSPOT  
55 GREENBANK ROAD  
DARLINGTON, DL3 6EN

## THIS MONTH A COMPARISON OF HELICOPTOR SIMULATIONS

Last month *Microprose* finally got around to releasing their highly acclaimed chopper simulation *GUNSHIP* for the Amstrad, almost a year since it appeared on the Spectrum.

As we have come to expect from the Number One simulations experts, the game comes supplied with a detailed manual and supplements to cover almost every aspect of flying an AH-64A Apache gunship. Yet despite the proliferation of technical data, the controls are relatively easy compared to some earlier games and within a few minutes I was up and flying to meet the enemy for another epic encounter.

((((00))))

Flying a chopper requires a very different technique to other machines - no flaps, brakes or landing gear to worry about but there is a new language to learn which includes cyclic, collective and torque. Consequently, achieving level flight is a bit harder than for example an F15 fighter but take off and landing are much easier. Overall most friends prefer chopper sims and I must admit the few examples available have the edge over the aircraft.

### INTO BATTLE

When tackling a simulation for the first time, it is always best to try the training mode where the enemy act stupid and don't fire back - a good way to impress friends and improve

your macho image by blasting the enemy without fear of retaliation. *Gunship* provides such an opportunity for personal satisfaction and allows a useful exercise to familiarise yourself with all the controls.

Take-off procedure is common for all choppers - turn on the engines, wait for a corresponding increase in engine revs, engage rotors, increase collective (you should now be off the ground) and joystick forward for pitch down to increase forward speed. It takes a while to achieve control of height and speed - a combination of joystick and keyboard controls to find the desired balance of collective and pitch values.

Once flying the next problem is to locate the enemy and to help there is a separate map (M key) with CRT display and radar detailed on a superb cockpit display. In addition there are two navigational aids:

(1) *Inertial Navigation System* (INS) which sets a destination from the map and provides direction indicator on the cockpit compass.

(2) *Target Acquisition and Designation System* (TADS) for locking onto a target for range and direction.

After completing the training phase there are combat missions from SE Asia, Central America, Middle East and Europe in an ascending order of difficulty. For these you will be thankful for a variety of counter measures available to defend the chopper which include chaff, flares

and radar jammer, familiar items for those who have played F-15 Strike Eagle. Needless to say *GUNSHIP* carries its own potent strike potential in the form of 30mm cannon, rockets, Hellfire and Sidewinder missiles.

The use of all these weapons and counter measures are comprehensively explained in the manual, as are the various missions which are accompanied by maps and tips from the Sergeant Major. At the end of the day success relies on pilot skill in chopper control, shooting and taking evasive action against enemy missiles.

Try SE Asia for a none-too-difficult introduction to combat. There are no enemy aircraft to worry about but the guerilla force artillery firing the occasional SAM missile should manage to hold your attention over Vietnam and Cambodia.

### APACHE FLASHBACK *GUNSHIP*

This is not the first game to feature the AH-64A Apache since Digital Integration were there first with *TOMAHAWK* in 1986. It became one of the biggest hits of the year, despite the Lenslock loading system and time has failed to age one of the best and most playable of all simulations.

The game has four missions, one being in training mode where the enemy do not return fire. Unlike *Gunship* there are no geographically defined scenarios and the enemy could be anywhere but they do vary in difficulty from a short mission to



destroy ground forces to a strategic battle for occupation of the entire map. Flying conditions can be set from the initial menu as to whether it is day or night, cloudy or clear (you can even select the height of the cloud-base) and finally you may include crosswinds and turbulence for the extra spice to the mission.

Take off and control is similar to *Gunship* but it should be as it is the same chopper. Navigation is more basic, indicating only track and bearing to intercept targets. Would be pilots may find this more helpful as the INS system on the modern version can at times be confusing in the heat of battle. Another advantage for *Tomahawk* is in identifying the enemy which appear as clear red symbols on the TADS display.

No such display is evident for *Gunship* and you rely on precise identification of targets from the radar, map and cockpit views but the radar does indicate the enemy as red dots with allies in blue.

Both games feature smooth, excellent graphics and the scenarios are sufficiently varied to

provide a lasting challenge. Can they be improved? Well that is basically a matter of opinion but on the *Commodore* there is another chopper game (no I do not mean *Karate*) that takes simulations a stage further.

#### BLAST THEM WITH HUEY

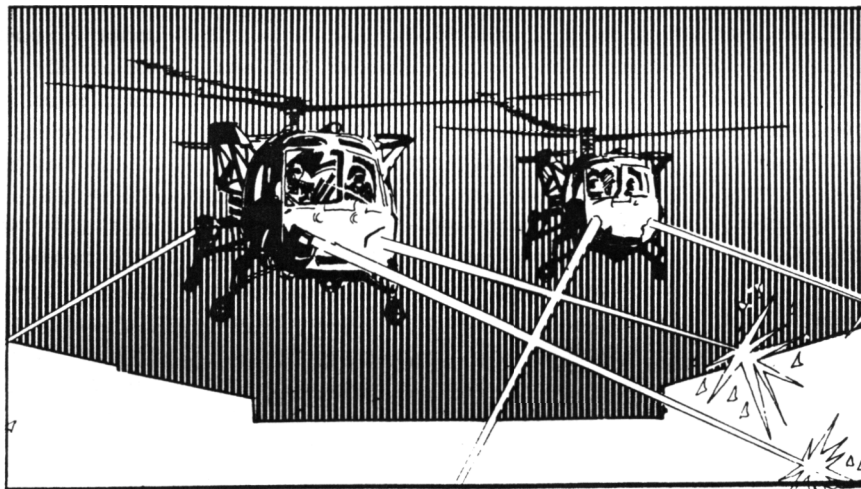
The biggest drawback to simulations can be their complexity - some attempt to be so accurate as to be almost unplayable. *Fighter Pilot* and *Jump Jet* are early examples of aircraft which proved difficult to handle in combat and landing and so put off many players at an early stage. Many a game has been dumped when frustration became too great.

*SUPER HUEY* is a simulation of similar complexity but includes a

unique feature to overcome those early problems. The training flight is unique because it guides the novice through basic manoeuvres, take off and landing with a series of on screen prompts. By following the prompts you will be flying at the first attempt and consequently confidence is gained instead of frustration.

I mention *Super Huey* because a feature on helicopters would not be complete without reference to the most accurate simulation of them all. For a start the collective, pitch, revs and direction are all controlled via the joystick (no compromise to the include keyboard for easier operation.)

The fire button engages control of throttle and collective whilst without the button the joystick controls



cyclic and rudder for direction and forward thrust. More complicated, it is true but not impossible after a few minutes in the training flight.

#### OUT OF REACH

Now before you sim fans rush out to buy a copy, I hasten to add that it is only available on the *Commodore* - Oh, all right I am sorry but I still mean to continue and you could be forgiven for thinking that it should have no place in *WACCI*. My excuse is to call for better simulations.

