

COMPUTING WITH THE AMSTRAD

The independent magazine for Amstrad computer users

**music
micro
please!**

Orchestrate your Amstrad



Free pull-out supplement

Gunpowder Plot – a cracker of a game
Giving your programs the third dimension
Reviews: Nevada Fortran, Box disc drive

128 pages!
The biggest Amstrad
magazine yet

A PROCESS OF WORD PROCESSING

Are you 100% delighted with your Word Processor?
Have you got any choice?

Well until now, perhaps not, but read on because we have some interesting facts for you. We have tested some of the more popular word processors for the Amstrad PCW machines and we have presented a fairly comprehensive listing of our findings. Use this information freely, before you decide on your next Word Processor.

A Comparison of Amstrad Word Processors

Benchmark timings

All tests were carried out on a standard 1817 word document. Tests 7 to 10 were carried out on a standard 262 word paragraph. All times are in seconds.

	Protext	Look-see! 5000	Typeword 8000	Newsword	Rocket Wordstar Discus
Version:	3.00	1.30	1.00	2.17	3.00
Computer:	PCW8256	PCW8256	PCW8256	PCW8256	PCW8256
1. Load document	6	12	8	18	10
2. Save document	7	84	16	10	16
3. Merge document to middle of text	5	209	11	21	1
4. Move cursor from start to end	0.5	34	5	5	-
5. Move cursor from end to start	0.1	15	3	4	3
6. Replace 'the' with 'THE' 200 times	5	128	281	73	208
7. Format paragraph	1	10	12	5	5
8. Move paragraph to start	0.2	42	13	5	2
9. Move paragraph to end	1	80	12	5	4
10. Delete paragraph	0.3	19	3	4	4

"I am stunned by the speed at which Protext performs the text operation, there is nothing like it on the Amstrad..." **AMTIX MAGAZINE**

"Protext can thrash any 8 bit Word Processor for speed and can even cross words with some 16 bit programs for power!" **POPULAR COMPUTING WEEKLY**

PROTEXT WORD PROCESSOR

Q: So why is Protext so much faster than the competition?

A: Protext is the "state of the art" on the Amstrad computers. After two years of development, it is now widely recognized as the "new standard" by which other programs will be judged. Protext is not just another conversion from other computers but a complete word processing system designed and written specifically for the Amstrad range. Protext makes full use of the available features on your machine, taking it further than ever before in many respects. It is different using the speed, power and performance, which until now had not been thought possible. Protext is a fully integrated package complete with extensive mail-merge routines, spelling checker and disc utility programs.

But speed is not everything, so to be fair we should also show a summary of the main features. . . .

OF ELIMINATION

G: THE FACTS EXPOSED

Feature comparison

FEATURES	Protect	Com-sport	Standard 8000	Standard	Protect Windows Deluxe
What you see is what you get	Y	Y	Y	Y	Y
Sticky roll-in printer	Y	Y	Y	Y	Y
Print-out file save	Y	Y	Y	Y	Y
Two file editing	Y	Y	Y	Y	Y
Auto-reformat	Y	Y	Y	Y	Y
Custom commands stored in text	Y	Y	Y	Y	Y
Spooling check-out	Y	Y	Y	Y	Y
Spell check from within edit	Y	Y	Y	Y	Y
Multi-window systems	Y	Y	Y	Y	Y
Background printing	Y	Y	Y	Y	Y
Insert or overwrite	Y	Y	Y	Y	Y
Online file command	Y	Y	Y	Y	Y
On screen help	Y	Y	Y	Y	Y
Dynamic screen updating	Y	Y	Y	Y	Y
Resizers and lockers	Y	Y	Y	Y	Y
- Aspect ratio and page	Y	Y	Y	Y	Y
Sort - (Y/N/P)	Y	Y	Y	Y	Y
Sort - alphanumeric	Y	Y	Y	Y	Y
16K/32K/64K	Y	Y	Y	Y	Y
Optional font	Y	Y	Y	Y	Y
Printed whole document	Y	Y	Y	Y	Y
Page length indication	Y	Y	Y	Y	Y
Respective number status	Y	Y	Y	Y	Y
Output concatenation	Y	Y	Y	Y	Y
On-line replace mode	Y	Y	Y	Y	Y
Mailboxes - 40 files	Y	Y	Y	Y	Y
Clipboard	Y	Y	Y	Y	Y
File lock	Y	Y	Y	Y	Y
Clipboard	Y	Y	Y	Y	Y
Color printer modes	Y	Y	Y	Y	Y
Color selected pages	Y	Y	Y	Y	Y
Block block	Y	Y	Y	Y	Y
Find in screen	Y	Y	Y	Y	Y
Clipboard	Y	Y	Y	Y	Y
Typewriter mode	Y	Y	Y	Y	Y
Change printer at any time	Y	Y	Y	Y	Y
Subfiled printer modes	Y	Y	Y	Y	Y
Non translated characters	Y	Y	Y	Y	Y
Turn off printer mode headers	Y	Y	Y	Y	Y
Display return/line	Y	Y	Y	Y	Y

FEATURES	Protect	Com-sport	Standard 8000	Standard	Protect Windows Deluxe
On a page underlining	Y	Y	Y	Y	Y
Built in Postscript emulations	Y	Y	Y	Y	Y
Support graphics	Y	Y	Y	Y	Y
Calculator type	Y	Y	Y	Y	Y
Details file	Y	Y	Y	Y	Y
Remove file	Y	Y	Y	Y	Y
Copy file	Y	Y	Y	Y	Y
Printed file	Y	Y	Y	Y	Y
Print screen file	Y	Y	Y	Y	Y
Auto file backup	Y	Y	Y	Y	Y
Print replace - subfiles	Y	Y	Y	Y	Y
- selection of all	Y	Y	Y	Y	Y
- ignore case in mail	Y	Y	Y	Y	Y
- search for a/b printing	Y	Y	Y	Y	Y
- search for numeric status	Y	Y	Y	Y	Y
- list file attributes	Y	Y	Y	Y	Y
Mail merge - data from the	Y	Y	Y	Y	Y
data from keyboard	Y	Y	Y	Y	Y
- selection variable	Y	Y	Y	Y	Y
- concatenation - expressions	Y	Y	Y	Y	Y
- header attributes	Y	Y	Y	Y	Y
- programming operators	Y	Y	Y	Y	Y
- multiple data files	Y	Y	Y	Y	Y
Conditional printing	Y	Y	Y	Y	Y
- nested	Y	Y	Y	Y	Y
Repeat-print loops	Y	Y	Y	Y	Y
Insert file while printing	Y	Y	Y	Y	Y
System wide printing	Y	Y	Y	Y	Y
Auto address/printer selection	Y	Y	Y	Y	Y
Setup links together	Y	Y	Y	Y	Y
Mailboxing	Y	Y	Y	Y	Y
Postscript output	Y	Y	Y	Y	Y
Built in word count	Y	Y	Y	Y	Y
Character count	Y	Y	Y	Y	Y
File markers	Y	Y	Y	Y	Y
Comments within text	Y	Y	Y	Y	Y
Program editing mode	Y	Y	Y	Y	Y
Works ASCII file	Y	Y	Y	Y	Y
File compression utility	Y	Y	Y	Y	Y
Scan defaults: macrostream	Y	Y	Y	Y	Y

Amstrad Ltd. September 1988

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Protect is available from Amstrad Limited. We do not stock the others!