By a strange twist of fate, *Super Huey* was produced by *Cosmi* in 1985, who are now a subsidiary of *Microprose*. Many of the excellent features of this game have failed to be carried over to their games of

today. For instance, the cockpit display is almost a replica of the actual Bell UH-1 series helicopter it represents and the cockpit structure allows views of the ground above and below the control panel. It really does feel like flying inside a glass bubble over the countryside.

#### THE MISSION

The combat mission is similar to that available for *Tomahawk* but in addition to this and the training flight there is a survey mission over uncharted territory and a task to winch military personnel off a mountain. The follow-up game one year later (called *Super Huey II*) has yet another six scenarios which require putting out a bush fire, rescue from a blazing oil well, Arctic

rescue and a war at sea. They even include the Bermuda Triangle and knocking off a bunch of terrorists. The original control panel has been updated by designers for a more futuristic role to cover the chosen scenarios, in other words, such a helicopter has yet to be built. Still the machine handles more simply than its

predecessor but the scenarios are realistic enough to test pilot ability to the limit. Perhaps we won't have too long to wait for a similar experience on the *Amstrad*.

#### FINAL BRIEFING

*Gunship* costs £14.99. *Tomahawk* a mere £9.99 or £2.99 from some outlets.

Bigger does not necessarily mean better and for sheer enjoyment, challenge and realism I found it hard to separate the two. *Super Huey* proves that flying is fun and you do not have to be blasting away all the time to get your thrills.

You cannot beat the exhilaration of flying and these helicopter simulations are the closest you'll get to it on the home computer.



# bankman



ALASTAIR SCOTT SHOWS YOU HOW TO GET THE MOST FROM YOUR 6128'S SECOND 64K OF MEMORY

Here we go. You can either pant loudly (don't get too excited!), write to Mary Whitehouse, or feel hurt, alienated and resentful: lie down on the couch, and I'll ask you a few questions.

Well, I think I understand a little about it, so the rest of you come in, gather round (don't all sit on the couch - it's got woodworm!) and I'll tell you everything I know.

Of course, if you're not using Bank Manager within a program, just type the normal Run"Bankman" with side 1 of the CP/M master disc in the drive.

As you have probably guessed, Bankman.bin is the vital part of Bank Manager. Bankman.bas, like the program above, loads and initialises Bankman.bin, but is unnecessarily complicated - it does peculiar things like checking whether you are trying to use Bank Manager on a 464 or a 664. You wouldn't do a silly thing like that, would you? If you want to have a good laugh, look at the original loader. It's protected Basic, so you'll have to load and deprotect it before typing LIST (using, for example, my program DEPRO, also known as AMS-061, from the FSW Library).

Bankman.bin is a great chunk of machine code, 1317 bytes long. It should really have been stored in ROM (all complaints to Amstrad PLC) so that it was available immediately on switching on the machine, but we'll just have to make do. The best thing about this machine code is that it is completely relocatable. This means that

o0o0o0o

Bank Manager consists of two programs: Bankman.bas and Bankman.bin. Every time you need to use Bank Manager in your own Basic programs, the User Guide tells you to run Bankman.bas before loading your own effort. This is annoying, especially if you can't be bothered swapping discs, so here's what to do.

Firstly, copy Bankman.bin to your working disc. This is easily done by putting the CP/M master disc (side 1) into drive A, then typing:

```
:CPM
PIP B:=A:Bankman.bin
```

and changing to your working disc when prompted for drive B. After this, tack the following loader onto the start of your program:

```
100 ON ERROR GOTO 140
110 :BANKOPEN,0
120 ON ERROR GOTO 0
130 GOTO 180
140 MEMORY HIMEM-1318
150 loc=HIMEM+1
160 LOAD"Bankman.bin",loc
170 CALL loc
180 '
190 'the rest of your program
200 '
```

```
start=something
MEMORY start-1
LOAD"Bankman.bin",start
CALL start
MEMORY start-1
LOAD"Bankman.bin",start
CALL start
```

will load and initialise the code at start address start, as long as something is any address above or including &8000. With most machine

1. Do you have a 6128, and do you find the extra 64K Mr. Sugar kindly gave you about as much use as an unformatted chocolate digestive?  
Yes - go to section 2.  
No - turn the page.
2. Are you a student?  
Yes - go to section 3.  
No - go to section 4.
3. The Bank Manager is that compassionate person who gives you £100,000 every term to help finance your purchase of the Old Peculier Distillery. Now go to section 5.
4. The Bank Manager is a horrible ogre with a twisted face who sends you scary letters and who managed to steal the extra money cuddly Mr. Lawson put into your ninety-day account. Now go to section 5.
5. The Bank Manager is a little program stored on the same side of the CP/M master disc as the DISCKIT3 program you use to format digestives. Nobody understands it, not even the man who wrote the 6128 User Guide.

code programs, you can only load and initialise them at one address - try another, and the computer will crash! (Okay, take the letters of protest back). In my loader, the code has been loaded at the highest address it can go, just below HIMEM, so you have as much free memory as possible.

What's the point of all this? Once you've loaded and initialised the code, you'll have, to your amazement and mine, six new commands added to Basic. They're preceded by the notorious ! (SHIFT-@) symbol, just like the disc commands !DUNCAN, !EVANS, !ERA and so on. They are:

```
!SCREENSWAP
!SCREENCOPY
```

```
!BANKOPEN
!BANKREAD
!BANKWRITE
!BANKFIND
```

As you'll soon see, they fall naturally into two groups. The first two relate to storing screens in the extra 64K memory, and are not much good. The others allow the memory to be used for storing strings, and are very useful. I'll take the two groups separately.

With Bank Manager, you now have five screens available for text and graphics, and can switch between them at any time. Let's call them, fairly logically, screens 1,2,3,4 and 5. The golden rule is that screen 1 is always visible, but screens 2 to 5 can never be seen, unless you copy them to screen 1. How do you do this? Easily.

!SCREENCOPY,s1,s2 copies screen s2 to screen s1. "Imagine putting s1 and s2 the wrong way round!" you might say. Yes, I know it's ridiculous, but that's why the guy's in a straitjacket! Try this short program:

```
10 MODE 1:CALL &BC02:INK 2,14
```

To start off, you're dealing with Screen 1. CALL &BC02 sets all colours to their default values.

```
20 GOSUB 100:PRINT"This is Screen 2"
```

Puts coloured blocks everywhere, then prints a rather inappropriate message on Screen 1. Silly? No, as the next line makes sense:

```
30 !SCREENCOPY,2,1
```

Now screen 1 has been copied to screen 2, and logic prevails, unusually for WACC1.

```
40 MODE 1
```

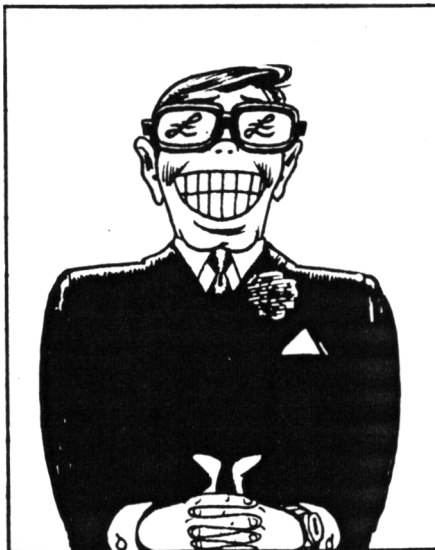
This clears screen 1.

```
50 GOSUB 100:PRINT"This is Screen 1"
```

This prints something sensible on screen 1.

```
60 WHILE INKEY$=""
70 !SCREENSWAP,1,2
80 FOR delay=1 TO 500:NEXT
90 WEND:END
```

This sets up a loop, which continues until you press a key. The !SCREENSWAP,s1,s2 or !SCREENSWAP,s2,s1 command swaps screens s1 and s2 around, so screen 1 is moved to invisible screen 2, and screen 2 is moved to visible screen 1. Repeat the command, and you're back to where you started. So you can swap between two screens ad nauseam, and create some very crude animation. (Pass the sickbag!)



```
100 FOR block=1 TO 200
110 bx=INT(RND*40)+1
120 by=INT(RND*25)+1
130 bpen=INT(RND*3)+1
140 bppr=INT(RND*3)+1
150 PEN bpen:PAPER bppr
160 LOCATE bx,by
170 PRINT CHR$(207);
180 NEXT
190 PEN 1:PAPER 0
200 LOCATE 11,10
210 RETURN
```

This prints little chess boards (ASCII code 207) all over the screen in various shades to give you the false impression that there are more than four colours in MODE 1 and so you must be sitting in front of a Spectrum. (Yes, I had one many moons ago as well. We all have our weaknesses!)

Returning to Bank Manager, you could, if you wanted, try something like !SCREENSWAP,4,2. This would swap screens 2 and 4, but you wouldn't see the swap taking place - remember that screen 1 is the only one that is ever visible. The same thing happens with copying screens: !SCREENCOPY,3,5 would copy screen 5 to screen 3, but nothing would appear to happen. As you can imagine, it is very easy to become confused as there is no indication of a successful swap or copy.

On running the program, you can immediately see the drawback with these commands. They are messy! The problem lies with the Amstrad's screen memory, which occupies 16K (compare the Spectrum - 8K, the British Broadcasting Corporation Micro - 1K to 20K, and the Commodore 64 - 4K to 8K).

More screen memory means better resolution, more colours, and a good opportunity to laugh at the other computers mentioned, but it also takes longer to move 16K from memory to screen than it does with 8K. This is only too obvious: you can see an effect like venetian blinds opening and closing as screens are swapped. *There's very little you can do about this... unless you read next month's BANKMAN article and see how I managed to get round it rather nattily.*

---

# A Passing Thought

---

THE LAST OF THE PRESENT SERIES OF PASSING THOUGHTS FROM JOHN RIDGE

---

In a past issue of WACCI a while ago, someone wrote to the (then) editor and asked what the symbol "^" meant. It was a sensible question, for unless you happen to know what it means, or have seen enough listings to guess from the context, it seems to bear little resemblance to any conventional symbol used in mathematics or its Locomotive *Basic* equivalent.

--000--

The answer given was succinct and to the point, but there was a tacit but doubtless justified assumption that the reader would know something about exponentials, so it was not deemed necessary to go into a long-winded explanation.

In the same issue there was an article about speeding up *Basic* programs, and very good it was too, complete with examples and timings. Most of the article consisted of rules-of-thumb which anyone with a slight knowledge of *Basic* could follow. One piece of advice was rather different. It suggested that we avoid the use of functions such as  $\text{COS}(x)$  and go for Taylor or Maclaurin series instead.

To be fair to the author, he acknowledged that more than a familiarity with *Basic* was involved. I dare say the suggestion was good for those who are well-versed in the exotic art of dealing with rapidly converging series, but I rather imagine a great many readers are not.

We, the untutored, would require further help in order to benefit from that particular suggestion.

Now, please don't get me wrong. No adverse criticism is intended whatsoever, whether of the questioner, the author or our esteemed editor. It is just that between them they have underlined what I think is an interesting point.

--000--

As far as programming is concerned WACCI serves the useful purpose of answering questions. In many ways, I suggest, the distinction between an article and the sort of answer which is given to a direct question from a reader is not all that great. It is just that whereas an article answers a series of unasked questions in a logical order, the answers to direct questions must perforce tend to be random and isolated.



One of the uncertainties any writer of an article has to face is that of not being sure whether he is answering questions which hardly anyone would ever dream of asking.

As reader-response is usually rather underwhelming, he can seldom be sure. Still, we all have our burden of troubles to bear, so we will shed no

crocodile tears for chaps who write articles. Instead, let us address ourselves to the question of ...er... questions about programming, be they actual or potential.

--000--

Some questions will be language specific. For example, it might be asked what the function *INSTR* does, or what is used in *Amstrad Basic* as a substitute for the *SET* command found in some other dialects. The question cited about the "^" symbol might be placed in this category.

Other questions will be far more general, and the answer could apply to several or even all computing languages. It might concern the pros and cons of using static or dynamic data structures in linked lists, or a suitable algorithm for a particular task. An algorithm, of course, is a series of procedural steps for the solution of a problem, although not all problems will lend themselves to algorithmic methods of solution.

Mostly, though, this sort of question will tend to be about matters that are not confined to computer programming. It could be about maths, Boolean logic, perspective drawing, or countless other subjects.

It is when a question contains elements from both categories that I begin to feel a little uneasy. If someone asks about the difference between  $\text{LOG}(x)$  and  $\text{LOG}_{10}(x)$  the short answer is that the former calculates natural, Napierian, or base *e* logarithms, whereas the latter calculates common, Briggsian, or

decadic logarithms. It says as much in the Instruction Manual, but perhaps rephrasing the explanation might make things clearer. It could be, though, that the person has no idea what a logarithm is, and vainly hoped that the answer to his question would automatically give him some sort of clue. Similarly, it is not very helpful telling me that the size of an angle can be found by  $\text{ARCCOS}(x) = -\text{ATN}(x/\text{SQR}(-x*x+1))+\text{PI}/2$  if I have no knowledge of trigonometry. It does not really advance my knowledge all that much. Although the information is much appreciated, it is altogether too learned - it is not understood.

It could be argued that a prior condition to learning *Basic* and most other computing languages is a knowledge of elementary mathematics, and that is why small children can manage nothing more interesting than *Turtle Graphics*.