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MASTERFILE III

FOR THE AMSTRAD CPC 6128 (ALSO CPC 464/664 WITH DK TRONICS 64K RAM)

RATHER ENHANCED ...

We are pleased to announce the third major issue of MASTERFILE. This is no mere update, but a thoroughly enhanced and streamlined re-design of MASTERFILE 128, packed with new features, and a delight to use. We included some of the best ideas which our earlier MASTERFILE customers contributed. We sent prototypes out to our eager "beta" users, and they looked it as hard as they could, and came up with even more ideas. We spent several weeks further honing MASTERFILE III. Then we sat down and totally rewrote the manual.

SOMEWHAT POWERFUL ...

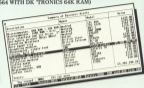
For the benefit of newcomers to the CPC machines, MASTERFILE III is a very powerful and flexible data filing and retrieval system. All "database" systems require that your data is organized into fields and records. But unlike most, MASTERFILE does not constrain you to field lengths or formats, since ALL data is a variable-length and optional. Files are not pre-formatted, and only used bytes are used to disc. Also, unlike the rest, MASTERFILE allows multiple user-defined ways of viewing/printing your data. And unique to its price range, MASTERFILE offers RELATIONAL FILE options, whereby common data can be entered just once and shared by many records. Maximum field size is 248, maximum fields per record is over 50, and maximum file size is 64K. Room for 1,000 full names and addresses, for example. Only one disc drive is required. It is menu-driven throughout, and comes with detailed illustrated manual, and example files.

EVER SO FAST ...

Just about ANY kind of information can be handled by MASTERFILE. You can Export the data to other systems (e.g. PROTEXT/MERGE and TABWORD). You can even merge your own USER BASIC to MASTERFILE for customised file processing. You can build new files from other sources - e.g. transfer data from Spectrum MASTERFILE. The speed of Search of MASTERFILE is second to none. We've even got calls from customers who say that "The search did nothing"; they simply blinked and missed the revised status saying how many records had been found! Records can be sorted ascending/descending, character or signed numeric; even embedded keys such as surnames. We simply don't have room to list all the features; give us a call if you are still in doubt of the power of MASTERFILE III.

PLEASEINGLY PRICED ...

How much does it cost? Just £29.95. Our test customers all say this is far too low - but then we didn't change them this! However, we appreciate that many of you are "home" users who do not want to pay a "business" price. So we kept to a realistic figure. But don't be fooled by the low price. This is no toy written in Basic, nor is it a handiering CP/M dinosaur. This is real machine-coded computing power. We have had IBM and Apple users beg us for a MASTERFILE for their machines - when they had seen the earlier CPC MASTERFILE. They are going to be more fra-



tried now. So see the PCW gladders. Also, many of you pay a lot more, because you buy one database after another before you throw them all out for MASTERFILE. The trick is to ask around, read the reviews and choose MASTERFILE III first time. Try telephoning our competitors and ask to speak to the programmer for technical information. Then try us. We think you will spot the difference!

For those of you who already have an earlier MASTERFILE, we tempt you with some of the extras that "III" has:

Three Times faster disc load/save than MASTERFILE 128/II. Twice the screen speed. Total +/- values. Merge all/selected. Save all/selected. Disc file menu options. Implicit record numbering, both physical and selected. GOTO selected record number. Simpler but more powerful search. Full data name prompting. Print report width up to 160 columns. Page numbering. Insert records anywhere. Record Cursor for direct update within a display page. Smart new text editor. Format printing. Extended User Basic options. Compatible with all earlier CPC MASTERFILE files. Field-to-Field Calculations.

MASTERFILE III complete costs £29.95. We can provide an UPDATE onto your original MASTERFILE 464/128/II disc for £19.95 - inclusive of the new revised manual. If your original MASTERFILE 464 is on tape, we ask £22.95 for the exchange.

We also have one of the fastest and friendliest spreadsheet programs around, MASTERCALC 128. For this we ask £29.95. But as a SPECIAL OFFER to customers who buy MASTERFILE III complete and MASTERCALC 128 together, we offer the spreadsheet at £19.95, just £29.95 (£52.95 in total for both programs.)

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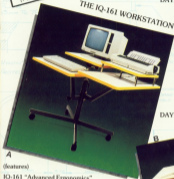
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THE IQ-161 WORKSTATION



A

(features)

IQ-161 "Advanced Ergonomics"

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Printer Table 30" (20cm)
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Adjustable Paper Management
Tray

Chromed Pillar
Stretches, double surface,
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150°/180° Dual-Screen surface
-tilts (15 degrees) down &
back (rotated with ambient
light conditions) 45°-60cm

Special Rotation - when
rotated "push back"

Prevention of leg obstruction

Heavy-duty chromed pillar to
carry 4" lower VDU monitors
20cm

Keyboard surface (rotates down
& locked 20°-60cm)
Support arms - with height
adjustment

Table space for mouse
(optional, protect front)

Preventational rotation (to avoid
permanent spring for perfect
balance)

Quality (steel) frame
designed

Heavy-duty casters (cast
for lock)

See us at the **Amstrad
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Newport, London
October 2-3**



B

IQ-161 with optional side table EX/L
(optional drawer fits under
table surface)

- DAY 1 - We gave some of our bright design & engineering minds this task:
- (Come up with) the "desk" for the 21st Century NOW!
 - Design it for the human requirement - ergonomics: seating position, viewing angles, height adjustments
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 - Build it well, strong and with precision - so it will last
- And most daunting of all - (in view of the foregoing brief)
- Allow us to sell it for under £100!
- DAY 161 - They did it! and we named it the "IQ-161"

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Just 698* you get the IQ161 Workstation including the Printer Table (as in picture A)
All you need for your AMSTRAD 8256/8512 or similar systems!
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Optional side table EX/L					
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Optional printer table with drawer EX2					
Optional side table EX/L					
Optional drawer for under table surface					
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Now Digital Research, creators of the CHM operating systems that make this graphics capability possible, offer you two professional-graphics software packages which exploit it to the full: DRGRAPH and DR DRAW.

Data comes alive with DR GRAPH £49.95.

DR GRAPH lets you use data entered manually or created with popular spreadsheet programs such as SuperCalc to design vividly effective and professional line, bar, scatter and stick graphs, and pie and text-only charts, quickly and effortlessly.

Simply choose options from menus and by filling in a form.

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Choose from three different type styles (plus your mad line type) for titles, legend and annotation copy. Deploy different line styles, line and bar widths and eight filled patterns to add clarity and emphasis. Add borders, colour and labels. Bar charts can be stacked, clustered, or arranged in steps or "steaks". Pie charts can include exploded "slices".

Annotation can be incorporated, modified, or removed anywhere you want. Different graph types can be combined with one chart, and as many as four different charts or graphs can be combined on a single page.

Ideas become art with DR DRAW £49.95.

DR DRAW lets you create organization charts, flowcharts, business logos, technical diagrams, maps. Or just about any shape or line drawing imaginable.

And each element can be enhanced or highlighted with a variety of colour, and patterns.

Easy-to-follow menus let you select pre-programmed shapes—circles, bars, arcs, rectangles, polygons, and lines—or create your own pictures by modifying these shapes via mouse or keyboard. Add text anywhere you wish, selecting between a wide variety of type font styles.

Revise with the stroke of a key. Fill a shape with colour or patterns.

Enlarge or reduce it. Move it to a new location or copy it.

Change type font, size, colour, and location with just a few simple keystrokes.

Zoom in for detailed work, then zoom back out

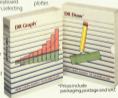
to view the entire picture. Or zoom out to fit your picture neatly in a 8½" x 11" or 11" x 8½" page layout. Or extra-large drawings; you can pan the screen back and forth over each section.

See, store, print, present!

DR GRAPH and DR DRAW let you see exactly what you've designed on screen. Then store it on disk for recall or update later. Or print or plot on paper or overhead transparency film.

Either way, you've got a totally professional presentation.

Both packages run on Amstrad CPC 6128 or PC16128 computers with one or two disk drives. Hard-copy can be produced on any GDI-compatible printer or plotter, such as Amstrad Epsion or Shiva printers and the HP 2470A plotter.



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The creators of CHM



Alan Sugar presents the PC 1512

What the papers said

Former boss of Alan Sugar has revealed that he aims to beat the world's biggest computer firm at its own game.

Sugar, an entrepreneur and inveterate marketing genius, said IBM could not hope to match the low overheads of his operation.

— Today

Amstrad's move into the IBM compatible market will be an even more ambitious affair than even the most expensive models observers had forecast.

Production figures suggest Amstrad is going for sales of almost twice the 600,000 generally expected for the first year.

— Daily Telegraph

If the success of Alan Sugar's Amstrad company is anything to go by, other firms' mistakes may have been to manufacture in Britain and indulge in lawsuits like Japanese research and development.

If he succeeds in his plans to produce nearly a million of the new machines a year, Mr Sugar will have become the Henry Ford of the industry, bringing serious computing to the masses.

— The Guardian

WAITING LIST FOR THE PC1512

ORDERS for the Amstrad PC1512 are flooding in—but it will be the middle of November before most customers are able to put fingers to keyboard in their own offices.

Dixons, the only High Street chain selling the new machine, has ordered 30,000 units.

But the firm had to pay out of its own pocket to fly in demonstration machines in readiness for post-launch customer responses.

Potential buyers are being told they will have to go on a waiting list until bulk quantities of the machines arrive by sea from the Far East.

The official line, from Amstrad boss Alan Sugar at the launch, was "availability in the first week of September".

But a survey conducted by Computing with the Amstrad revealed the closest to that date Dixons would come was mid-October, and that was only for customers at the main London store.

£50 deposit

Outside the capital mid-November was the date most often quoted, with no guarantee that all orders would be filled by then.

At the end of September Dixons in London were taking orders on a £50 deposit

promising delivery in two to three weeks.

In Birmingham they were asking for a token deposit and talking of six to eight weeks delivery on a first come first served basis.

In Manchester it was again a case of six weeks minimum wait, but with only £5 deposit. All Dixons stores surveyed reported an enthusiastic welcome for the new PC.

A spokesman said this was due to favourable reaction from the general and computer media and Dixons major advertising spend in the national press.

The ads trumpeted Dixons achievement in being the first retail outlets to demonstrate the new machines.

Dixons are offering the PC and "paper-white" monitor with single disc drive for £299, with twin drive for £499, with 10mb hard disc for £899, and 20mb hard disc for £799. Colour monitor packages were £200 more.

With Dixons and leading Amstrad distributors unable to promise PCs for sale until well into the autumn, the picture was

even bleaker for the small retailer.

One told Computing with the Amstrad: "I hear on the grapevine that it could be as much as 12 to 18 weeks before shops like mine are able to sell PCs over the counter".

Super printer

AMSTRAD is currently working on an enhanced printer for the PCW range.

First details of the machine came from company chairman Alan Sugar in reply to criticism of the existing model.

He revealed it will be a 24 pin head dot matrix printer providing "perfect letter quality".

At the same time, Amstrad's chief executive announced a new carbon impregnated ribbon — "the best ever" — will soon be available for the PCW.

Program 'on to a winner'

A PROGRAM for the PCW512 is likely to send bookmakers hunting for cover once it is released.

For it claims to have an 85 per cent success rate in picking winners of horse races.

KDS Interactive Software — the company behind the package — insists that the bookies are in for a scolding from Amstrad owners.

"We really believe that this will give them something very serious to worry about", said KDS boss Cliff Walden-Goodwin.

The software house believes

it is on to a winner because of its expertise in rule based systems.

In all, there are 95 rules forming the basis of its alleged betting coup. Users are asked to provide data ranging from the locations of the meeting to the previous days and past price forecast.

Once this is completed, the PCW will predict the winner. Or if it hasn't enough information to guarantee which horse will be first past the post, it provides two or three selections to enable the punter to hedge his bet.

Cliff Walden-Goodwin says his company developed the

program with the aid of a well-known professional gambler who lives "just outside Newcastle".

But if the program can in fact pick the winners why is he preparing to let everyone else get in on such a lucrative secret — even if the company is going to charge around £100 for the privilege?

"I've always had a bit of a flutter myself", said co-developer paperman Cliff. "So it will give the great satisfaction to see the bookies taken to the cleaners for a change."

"And don't worry, I intend to see the system myself."

DODGY DOINGS IN DOCKLAND

DODGY Gasters, a graphic adventure set in the docklands underworld, is the latest offering for the CPC range from Melbourne House.

It is divided into two parts which can be played as separate games.

Fresh from a three year stint behind bars you are out for revenge against the grass who lured you there who is now a

respectable bank employee.

Choosing to kill two birds with one stone you decide to rob his bank. Strategy and the gathering of information is crucial to solving the variety of plots and subplots.

The game is written in cockney rhyming slang, comes with an audio recording of the theme song and is available on cassette for £8.95.



Dodgy Gasters authors Trevor Lever and Peter Jones

A touch of the Guy Fawkes

CITY Slicker and Farstad are now to be released for the CPC range from Heaven.

In the first you play a counter intelligence agent out to foil a plot to blow up the Houses of Parliament.

The game recreates the atmosphere of London with a mixture of realistic and caricature representations of landmarks and people. It costs £8.95 on cassette, £14.95 on disc.

Farstad, written by 1985 programmer of the year Steve Crow, is an arcade/adventure game set in the medieval land of Yarn.

Deadly

As gaffers might be Galahad! you must save the populace from the treacherous queen and her deadly fiend.

This you achieve by gathering the elements of the spell of eternal youth and testing it for the firestone, while avoiding random fireballs and a variety of menacing characters.

Features include over 100 screens displaying the traditional landscape and personalities of the middle ages, and the ability to cheat in trading. Price £14.95 disc, £8.95 cassette.

More desktop products on their way

SEVEN new products are in the pipeline for the Amstrad range from Advanced Memory Systems.

They are all connected with either office or desktop publishing - areas in which the company is already well established with its AMX Mouse and Papermaker package.

aimed at the CPC markets is a graphics extension to the disc filing system called Max - The Desktop.

It provides a front end WIMP environment with a wide range of disc management operations.

Disc cataloguing into a window of up to two-disc drives is possible with the catalogue presented in icon form and sorted by name, file, type and length. Files can be executed in

basic and machine code and their details displayed.

They can be deleted, renamed, protected or unprotected, copied between drives, dumped and listed.

There is a control panel for the selection of screen colours, keyboard delay and repeat rates, mouse sensitivity and the mode entered upon leaving.

Compatible with keyboard, joystick or mouse, Max - The Desktop also offers a Help and Note Pad facility. Price: £18.95.