That is all very true, but what is meant by "elementary" mathematics? The terms elementary and advanced are relative, not absolute. Where, pray, does the one end and the other begin?

Small children are excluded, not because of lack of knowledge, but because the vast majority of them lack the ability to understand at such an early stage of mental development. The same may not be true of a man of 60 whose education was cut short when he was 14, or a woman who, after years of commitment to domestic duties and family care-taking, finds that she has forgotten her schoolgirl mathematics. There is a difference between not knowing and the lack of intelligence to understand. As I say, I feel a little uneasy if there is an assumption that anyone

wishing to program must of necessity have a prior knowledge of mathematics which extends well beyond the four fundamental operations.

It could lead to the door being slammed in an awful lot of faces. Should we not be helping people rather than rejecting them?

When someone reports that  $8492.36^{\wedge}0$  produces the answer 1, and wonders if this is caused by a bug in *Amstrad Basic*, there is a strong temptation to impatiently tell him to look the matter up in a maths text-book, for God's sake, and stop asking stupid questions. Well, yes... The temptation is less strong if someone who is interested in computer graphics

is puzzled by transformations, even though he may not use the term itself. There is material for an article or two in that question, all about matrices and so forth. What a good question! Answering it will provide lots of fun and demonstrate to the world how clever the author is. Although neither question is language specific, I suggest that the former is more worthy of a serious and comprehensive treatment because it touches upon the use of an important *Basic* function. Of course the answer is not primarily to do with computer programming as such, but then neither is the answer to the second question, and by a far longer chalk.

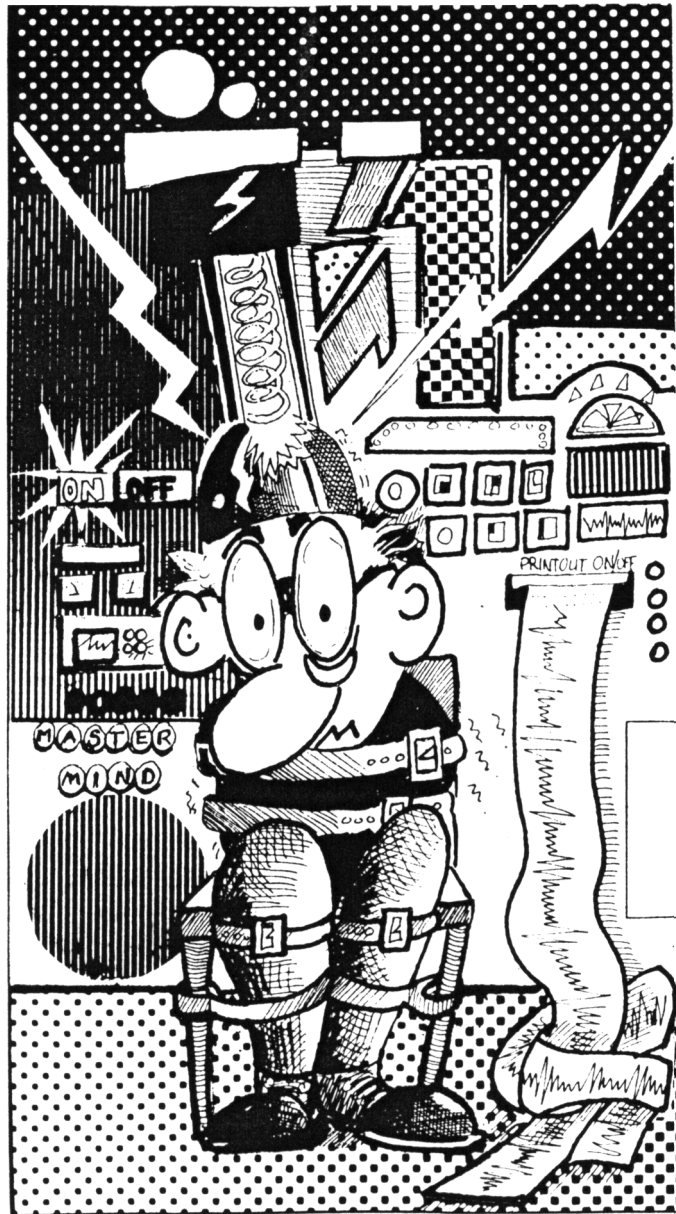
I am not advocating that WACCI should become a sort of serialised maths text-book. Its purpose is not to educate, but to inform, at least in part, and the two things are different.

It is useful to know the theorem of Pythagoras, but not essential to furnish rigorous proof in order to apply it. Info about what Pythagoras has to say is possibly appropriate in a computing magazine, but formal proof belongs to the school bench.

As to just how much information about elementary maths newcomers to computing have a right to expect, or what the more experienced users can be expected to tolerate in a magazine like WACCI, I haven't bothered to figure out. After all, this was just a passing thought.

As a self-appointed champion of those who are new to computers, though,

I do feel that we should do our best to provide them with as much help as possible, and if their need is a little guidance on the more mathematical aspects of languages and programming, so be it.



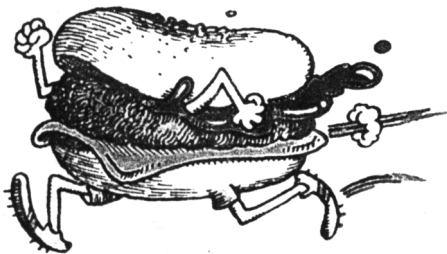


# Glenn at Large

THIS MONTH TOILETS... FILMS... TERROR TRIPS... DOGS AND DRUGS.

I start this month by taking a sideways look at toilets. And why not?

Here in the UK we spend over nine months of our lives on them. In America, however, they only spend seven months in the bathroom. Its something to do with their passion for hamburgers and ours for curries.



When Americans are in the WC though, they do like to make the most of it. A Japanese firm are currently exporting a loo which collects health data like blood pressure, heart rate, sugar level in urine etc and then displays the information on a screen. And you thought you could escape the wrath of the VDU!

Also, to make your stay more comfortable, snops in Scotland sell special tartan toilet seats, engraved in beech wood with clan colours. The outfit comes complete with a toilet roll holder that plays electronic bagpipe music.

Meanwhile, if you feel that your

local toilet is worth the coveted "Loo of the Year" award, send your nominations to: Grove House, 24 Worple Road, Wimbledon, London, SW19 4DD. The current holder is the Hatton Court Hotel near Gloucester, whose loos attract many hundreds every year.

You may think that whilst we here in Britain were having battles instead of baths, the Romans were spending all their time being hygienic. Not so, a recent excavation of a Roman Fort in Dumoria found that fragments of old letters were used for toilet paper.