On the PCW front, AMS is to launch Stop Press, a new version of the Page maker

desktop publishing package, price £48.95.

Carousing a typesetter, graphics and word processor on two discs, it handles itself to letters, posters, menus, in fact anything that needs to be created on A4 size paper.

Also to be released shortly for the PCW 5250 and 8512 is the AMX Mouse, price £79.95.

"We believe that a major market is developing for both retail and desktop publishing," says Nick Pearson of AMS.

"And we are convinced that the lion's share of the demand will come from Amstrad users".

Flying fists

SEVEN to be released for the Amstrad is Melbourne House's Part 2: The Legend Continues.

This combat game features continuous fighting and fast scrolling action set in a dynamic, mappable landscape.

Partic players face include ninjas, shotguns and savage animals.

On cassette at £8.95.

Logical approach

A RANGE of leisure software for the PCW has been launched by PCW Soft, a subsidiary of CPC.

First out is a suite of four programs that aspire to develop logical thinking and strategic planning, as well as provide fun and relaxation.

Merchant is a trading game for two to six players and

Fantasy Quest a role playing game in the Dungeons and Dragons format.

In Mountain Leader the player must successfully organise a climbing expedition, and Speculators offers them the opportunity to become a millionaire.

Price of individual programs is £9.95, with the complete set available at £35.

LISTINGS GO ON-LINE

All program listings in Computing with the Amstrad are now available for free downloading on MicroLink, the UK's fastest growing electronic mail service. They join hundreds of programs already available on Britain's national on-line database.

BASED on the original Brian Stoker novel, Dracula from CPL for the Amstrad CPC range features digitised graphics. Price £7.95.

GAMES BRIEFS

FOUR classic adventure games from Mirosoft have been compiled on one disc for CPC and PCW machines.

They are The Test of Arnold Blackwood, Arnold Goes to Somewhere Else, The Wise and Fool of Arnold Blackwood, and Bazaar Free.

The disc also includes hints and tips, and even cheat sheets for each game. Price of the CPC version is £13.95, PCW version £18.95.

DEBTY Den and all the other characters from the popular soap opera *Landers* are to feature in a new game for the CPC range from BBC Enterprises.

The program is being developed by Mosaic Software and is expected to be in the shops before Christmas priced under £10.

ARCAGE combat adventure Tarzan Lord of the Jungle from Mirosoft will be launched this month for the CPC range.

Set in the sprawling jungles of Africa the game concerns Tarzan's hazardous quest for Jane who has been kidnapped by hostile natives. Price £8.95.

CPC users will soon be able to play some of the most popular games from the arcades in their own homes.

Konami plans to start publishing cassette versions of coin-up successes like *Jail Break*, *Nemesis*, *Super Basketball*, *Iron Horse* and *Salamander*.

AN invitation to pull off the crime of the century comes from Aristocrat's latest release *They Slew a Million*.

As a criminal mastermind the user has to select his gang and choose from five targets ranging in difficulty from a jeweller's shop to a bank bullion raid.

The game features arcade style sequences for each robbery and costs £8.95 on cassette, £14.95 on disc.



Multiface 2 Interface

Relational database

A NEW relational database for the CPC8128 and PCW range has been released by Advance Software.

The Database Manager allows more than one file to be opened at any time and information to be related between the files.

Form layouts are user-definable and not restricted to screensize. A built-in word processor allows explanatory text and data fields to be positioned anywhere.

Multiple forms can be used for any file, allowing records to be printed out as required. Each data file can have up to five

indexes current at a time, each sorting on three levels using a combination of field elements.

Subject to disc capacity, Database Manager can accommodate up to 10 data files each with 32,000 records of a maximum 2,000 characters. Individual field elements can contain up to 75 characters. Price £29.95.

Also from Advance Software for small business users of the PCW and CPC is Money Manager, a disc-based financial planning system allowing for up to 100 transactions a month. Price £29.95.

Midi link-up

A MIDI interface from GHCP Electronics allows musical instruments and other equipment to communicate via Aristocrat CPC editors.

It plugs into the expansion port of the computer and includes a through connector to allow use of other peripherals.

Software is available for Casio CD synthesizers.

The multi-editor is a menu-driven package offering a full-screen voice monitor, voice editor and multi-option voice library editor.

Voice editor allows waveforms to be drawn on screen using cursor keys, or to be defined digitally using a

single-key method to build or modify the waveforms.

Using the library editor voice data can be stored on disc or tape either singly or in banks of 16 voices, and subsequently loaded back to the synthesizer for performance or further editing.

There are 32 voices supplied free with the multi-editor software. The cassette version has a modified library editor to suit CPC484 tape-only operation.

The MIDI interface costs £90, multi-editor £25 on disc and £15 on cassette.

Preprogrammed banks of 32 voices each are available for £15 on disc or cassette.

New CPC interface

A MULTI-purpose interface from Romantic Robot is now available for the CPC range.

Multiface 2, a menu-driven back-up system, has 8k internal ram and rom and requires no additional software.

Programs can be stopped and fully restored at any point, and its multi toolkit can study and modify both hardware and software.

Romantic claims that with the automatic, compressed saving facility standard 94k programs can be loaded in under 20 seconds from disc and six minutes from tape.

Other features include 10 one-touch commands and a through extension bus for connecting other peripherals. Price £40.95.

DIY maths course

A VERSION of educational software house ICL's most popular title *Micro Maths* has been released for the PCW range.

The self-tuition course of 24 programs covers 93 topics and takes beginners from simple averages through to calculus and matrices.

It covers algebra, geometry, trigonometry, statistics and arithmetic, and includes topics common to the examining boards at O-Level and GCSE. Price £24.

BOOKS KEPT INTACT

DISTRIBUTOR Lord & Flynn and Cavalier Software are joining forces to produce and market *Intact*, an accounts package for the PCW.

It will either stand alone or integrate with *Intactek*, Cavalier's stock control and order processing package.

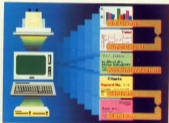
Intact should be available before Christmas and is expected to be priced under £50.

Continued on page 102

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Arcadian's Revenge



Zarba

CPM	<input checked="" type="checkbox"/>
PCW	<input type="checkbox"/>

TO ORDER, PLEASE USE THE FORM ON PAGE 75

Program: Impossible Mission
Price: £8.99 (suggested)
£14.99 (real)
Distributor: U.S. Gold, Unit 2 &
 3, Markon Way, Watford,
 Buckinghamshire HP8 7AZ, Tel:
 017 524 3388.

PROFESSION: Elvin, Agent-killer, well known computer genius and psychopath, has faded into the military computers of the major nations. Within six hours he will have cracked the launch codes and started World War Three. This is how long you are allocated to penetrate his underground stronghold and find the control centre.

The professor's stronghold consists of 32 rooms which

Dangerous mission

are interconnected by numerous lift shafts and you begin the game in one of the lifts. Lefts to your left and right can be explored or you can pull back on the joystick and the lift will descend to the next level.

Your footsteps have a wonderful metallic ring to them as you leave the lift and run along the corridors. Running off the screen causes the adjoining room to be displayed. This is made up of a series of corridors, some of which can be accessed using mini lifts. All of the rooms are patrolled by the professor's robots which are sensitive to

movement and armed with high voltage electric rods.

To enter the professor's control room you must have a nine digit password. By completing a series of sub-puzzles you will be given each digit in sequence. Puzzle sections are hidden in the furniture to be found in each of the rooms, and so are passages which can be entered into one of the professor's security terminals. These will immobilise the robots or reset the lifts to their original positions.