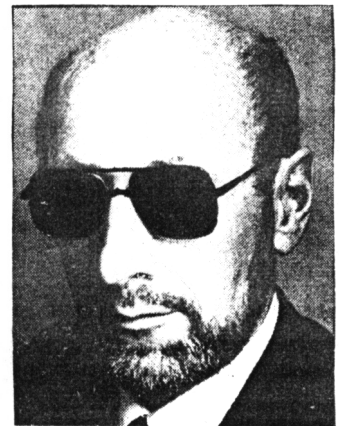
-0--00--0-

Let's face it, some people think that this sort of talk is a little taboo. In Spain, they definitely do.

Film censors there cut out what was considered to be "offensive sound effects" from Mel Brooks hilarious comedy western, Blazing Saddles. Spanish filmgoers were spared the scene where cowboys sit around a camp fire, eating beans and breaking wind.

The film was a hideously funny parody on serious westerns. Victor Mature, who was usually cast into these sort of films, was in fact, frightened of horses. If the plot demanded him to ride he would be filmed sitting on a saddle strapped to a beer barrel whilst moving on a jeep.

Staying with the movies, the dirty mac brigade of 1997 must have been pretty disappointed, after queuing to see "Fatima", a film promising a belly dancer in full flow.



The censors had a different idea about the whole thing and placed two white lines across the screen so all that was visible was her head and legs.

-0--00--0-

Dark haired, Oscar winning Judy Garland may have been seen in "The Wizard of Oz" wearing a blonde wig if one of the directors had his way. Four directors worked on the picture. The Academy Award winning song "Over The Rainbow". (I'm sure anyone reading this knows at least some of the lyrics to it) was nearly axed if it wasn't

for one of the four who battled to save it. The pair of ruby slippers worn by Garland in the film were sold at a staggering £91,700.

-0--00--0-

From the staggering to the chilling now. Remember the old black and white film "Hound of the Baskervilles" that BBC used to show every now and again, with Sherlock Holmes (Basil Rathbone) and Dr. Watson (Nigel Bruce)? Well, a holiday firm in Dartmoor, where the film was set, are planning special eerie "terror trips".

They have one slight problem though. They need a Boris Karloff look-a-like to be a guide to give your trip that special touch. Do you qualify? Are you seven feet tall with a bolt through your neck? If so they would like to meet from you.

After seeing robbery films on Irish T.V. thieves in Dublin tried to copycat one of the break ins, this time, into a supermarket. The crooks cut a hole in the floor of the premises but forgot to include a canopy overhanging the pavement in their calculations. The result of jumping through the hole found themselves landing in the street.

It just goes to show we can't be perfect all the time, although there have been records of children being very close to the mark. The aptly named Thomas Young mastered maths and science at 14, not to



mention a mere matter of nine languages. Sorry, did I say nine languages? Makes you sick doesn't it? Perhaps TV soaps make you sick as well.

Neighbours, already sky high in the ratings, has attracted an even wider audience, of babies who got addicted when their mothers relaxed over their lunchtime fix of the soap. Researchers at Queens University Belfast, found that babies stopped crying and were lulled into sleep as soon as they heard the theme music.

Meanwhile, if you can't get to sleep but hate Neighbours, then try a drink of Typtophan, which helps you to relax and prepares your body for a snooze.



Meanwhile, in New Zealand, dogs are getting lazier as daytime TV schedules get better. A vet there claims older dogs slow down due to too much TV. A vet in Northumbria has told a dog owner to stop letting "Rover" (imaginative name eh?) smoking up to twenty cigarettes a day.

So if you are one of the puffing millions who are trying to give up smoking at the moment, just remember poor old Rover, who's in exactly the same situation.

Let's face it, if a dog can do it then so can you.

-0--00--0-



But instead of rushing to the chemists try the dairy, because, guess where large quantities of the chemical can be found? Where else but in humble milk.

An animal which knows all about milk is the cat. They dream up to three hours a day, mainly of catching mice and birds. Mice and birds only dream for about fifteen minutes, otherwise they might get caught by the cats.

Ginger, who caught mice at Salisbury Cathedral, was loved so much that he's now immortalised in a twenty foot high stained glass window.

And that's it for this month's AT LARGE. I am going to leave you with an air of mystery (well this article did start off talking about personal hygiene). So, suffice to say, next month I shall be taking yet another side on look at life but this time it will be from above. Confused? I will be. Until then... Hello!

GLENN AT LARGE  
THE ATTIC IN THE HAVEN  
COVERACK, NR HELSTON  
CORNWALL, TR12 6SY

# the hard stuff

A SOMEWHAT SUBDUED PHIL CRAVEN CONTINUES HIS ROAM AROUND THE ROMS

If the only problem I had with this month's column was my glaring error in the last issue then I would be a lot happier than I am. The error is easy to deal with:- the control register in the 8255 is, of course, a write only register and not a read only register. But you all realised that, didn't you? The main problem is that I cannot continue from where I left off, as I said I would.

-ooo0ooo-

Last month I described the CPC's I/O map organisation as it is stated in a number of books. The main arrangement is that only one of the top six address lines can be low at any one time and A10 is the low line for any peripherals we may wish to add. Within the allowable addresses afforded by A10 low, some are already used or reserved by the CPC (namely A5 low, A6 low and A7 low) which means that we are left with the addresses I stated. All of it made good sense and was easy to understand, right up until I did some experimenting.

-ooo0ooo-

To prepare this column I built a decoding circuit which would access an 8255 only when the correct I/O address was issued. As always, I used an LED to indicate whether or not my circuit worked - and it did. I could OUT the correct address and turn the LED on and off at will. The problem was that there was something else turning it on and off as well. I decoded IORQ (lo), A10 (lo) and A5 to A7 (hi).

According to what I've learnt, nothing in the machine should be OUTing these signals simultaneously but something was not only switching the LED but doing it very rapidly. I tried adding A15 (hi) to the circuit which stopped the rapid switching but not the occasional kind. I even got the LED switching during listing.

It would be easy enough to produce a full address decoder for an 8255 and continue from last month but the "one line low" arrangement should make it unnecessary to go to those lengths. So for now I'll divert our attention to building our own ROM board and get back to that topic at a later date when I've sussed it out.

-ooo0ooo-

One of the first things the CPC does on power up is to initialise any background ROMs that are present. To be more accurate, it allows each ROM to run its own initialising routine which often includes stating its presence on the screen. At this time each ROM found is placed on the list of potential RSX (bar command) receivers. Up to fifteen background ROMs, including the internal disc ROM, are allowed to be connected to a 6128 and up to seven to a 464 or 664. Each ROM has a number, one to seven or fifteen and it must be physically located at its number by hardware.

That may be a bit difficult to understand at the moment but it will become clear as we go along. The system expects to find all external ROMs in the top 16k of memory (C000 -

FFFF) and, whilst it is possible to locate them elsewhere, it is a lot easier to fit in with the excellent expansion system provided.