As secret agents you are poorly equipped - one pocket computer to help you solve the



puzzles, and your own athletic prowess.

Impossible Mission is a very good conversion from the Commodore original.

James Riddell

Sound	F
Graphics	B
Playability	B
Value for money	B
Overall	B

Program: Dan Dare Pilot of the Future
Price: £3.99 (suggested)
£14.99 (real)
Distributor: Virgin Games, 2-4
 Venice Way, Marlowe Road,
 Oxford OX1 2EN, Tel: 01-277
 8070

WHEN I was a lad Dan Dare fought weekly battles against the evil robots on the front cover of the Eagle comic. Now, courtesy of Virgin Games, Dan Dare "Pilot of the future" enters the computer age with a bang.

The Mission, Dan's arch-enemy, has launched a hot-

Dan back in style

tracked-out asteroid in the direction of Earth and unless we comply with his demands the planet is doomed. We have only one chance of survival - Dan Dare and his faithful companion Digby.

Dan and Digby have flown to the asteroid in an attempt to explode it before it reaches Earth. As they landed they were ambushed and Digby was captured and imprisoned at the far side of a large chasm. Dan must search the asteroid for the four bridging units

required to span the gap.

As he locates each of them he is allowed deeper into the asteroid to face ever increasing dangers.

The graphics in the game make those of Xenon look amateurish. The interior of the asteroid is supported by a complex combination of columns and girders. Every feature is drawn complete with shadow and highlights. The cartoon characters which represent Dan and the various types of Teen like Mekan's



followers are truly incredible.

Dan Dare is a truly excellent game that I can thoroughly recommend.

James Riddell

Sound	B
Graphics	FD
Playability	FD
Value for money	FD
Overall	FD

Program: Split Personalities
Price: £8.95 (suggested)
£14.95 (real)
Distributor: Gamart, 204 Wipple
 Road, London E20 3BQ,
 Tel: 01-447 8824

MANY of the world's most famous celebrities have gone to pieces and you must put them back together again.

A remarkable likeness of a famous person has been split into 20 separate pieces which have then been thoroughly mixed up. The area on which you must reconstruct the image is a 5 x 5 grid.

To the right of the playing area is a small picture of the completed puzzle. Whenever the cursor moves over a piece

on the playing area a section of this small picture will be illuminated indicating its correct position on the grid.

When the game begins the playing area is empty and pieces can be brought on to the grid by moving the cursor to the top left-hand corner and pressing the fire button. Once on the grid the pieces are moved around by placing the cursor on the selected piece, pressing fire, and moving the stick in the desired direction.

Important features of the playing area are the three sliding sections of wall. These

open and close at random and can be used to dispose of unwanted pieces.

Apart from the sections which construct the character's face there are also bonus pieces. These are related images such as the Soviet and US flags which, when thrown together, will earn you bonus points.

Occasionally a bomb will appear and if you fail to push it through a gap in the wall within five seconds you will lose a life. You are allowed three lives to complete the puzzle, and you will need all of



them.

Split Personalities is a combination of excellent graphics and infuriating puzzles. If you are a puzzle nut then you won't find a better game.

Steve Brook

Sound	B
Graphics	B
Playability	B
Value for money	B
Overall	B

Program: Icon Joe
Price: £8.95 (suggested)
Supplier: Microsoft, Maxwell House, 74 Woodley Street, London EC2A 3DF, Tel: 01-777 4900

FOR many years I was under the misguided impression that at the heart of a computer lay a soulless mass of solid state electronics. I was wrong. Each component, variable and loop has thoughts and feelings. This is a story of one such icon by the name of Joe.

"Shut down in 30 minutes" was the message which went round the computer. Icon Joe's love of life had grown too strong - he didn't want to

Icon's adventure

be reset. So with only 30 minutes remaining you must guide Joe through the computer's internals in a desperate attempt to find a new host computer.

Icon Joe is an arcade adventure game with the emphasis on the adventure aspect. The screen display is divided into several windows, the topmost displaying a four colour picture of Joe and his surroundings.

The next window shows the time remaining and the items which Joe is carrying

while the bottom window informs you of the score which you have just earned along with any incidental comments.

Finally, to the right of the screen there is a block of 10 icons which allow you to interact with Joe. The status icon tells you the percentage of the adventure you have completed while the chat icon allows you to talk to passing components and persuade them to help you. The action and manipulate icons allow you to collect, examine and use the various objects which



you will encounter.

Well programmed with a multitude of useful options, Icon Joe is a simple to operate yet very taxing adventure game.

Jon Davis

Sound	..... 8
Graphics	..... 8
Playability	..... 9
Value for money	..... 8
Overall	..... 8

Program: L'Affaire Vers Cour
Price: £9.95 (suggested)
 £14.95 (real)

Supplier: Infogames, 65 Ave Montre, 8889 Road, Montreal, Quebec H3T 2S6, Tel: 01-333 0123

A BEAUTIFUL brunette lies sprawled on the apartment floor. The pool of blood surrounding her suggests that she is no longer alive. The evidence points to suicide, but your instincts tell you that something is not quite right.

The investigation takes place in two separate stages. Having loaded part one of the game you are presented with a highly detailed drawing of the

Be a detective

scene of the crime. As you cannot touch anything until the forensic people have done their bit you limit yourself to taking photographs of the scene.

A small red square representing the viewpoint of your camera can be moved around the screen. By clicking it on an object such as a matchbox and pressing the copy key a blown up photo is displayed. You are advised to examine everything in the apartment in minute detail and make notes on all you find. Once you are satisfied that you have not

missed a clue then you can load the next part of the program.

You are now sitting at your desk in St Etienne. Using your typewriter you list the objects which you found at the scene of the crime.

As the French police force is a very high tech organisation your investigations are performed from the comfort of your desktop terminal. Via the computer network you are able to contact other police services, justice departments, prison administrations, and the national police.



L'Affaire Vers Cour is not a game but a real life criminal investigation. It is worth every penny and is highly recommended.

Carol Barrow

Sound	..... 8
Graphics	..... 9
Playability	..... 9
Value for money	..... 8
Overall	..... 8

Program: Virgin Atlantic Challenge Game
Price: £9.95 (suggested)
Supplier: Virgin Games, 2-4 Cannon Yard, Finsbury Road, London EC1A 3DX, Tel: 09-757 8033

In the summer of 1986 Richard Branson and his crew broke the record for crossing the Atlantic Ocean in a boat. This program released by Virgin is a fun simulation of that event.

Richard Branson's crew have abandoned fire on Challenger 2, which is divided into three main areas, the cockpit, the computer room, and the living and engine room.

Atlantic antics

To complete the game successfully you must divide your attention equally among avoiding icebergs, feeding Richard, refuelling the fuel tanks and running the Virgin empire.

Any spare time is best spent eating, which is achieved by standing in the galley and pressing the fire button. A colour meter will begin to rise as you eat. If you leave Mr Branson too long without food he will turn a fatty shade of green and slow down a great deal.

An information line at the

bottom of the screen constantly flashes warnings of obstacles in the water and incoming icebergs.

One blatant omission is that the offending obstacles cannot be seen from the cockpit. One minute the view is perfectly clear, the next you're playing Daway Jones a visit.

Telexes are answered by running to the onboard computer. You are presented with a business proposition which requires a yes or no answer, your aim being to make money.