-ooo0ooo-

The way that the CPC finds if a ROM is present is by OUTing each ROM number in turn from fifteen down to one, to an I/O address which is solely reserved for external ROMs. After each number has been OUTed the first byte is read and compared with one of three numbers. If any other number is obtained then no ROM is present and the programme moves on to the next ROM number.

The point is that OUTing is a write operation. A ROM, of course, cannot be written to but it is done so that the external hardware can use the signals produced to enable a ROM chip ready for the first byte to be read. This method of enabling a ROM is used not only for initialising but also whenever a ROM is required.

Is everybody with me so far? Good. We'll press on. The signals produced when OUTing a ROM number are:

IORQ	goes low
WR	goes low (see
A13	goes low -(last
A15	goes high (issue
ROMEN	goes low
D0 - D3	have the ROM number

A careful study of the I/O map details will reveal that the logic level of



A15 does not concern us and that A13 being low in an I/O address is the only address line we need to decode. However, the same problem I mentioned earlier also makes its mark here and I have found that Amstrad's stated I/O system doesn't work for external ROMs without decoding A15 or A14 high. In this case the manual does say that A15 needs to be included but I'm at a loss as to know why. I expect that the reason is obvious and I'll be most embarrassed when I discover it.

-0000000-

IORQ and WR are control signals produced by the Z80. IORQ is sent low when an I/O address is on the bus and WR is sent low when the Z80 is doing a write operation. So both signals go low when a ROM is being enabled. A15, A13 and D0 to D3 are also Z80 sourced but ROMEN (ROM ENable - active low) is produced by the CPC's gate array chip whenever a ROM, including the internal one, is being accessed. It, along with all the other signals, is available for our use on the expansion edge connector at the rear of the computer.

To start with we'll design a circuit to accommodate up to seven ROMs numbered one to seven. Later we can see how to add ROMs eight to fifteen.

-0000000-

There are many ways of decoding the above lines to produce chip enable signals for each ROM. I have chosen a method which uses chips that we have previously looked at. IC1 is a dual two to four decoder (74LS139). IC2 is a three to eight decoder (74LS137).

As you can see from the logic diagram, IC1 is enabled every time an I/O address is on the bus. This will always cause one of its four outputs to go low according to the levels of its A0 and A1 inputs. However, the zero output will only be low when both WR and A13 are low together and this will only occur when an external ROM

is being enabled. So this output is used to partially enable IC2.

IC2 has three enabling inputs two of which must be low and the other high, at the same time, for the chip to be enabled. E1 (active low) is fed from IC1 and will only be low when IORQ, WR and A13 are low. E2 (active low) is tied to ground and is permanently low. E3 (active high) will be high whenever A15 is high.

Since we are only looking at the low seven ROMs we need only decode D0 to D2 as ROM numbers. However, D3 must be taken account of for a 6128 where the CPC's routine looks for ROMs numbered fifteen and down. If it were ignored then ROM one, for instance, would also be found at ROM nine since D0 to D3 would have the same logic levels for both numbers and the ROM would be initialised twice.

Finally, when all these signals have been decoded and our selected ROM is

change level before E1 then the chip will be disabled but the output won't be latched.

Right then - a quick run through of the circuit. When IORQ goes low an I/O address is on the bus and IC1a is enabled. Only one of its four outputs is low at any one time and which output depends on the address presented to its A0 and A1 inputs. When WR and A13 are both low then output zero goes low providing the required low enable signal to IC1b.

Similarly, this decoder will now reflect the address present on A0 and A1 by a low on one of its four outputs. A1 is grounded and is always low but A2 is fed by D3 and will be low when D3 is low. Therefore the zero output will be low when D3 is low. i.e. when the ROM number being enabled is below eight.

This zero output is now used to enable IC2. E2 is grounded and is

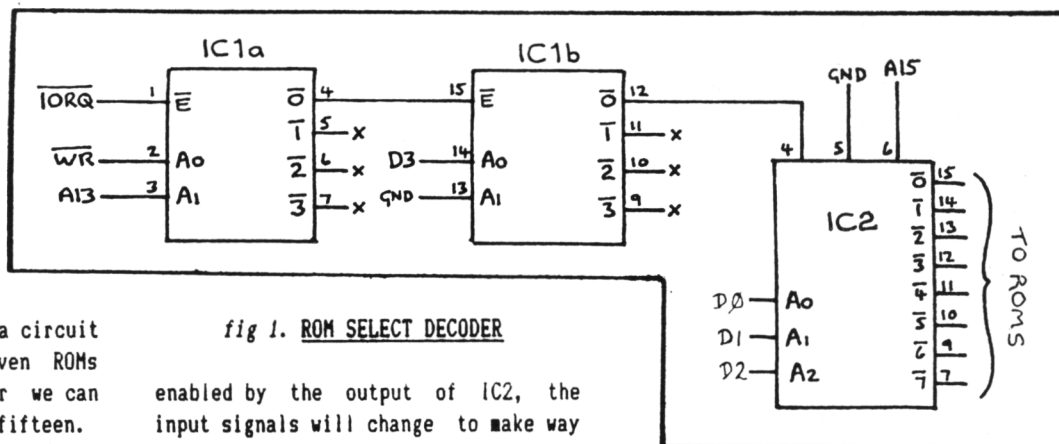


fig 1. ROM SELECT DECODER

enabled by the output of IC2, the input signals will change to make way for ROM read operations and such. Now we need to make sure that we don't lose IC2's enabling output, otherwise, as soon as the input signals were changed, the output would go high and our ROM would be disabled and that wouldn't do.

If we used the more common 74LS138 three to eight decoder, then the signal would last as long as E1 and E2 remained low and E3 stayed high. IC1's low output is lost upon this change but we don't need to keep that one - we do need to keep IC2's low output. The three to eight decoder we are using for IC2 is a "latching" decoder which means that its output remains after it has been disabled by change of E1 from low to high. If E2 or E3

always low and A15 went high when A13 went high. So E1 going low is the final signal which enables IC2. One of its eight outputs will be latched low according to the address on its A0 - A2 inputs. This address is, of course, the ROM number.

Now we have eight output lines from IC2, each of which will go low according to a selected ROM number and can therefore be used as low enable lines for eight different ROM chips. This is what I meant by a ROM being physically located at its number by hardware.

*I am somewhat hesitant to say that we will see how the ROMs are connected next month but that is my intention.*

From **NEMESIS** (The Original Meddlers)

### ≡ **BONZO SUPER MEDDLER** ≡

The dedicated tape to disc utility for any CPC  
(including the devastating **BONZO'S HACK PACK**)

**THE FACTS:** BONZO SUPER MEDDLER IS GUARANTEED TO TRANSFER MORE GAMES THAN ANY OTHER PROGRAM; THE FIRST PERSON TO FIND A MORE SUCCESSFUL PROGRAM WILL RECEIVE **THRICE** THEIR MONEY BACK!

**MORE FACTS:** BONZO SUPER MEDDLER DOES NOT USE A MASSIVE HOST PROGRAM TO RUN THE TRANSFERRED GAMES. ALL TRANSFERS "STAND ALONE".

\* **BONZO USES LESS MEMORY, TRANSFERS MORE, \*  
COSTS LESS, AND GIVES REAL SUPPORT TO THE USER.**

\* **WELL OVER FIVE HUNDRED CONFIRMED TRANSFERS \*  
BSM+HACKPACK - £12.50 disc**

### NEW ≡ **BONZO'S BLITZ** ≡ NEW NEW SPEEDLOCKS TO DISC

*XEVIOUS, ARKANOID, TOP GUN, SCRABBLE, GRAND  
PRIX SIMULATOR, BMX SIMULATOR, SHORT CIRCUIT,  
FREDDY HARDEST, WORLD SERIES BASEBALL, etc...*

NO PROBLEM - Just one keypress - £12.50 DISC.

**NEMESIS (WCI), 10 CARLOW ROAD  
RINGSID, KETTERING, NORTHANTS NN14 4DW**

\*  \* ACCESS ORDERS PHONE (0433) 62367 \*

## Super's Scoops

### COMMS TERMINALS

ALL YOU NEED TO GET  
ON LINE. FULL KEYBD  
AND AUTO-DIAL. PLUG  
INTO PHONE LINE+TV  
TO ACCESS BULLETIN  
BOARDS, PRESTEL, ETC.

only £22

DETAILS  
FROM   
**PHIL CRAVEN**  
212 Dudley Hill Rd  
BRADFORD, BD2 3DF  
Phone: 0274 636652

### software

I have a quantity  
of used games and  
utilities on disc  
and tape. All are  
originals and  
guaranteed.   
Send for list.

### ROMBOARD KIT

\* 7 SOCKETS \*  
FULL KIT...£15  
READY MADE...£20  
PTD COT BRO...£5  
INC. INSTRUCTIONS

# CAMEL COMMENT

WHO SAID THE CPC WAS  
DEAD? WE DON'T THINK  
SO, OTHERWISE WE  
WOULDN'T BE PUTTING  
SO MUCH EFFORT INTO  
NEW SOFTWARE

## TAKE A LOOK AT

# WOPS

OUR NEW WINDOWS OPERATING SYSTEM (disc). IT'LL  
PUT SALT ON YOUR CHIPS AND LEAVE THE COMPETITION  
STANDING. ALL THOSE UTILITIES YOU HAD TO BUY  
SEPARATELY ARE NOW IN ONE INTEGRATED SYSTEM  
WITH EASY-TO-USE ICON/POINTER CONTROL (NO MOUSE  
NEEDED) AT A PRICE YOU COULD EASILY PAY FOR  
JUST ONE UTILITY, AND WITH A LOT OF EXTRA THINGS  
YOU WILL COME TO FIND INDISPENSABLE, AND WHICH  
ARE UNIQUE TO WOPS. WE CAN'T LIST EVERYTHING,  
BUT HERE ARE A FEW OF WOPS' FUNCTIONS:-

BACKUP 99% OF "FUNNY" FORMAT DISCS. FAST FORMAT.  
EXTENDED FORMATS. ICON/POINTER SELECTION. DISC TO  
TAPE ARCHIVE WITH DATA COMPRESSION (ANY FORMAT).  
DISC SECTOR EDITOR WITH TRACK & FILE MAPPING.  
SEARCH OPTIONS. FAULTY SECTOR RECOVERY ETC (ANY  
FORMAT). FULL-SCREEN TEXT EDITOR. TRANSFER ANY  
TYPE & LENGTH OF FILE BETWEEN TAPE & DISC. ERASE  
AND UNERASE FILES. FULL PRINT/LIST OPTIONS. 1 OR  
2 DRIVE SUPPORT. AUTODETECT SWAP ON SINGLE DRIVE  
(NO MORE "PRESS A KEY" - WOPS CAN DETECT THE  
REMOVAL & INSERTION OF A DISC). CONTROL PANEL.  
MULTIPLE FILE COPY WITHOUT MULTIPLE DISC SWAPS  
ON SINGLE DRIVE. FULL DIRECTORY (NOTHING HIDDEN)  
EASY CHANGE OF FILE ATTRIBUTES (READ-ONLY, ETC).  
MINIMISED KEYBOARD INPUT. MINIMISED SWAPPING ON  
ONE DRIVE. ONE-PASS DISC COPY WITH MANY DISCS.

WOPS IS WRITTEN BY CAMEL MICROS, AUTHORS OF  
DISCOVERY PLUS & GENESIS. EXISTING USERS WILL  
KNOW THAT WE BEND OVER BACKWARDS TO GIVE SUPPORT

## WOPS £14.95

GENESIS .. Cass 9.95 - Lev1 16.95 - Lev2 22.95  
DISCOVERY PLUS .. Disc 12.95 (PRICES INC POST)

## CAMEL MICROS

≡ **WELLPARK, WILLEY'S AVE** ≡  
≡ **EXETER, DEVON, EX2 8BE** ≡  
≡ **PHONE (0392)211892** ≡

# TURBO-CHARGE YOUR AMSTRAD

## WORD PROCESSING

### PROTEXT

Protex is without doubt the most sophisticated word processor you'll find on any home micro. Its ease of use and advanced range of features are normally only found in business systems costing many times more. Widely praised throughout the Amstrad press, Protex is rightly acclaimed as the No.1 word processor for Amstrad CPC owners.

- \* Super fast \* Works with any printer \* Flexible find and replace \*
  - \* Layout stored with text; normal & decimal tabs, left & right margins \*
  - \* Word count \* Versatile print options; incl. headers/footers, page nos. \*
- "Extremely powerful editing features ... superb search and replace" AA*  
*"I can't emphasise how good it is" PCW*

**MACCI PRICES: Rom £31 Disc £21 Cass £15**

### PROPELL

Typing and spelling errors are simple to make and frustrating to miss. But by using Prospell, you can produce documents that are error-free. Prospell is an automatic spelling checker that points out any odd words or dubious spellings.

- \* checks Protex text in memory \*
  - \* checks file on disc from Protex/Tasword/Amsword/NewWord/WordStar \*
  - \* over 33000 words \* room for thousands more \* up to 2000 words/min \*
  - \* find words and anagrams - great for crosswords \*
- "Fast, efficient, easy to use" YC*

**MACCI PRICES: Rom £27.25 Disc £19.50**

### PROMERGE

More than just simple mail merging for multiple standard letters!