The Virgin Atlantic Chal-



lenger Game should keep you entertained for an hour or so. The graphics are quite pretty but that's about as much as I can say in its favour.

Steve Brook

Sound	..... 5
Graphics	..... 7
Playability	..... 5
Value for money	..... 5
Overall	..... 5

Program: StarStrike II
Price: £8.99 (casualist)
 £14.99 (hard)
Supplier: Alamo, Wellington
 House, Upper St Martin's
 Lane, London WC2N 9DL
 Tel: 01-276 0758

USING the Mark I StarStrike fighters the Federation drove the outsiders into deep space. With the development of the infinitely more powerful Mark 2 StarStrike ships they intend to neutralise the Outsider's force planets.

The Outsider's system is based around five stars and their associated 23 planets. The planets fall into three categories - military, industrial and agricultural. Each has its

Galactic battles

own key point which must be knocked out in order to neutralise the planet.

The game begins with your ship on board a Federation support module. From here you select which of the five star systems you wish to visit and after a short hyperspace jump you arrive at your destination.

All planets have several defence shields surrounding them but every shield contains a small opening to allow the entry of the Galactic's own ships.

An alternative route is to

destroy the wheel shaped space station which orbits many of the planets. To do this you must shoot the five pods which ring the station, complete a tricky docking manoeuvre and then emerge from the rear exit of the station's hangar after immobilising its controls.

Once through these outer defences you encounter the planet's orbital fighters, very impressive looking in realistic 3D.

Having eliminated the fighters you go down to the planet's surface and shoot up



the ground defences.

The gameplay is nicely varied and the graphics very good but it is such a pity that the ship handles as though it is flying through porridge.

James Mitchell

Sound	5
Graphics	5
Playability	7
Value for money	5
Overall	5

Program: Trivial Pursuit
Price: £14.99 (casualist)
 £19.99 (hard)
Supplier: Domark, 204 Bishop
 Road, London SW20 9PP
 Tel: 01-847 5004

If you are part of the "in crowd" then you will have spent many an evening applying your brains playing Trivial Pursuit, rather than getting slobbily down at the Dog and Duck. Now a computerised version has been released by Domark.

After loading, you are requested to enter the names of both men and women players. A comprehensive options menu allows you to

No trivial queries

alter several of the games features. A timer can be used to limit the time taken by a player to answer a question, and you have the option of using a cheat called TP as question master.

When the game commences a very impressive board is displayed. Instead of rolling a die TP throws a dart at the numbers one to six and all possible moves are then highlighted on the board. You move your token to your chosen square and one of the six subject categories will be illuminated.

The scene now changes to TP's study where it's time to put your thinking cap on. Questions can be of three types: A straight forward written question as in the board game, a picture question for which a projection screen is lowered to display an image, or a musical question for which TP turns on his cassette player to play a tune. Answers are not typed into the computer but spoken out loud, and you press the fire button or speaker to reveal the correct answer. You are then required to enter whether or not you got



it right.

Trivial Pursuit is a computer program of the highest calibre. Though I doubt that it will ever replace the real thing.

Carol Barnow

Sound	5
Graphics	5
Playability	5
Value for money	7
Overall	5

Program: Frost Byte
Price: £8.99 (casualist)
 £13.99 (hard)
Supplier: Alamo, Wellington
 House, Upper St Martin's
 Lane, London WC2N 9DL
 Tel: 01-276 0758

DEEP beneath the frozen surface of the planet Casmia, helpless Kreslers are being captured and eaten by the ice monsters. One little Kresler called Hickey has escaped from his cage to make a bid for the surface and freedom.

This wacky-ended caterpillar, which moves around like a winky spring, can move left, right and jump. He can also pick up a variety of objects

which he will find in the caverns. Just inside Hickey's cage there are two bullets which provide him with an initial supply of ammunition.

Other essential items are the diamonds which are to be found in the caverns. These come in three different varieties and will enable Hickey with special powers - red ones boost his speed, blue ones increase the height to which he can jump and the green ones allow him to fall further without fatal results.

Each screen is populated by numerous ice monsters who

make life as difficult as possible for a temporary Kresler. Some must be shot, but others are impervious to bullets and must be tackled with cunning and split second timing.

Although Hickey only appears to jump straight up and down don't be fooled into thinking that these are his only movements, they're not as you will discover for yourself.

The graphics used in the game, although very colourful, do give the odd flicker now and then. Also the text used on both the title and final score



screens is almost legible.

With a little nipping up Frost Byte would make quite an attractive addition to anyone's software collection.

Jon Davis

Sound	7
Graphics	7
Playability	5
Value for money	7
Overall	7

Program: *Thrust*
Price: £7.99
Supplier: Activision Software,
 Wellington House, Osney
 St, Martin Lane, London
 WC2H 9DL. Tel: 01-278
 8782

The Rebels intend to launch an attack against the Empire and to this end have captured several starships, but without drive units. Donning your Luke Skywalker gear you must steal two units from the Empire's storage plants.

Your space craft, buildings and gun emplacements are displayed as high resolution line drawings.

The game is played as a

Skill rewarded

series of missions of increasing complexity. In the first the drive unit is situated on the planet's surface, along with a fuel dump, gun emplacement and nuclear reactor. In subsequent missions the drive will be located in underground caverns.

Fuel can be taken on board by hovering over the dump and activating the tractor beam. To achieve the delicate hovering manoeuvre you need to point the ship away from the planet and use short bursts on the thruster to counteract the effects of gravity.

Having located the drive unit the tractor beam can be used to tow it behind your ship and this is where the fun really begins. The drive unit hangs beneath the ship like a pendulum, attached to the ship by a solid bar.

Each movement of your craft will cause a realistic movement of the pendulum. As a pilot you must fly as smoothly as possible, counteracting every swing of the drive unit. Should the swing become uncontrollable you will be dragged into a cavern wall.



Thrust has got what it takes to become a classic computer game - inherent simplicity combined with handsome rewards for the skillful player.

Jan Havis

Sound	3
Graphics	3
Playability	10
Value for money	10
Overall	10

Program: *Mutant Elevator*
Price: £9.99 (suggested)
 £7.95 (flat)
Supplier: Empire of Illusions
 House, Colney Park, Water-
 loo, Hertfordshire. Tel:
 02283 73888

FBI headquarters has been taken over by enemy agents, if the US government does not agree to their demands then a bomb will be detonated, destroying the building and killing everyone inside. Agent Trevor (that's you) must penetrate the building and make his way to the 82nd floor to defuse the bomb.

The building is divided into units of eight floors accessed

Sticky search

by a series of lifts. The floors are separated by locked emergency exits, and the porter who holds the key has gone into hiding.

You must therefore search the building room by room to find him while avoiding the enemy agents.

The floors can be made safe by entering a sixteen part code. Two sections of this code are to be found in each block of the building, hidden under items of furniture or behind paintings.

Every floor of the building is crawling with badies, which

you can dispose of using a well timed flying kick or, more usually, a slug from your 45.

The graphics employed in this game are brightly coloured but a little cluttery. The bad guys are drawn as shady characters in grey overcoats and hats while you are a rather pathetic rock man. This is disappointing as great care has obviously been taken to design the other characters and objects.

The game is a complex arcade adventure with many items to examine and an infinite number of spies to



shoot. It may not get to number one in the charts but it will certainly keep you occupied for many a frustrating hour.

Steve Brook

Sound	7
Graphics	4
Playability	8
Value for money	8
Overall	8

Program: *Return to Oz*
Price: £9.99 (suggested)
 £7.99 (flat)
Supplier: LSI Data (UK) Ltd 2 & 3,
 Hafford Way, Hafford, Birm-
 ington B9 5AA. Tel: 027
 281 2388

LONG after the excitement of your first adventures in Oz has died away you find yourself dreaming of Oz once more. Your friends, the tin man, scarecrow, and cowardly lion are in trouble and somehow you must find your way back to Oz to help them.

Return to Oz is an adventure game of some for children. In a normal adventure half the fun of the game is spending many hours trying out different

Glamour is gone

commands and possibilities until you stumble across one which works. But you are deprived of this pleasure in Return to Oz as the whole game is menu driven.

The screen is divided into three windows. The top one describes the location and provides replies to your queries and the large middle window displays a picture of your surroundings complete with all people and objects. The final window is a single line at the bottom of the screen showing the menu options available.

The Look command draws a box around the first object on the screen. You press the spacebar to move the box to the object or person you wish to look at then press Return and read the response in the top window.

If there are no objects which can be looked at then the look command will have no effect. Other commands include Talk, Search, Get, Use, and Leave. These too use the box principle, unfortunately the game soon degenerates into a pattern of using every command on every object on



the screen. This is the first adventure game for children that I have seen on the Amstrad, and I'm afraid to say that it is disappointing and youngsters will quickly lose interest.

Carol Sampson

Sound	0
Graphics	6
Playability	6
Value for money	6
Overall	6

Chart Busters

Four action-packed classics to challenge the most expert gamer

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PLANET RESCUE
New Earth has been invaded. Can you rescue the survivors?



LEAPER
Escape the rush-hour chaos... then brave the raging storm

1	1	100	100	100
2	1	100	100	100
3	1	100	100	100
4	1	100	100	100
5	1	100	100	100
6	1	100	100	100
7	1	100	100	100
8	1	100	100	100
9	1	100	100	100
10	1	100	100	100
11	1	100	100	100
12	1	100	100	100
13	1	100	100	100
14	1	100	100	100
15	1	100	100	100
16	1	100	100	100
17	1	100	100	100
18	1	100	100	100
19	1	100	100	100
20	1	100	100	100



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We interrupt this program... to take a Break

By
PETE BIBBY

LAST month we took a look at the **ON...GOTO** and **ON...GOSUB** instructions, two very useful bits of Basic for making choices. And having said how useful they are I'll remind you of their use with one of the most trivial programs I've ever written. (And I've written lots as I've tried to demonstrate various obscure Basic keywords.)

You shouldn't have too many difficulties in seeing how Program 1 works, though why anyone should do it might be your brain. After the introductory **REM**, it goes on to the subroutine call at line 20.

This invokes the subroutine defined between lines 150 and 190 which asks you to pick a number between 1 and 3. This routine just begs to be misinterpreted, an exercise I'll leave to you — as authors say when they can't see how to do it themselves.

Once a number has been picked and stored in the aptly named numeric variable **number**, the pro-

gram moves on to the **ON...GOTO** of line 30. (Depending on the value of **number** the program now leaps to line 40, 50 or 60.)

However, in this case it doesn't make much difference as all of these lines consist of a jump to line 70. (Well I did say that the program was trivial, didn't I?)

Just like all roads lead to Rome, so all the choices from line 20 lead eventually to line 70. And line 70 calls the subroutine again to give you yet another choice.

On return from the subroutine **number** has a fresh value and the program now goes to the **ON...GOSUB** of line 80. A quick glance at the line numbers after the **GOSUB** should show you that whatever the value of **number**, our faithful subroutine at line 100 is called yet again. And as soon as **number** is given another value and control is returned to the main program, the micro runs into the **ON...GOTO** of line 90.

Now whatever the choice, the program goes back to line 30 and the whole process starts again. Incidentally, can you explain why no **END** is needed to separate the subroutine from the main body of the program?

And if you've followed all that, then **ON...GOTO** and **ON...GOSUB** should hold no fears for you. One thing that you may have noticed if you've run the program (and you should, this is a "hands-on" course) is that the program never finishes.

It would go on for ever if you didn't do something about it. The more uncouth amongst us might switch the computer off but sweet natured individuals like you and I will just press the Escape key. When the Amstrad finds this instead of the

expected value for **number**, the program halts with a "Break" message. Program 1 is rather harder to stop.

```
10 REM Program 1
20 WHILE NOT free
30 PRINT "This is an endless loop"
40 NEXT
```

Program 1

Taken at its simplest the program consists of a **REM** and the **WHILE...WEND** loop of lines 20 and 40 with the **PRINT** of line 30 sandwiched between them. Yet from these four lines (in reality, three, as the **REM** does nothing) the screen fills with output, telling you that

This is an endless loop

Just in case it hadn't occurred to you!

If you want to know why the loop is endless, take a look at the condition attached to the **WHILE** of line 20. The condition is the enigmatic

NOT free

Now **free** is a variable name and, as it hasn't been given a value elsewhere in the program, the Amstrad assumes it to be zero. So

NOT free

boils down to

NOT 0

and as the Amstrad takes 0 to mean false and **NOT** false must be true — if it's not false it must be true — the condition for the **WHILE** is always true. And this remains the state of play, as nothing occurs to change the value of **free** and hence the loop conditions.

Anyway, whatever the logic

```
10 REM Program 1
20 ON number GOTO 40,50,60
40 GOTO 70
50 GOTO 70
60 GOTO 70
70 GOSUB 100
80 ON number GOSUB 100,100,100
90 ON number GOTO 30,30,30
100 REM Choice routine
110 PRINT "Pick 1,2,3"
120 INPUT number
130 RETURN
```

Program 1

behind the endless loop, we're stuck with it and have to resort to the Escape key.

Pressing it once halts the output. The program is now in a state of suspended animation. What happens next depends on which key we press. If we press Escape again, the program terminates with the message:

```
break in 50
ready
```

However, if we press one of the character keys, say A, then the program carries on from where it left off.

It used to be said that endless loops were something that good programmers avoided. After all, who'd want an expensive mainframe computer to be tied up with some kid's endless loops? With the advent of the micro, however, things are different and endless loops are now OK for things like displays and games.

But sometimes we want to be able to interrupt the endless loop for a while and get the micro to do something else and then return to the loop.

For instance we might want to break off from playing one of Roland Welbylove's superb games and check the high score table or the rules.

The trouble is that if we press Escape once the program enters a state of limbo and the micro does nothing until we press a key and it carries on with what it was doing before.

If we press Escape twice the brute gets to a halt. Either way we've interrupted the endless loop but we haven't got anything to show for it. Program III uses a new Basic construct, ON BREAK GOSUB, to interrupt endless loops. Be warned! Save this program before you run it.

What the ON BREAK GOSUB command does is to lurk in the background of the program waiting until you interrupt it by pressing Escape twice. Now, instead of the program halting, the micro goes off to the subroutine specified after the GOSUB and executes that.

In polite circles this is known as servicing or handling the interrupt. As soon as the interrupt handling routine has finished, the program carries on as before. It's been interrupted but not stopped. Let's look at Program III

```
10 REM Program III
20 ON BREAK GOSUB 40
30 WHILE NOT true
40 PRINT "This is an endless loop"
50 WEND
60 REM interrupt subroutine
70 PRINT
80 PRINT "The loop is interrupted"
90 PRINT "but not stopped"
100 PRINT
110 FOR delay% TO 1000
120 NEXT delay
130 RETURN
```

Program III

in more detail.