- \* integrates perfectly with Protex \* read data from keyboard or file \*
- \* conditional printing to create personalised letters \*
- \* use the built in maths functions to produce invoices etc \*
- \* microspacing - to even out the spaces between words \* typewriter mode \*
- \* link files together at print time \* Reformat while printing \*

**MACCI PRICES: Disc £19.50**

### PROMERGE PLUS

All the features of Promerge, plus:

- \* Edit two separate files in memory at once; copy blocks between them \*
  - \* Background printing - allows you to print and edit at the same time \*
  - \* Box mode - cut and paste any rectangle to create newspaper columns \*
- "You'll have a set-up that can thrash any 8-bit word processor for speed...and even some 16-bit programs for power" PCW*

**MACCI PRICES: Rom £27.25**

### UTOPIA

50 new commands available without having to load a program, including:

- \* Text screen dump \* Graphics screen dump to Epson compatible printer \*
- \* disc utilities - disc format and copy, copy files, sector editor \*
- \* useful function keys automatically set up; easily define your own \*
- \* BASIC programming utilities \* ROM management commands \*

*"UTOPIA is by far the best utilities rom...it's worth buying a rom board just to plug it in" AMSCLUB*

*"Utopia seems to be in a class of its own" AMTIX*

**MACCI PRICES: Rom £23.25**

### ROMBO

All rom software requires a rom expansion system. Its benefits include zero loading time and maximum memory available for text, data, programs etc. Remember; Utopia and the extra commands of Promerge Plus are not available on disc. Fits CPC464/664,6128.

**MACCI PRICES: 8 socket rom box £27**

## CPC 464/664,6128

### MAXAM

The classic Assembler/Monitor/Editor for developing Z80 machine code.

- \* Plain English error messages \* Disassembler \* Memory editor \*
- \* Menu driven full screen editor \* load/merge/save/print/find/replace \*
- \* Mix BASIC and machine code \* or assemble directly from editor \*
- \* Use the editor to edit BASIC programs saved in ASCII \*

*"This piece of software should be held up as an example of what can be done by programmers who care ... buy one now!" E & C*

**MACCI PRICES: Rom £31 Disc £21 Cass £15**

### BCPL

Flexible, fast, general purpose programming language.

Comprehensive I/O libraries including graphics and sound.

Example source files supplied, including a space invaders game, full screen editor and all the libraries. 60 page manual covers the language and gives details of the libraries.

*"Designed for humans, not computers" CWTA*

**MACCI PRICES: Disc £19.50 Rom £23.95**

### MODEL UNIVERSE

Create and print your own designs in three dimensions. Zoom into your object, rotate it through 360 degrees or view from any angle or perspective

*"An ideal introduction to the world of 3D graphics" CWTA*

**MACCI PRICES: Disc £15 Cass £12**

### C (6128,CP/M+)

Integrated C programming system. Full implementation of K&R standard.

- \* Floating point \* 32 and 16 bit arithmetic \* Optimising compiler \*
- \* Linker \* I/O and maths libraries \* Conditional compilation \* Macros \*
- \* Editor is program mode of Protex \*

*"In typical Amstrad fashion, they've taken their time and got it right" AU*

**MACCI PRICES: Disc £39**

### MAXAM II (6128,CP/M+)

Enhanced version of Maxam for CP/M+. Extras include:

- \* Single stepping \* conditional breakpoints \* symbolic debugger \*
- \* Editor is program mode of Protex \* Macro assembler \*

*"Now the best gets even better" CWTA CPC*

*"Maxam II - others nil" AU*

**MACCI PRICES: Disc £39**

### POCKET PROTEXT (6128,CP/M+)

An enhanced version of CPC Protex running under CP/M+ with:

- \* unlimited file size \* foreign languages, accents on any letter \*
- \* microspacing to give equal spacing between words \* two file editing \*
- \* proportional printing with right justification \* disc utilities \*

*"Deserves to be the system by which all other WPs are judged" YC*

**MACCI PRICES: Disc £23.25**

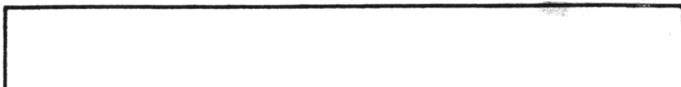
### PROTEXT (6128,CP/M+)

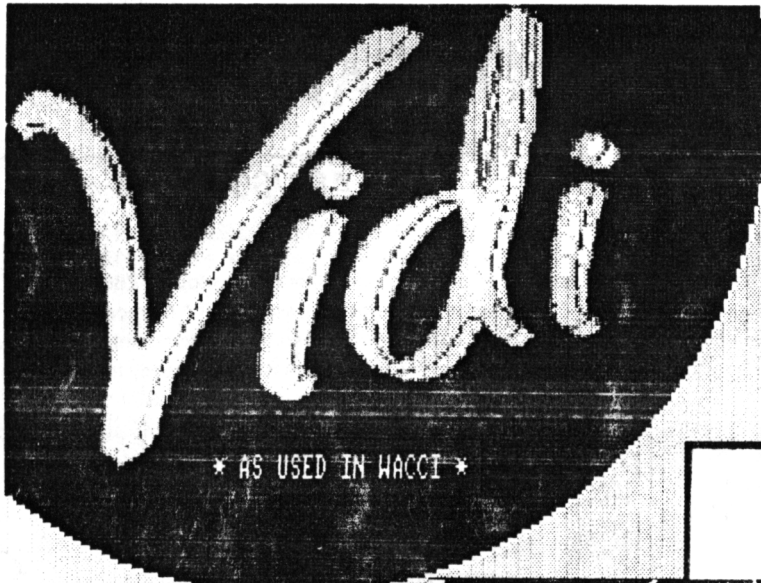
Combines all the features of Pocket Protex, Promerge Plus and Prospell into one program. German program and dictionary also available (Prowort).

Protex is also available for IBM PC compatibles including Amstrad PC1512/PC1640 at the same price.

*"Protex is just so fast and versatile once you have used it - it is like putting Nigel Mansell against a C5" PYATW*

**MACCI PRICES: Disc £47**





The  
VIDEO DIGITISER  
From  
**ROMBO**  
PRODUCTIONS.

For CPC  
464/664  
6128



**V**ideo **I**mage **D**igit**I**ser

SPECIAL WACCI PRICE

**£68**

*VIDI is a Frame Grabber.* You don't need a still picture! – grab 'action shots' from camera or video.

*VIDI is Fast.* Upto six frames a second.

*VIDI is flexible.* Brightness or Contrast is keyboard controlled.

*VIDI prints* superb A4 or A5 size shaded screens to EPSON compatible printers.

*VIDI comes complete* – with software on Disc. Manual and video lead

ONLY AVAILABLE AT THIS LOW PRICE FROM:

**WACCI**

59 THE GREEN  
TWICKENHAM  
MIDDLESEX TW2 5TU

**THE ROMBO ROM BOX**  
8-SOCKET ROM BOARD

SPECIAL WACCI PRICE

**£27**

All prices include VAT  
and postage & packing

Special WACCI prices  
for limited period only