The ON BREAK GOSUB comes right at the beginning of the program. This sets up or "enables" the interrupt handling. From now on, any double pressing of Escape will result in a leap to the subroutine at line 60.

Lines 30 to 50 form the endless loop familiar from Program II and once you run the program the screen will fill with messages telling that the loop is endless.

Now, however, if you press Escape twice, the program doesn't halt as the ON BREAK GOSUB has told the micro that if this happens it isn't to stop but to "visit the subroutine" at line 60.

The subroutine itself is fairly straightforward, it just tells you that the loop is interrupted but not stopped and then enters a FOR ... NEXT delay loop to slow things down so you have time to see the message.

In this case the subroutine is fairly trivial but as I said earlier, the ability to get the micro to do something rather than just grind to a halt can be useful.

The trouble is, what happens when we do want the program to stop? As you'll have found if you've run Program II you have to switch off or use the Escape + Shift + Control combination. Either way we lose the program, hence my earlier advice to save it before you run it.

Now this problem has arisen because our ON BREAK GOSUB has "trapped" the break condition which occurs when Escape is pressed twice. Normally the program halts but now we've arranged or enabled things so that a subroutine is called and when that is done the program carries on.

This is useful but it would be nice if

we could switch this off or disable the interrupt handling routine, as it's known. Program IV shows how this can be done.

At first sight this is very similar to Program II, with line 20 establishing the Break handling routine and an endless loop printing a message. However line 30 is certainly different, initializing the variable count with a value of zero.

This is then used in the interrupt subroutine that begins at line 70. Again the subroutine is extremely familiar, being mostly a straight lift from Program II. The difference lies in lines 140 and 150.

Line 140 sets count as a counter to keep track of the number of times the interrupt subroutine has been called. Each time it is incremented by 1. The IF of the next line checks the value of count. Only if count is 5 is the rest of that line processed. And that part consists of the new command ON BREAK STOP.

In effect, it nullifies the effect of ON BREAK GOSUB. When this happens, the previous break trapping is switched off and next time Escape is pressed twice, the program halts with the message:

```
break in 10
ready
```

So there's no need to lose the program in order to get it to stop.

And that's where I'll interrupt the flow this time and leave you to learn to handle ON BREAK GOSUB and ON BREAK STOP in your own programs while I take a break. More on interrupts next month.

```
10 REM Program IV
20 ON BREAK GOSUB 70
30 count=0
40 WHILE NOT true
50 PRINT "This is an endless loop"
60 WEND
70 REM interrupt subroutine
80 PRINT
90 PRINT "The loop is interrupted"
100 PRINT "but not stopped"
110 PRINT
120 FOR delay% TO 1000
130 NEXT delay
140 count=count+1
150 IF count=5 THEN ON BREAK STOP
160 RETURN
```

Program IV

Adventuring with Gandalf

Jewel of a trilogy

An exciting new development for Amstrad owners has been the release of Rainbird's *Jewels of Darkness* trilogy, a compilation of three of the best adventures ever written for little more than the price of one.

Both the CPC and PCW versions of the games have been incorporated on to one side of the disc. In fact the same files are used by both and only the addition of two small COM files has been necessary. Unfortunately, the PCW version won't run under CP/M as the 8128, which would have been very nice.

However, if this practice catches on we could well see a vast range of adventure software becoming available for the PCW.

I do have some doubts about Rainbird's inclusion of the Lendak protection system. I can't really see PCW users accepting it as most PCW software is unprotected and encourages purchasers to make back-up copies. What do you think?

REVIEW

In a hole in the ground there lived a Boggit. It was not a particularly nice hole, nor indeed a particularly warm hole, but a hole it was nonetheless, and to the Boggit it was home.

The hole was in the Shire, a particularly remote part of Western Middle Earth in this, the Third Age, (or thereabouts). The Boggit was called Nimbo Peggins and he was a lairy, fat Boggit whose only purpose in life was to blow rings and watch the pretty elven girls go swimming down at the old mill pond.

Being contented with his lot, he vowed never to become part of three adventures that seemed to be growing more and more fashionable. Thus when he began to notice fast comers—a black swine, a six-headed rabbit and Gandalf the meddling old conjurer crawling from bush to bush

up his garden lawn, he decided to bolt the door and spend the day inside. But fate cannot so easily be cheated.

From the above description, any adventurer will be able to recognise that the hands of Fergus McNeill and Judith Child have been at work again.

The Boggit is a three-part graphical adventure from ORL, written using the Quill and Illustator. It's the precursor for *Bored of the Rings*.

You begin the game in a familiar room with a green door. Any attempt to open the door will fail. It has a combination lock on it and you would appear to have lost the number.

You'll find that only this and one other location, the toilet, are open to you at the moment. The toilet seems to have very little to command it, though like me, you will doubtless spend a lot of time in there. Any attempt to actually use it will get you taken to an uncomfortable place and a date for later on in the game.

Exploring the main room doesn't seem to get you very far either and Gandalf makes a flying visit with some exploding chocolates. After you have managed to avoid getting blown up you might consider the chest in the corner. Yes you can open it, but how do you do anything else with it?

I will help you here; it took me two days to come up with an answer and then I only fessed it by pure chance. UP CHEST will get you in and find you with the answer to getting out again, of the door that is. As to getting out of the chest, try to think of it as a mountain or tree.

Having finally succeeded in getting off on your travels you will find you can only visit one more location! Gandalf, Thomy and a group of disappasable dwarves jump on you and beat you up. When you come to, you find that Gandalf has delusions of being a game show host and wants to know how much one-fifteenth of Thomy's treasure is worth. Paul Daniels has the answer to this one.



Granddall and the rest of the dwarves are so pleased you have got the answer right that they insist on holding a party. Needless to say, they want the pleasure of your company and the next morning you come too, with somewhat of a hangover.

Now you think, time to go exploring. Well, yes and no. First you get waylaid by a kertside philosopher and then you bump into some trolls. You have one move to make before they eat you, so it had better be good. Mine wasn't and still isn't.

The whole adventure is a complete send up of Tolkien and works admirably. While it is not the most complex adventure I have seen it is certainly the funniest.

Overall, brilliant. I was in stitches every time I played it. You must get this one. Highly recommended.

Presentation	7
Atmosphere	50
Presentation Factor	50
Value for Money	50
Overall	8

HALL OF FAME

The Hobbit (cont'd) — G. V. White

Now get out! Go to Beorn's house again and wear the ring to Thorin's canoe and then follow you. Go to the west bank and save the game again.

Look across the river and you will see a boat. Throw the rope across and repeat this until it lands on the boat and then pull the rope. Climb in to the boat and sail across the river.

Keep trying to break the wall in the green forest until you succeed.

Do the same at the place of the black spiders and then save the game again.

Wear the ring in the elvish clearing and then EXAMINE MAGIC DOOR. Wait until the door opens and then go NE to enter the elvish halls. Note: You must keep WEARING RING as it slips from your finger every 4-5 moves.

Go to the cellar. There are several ways to escape from here:

a) On a barrel, keep WAITING until

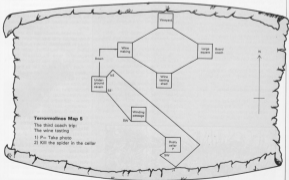
the butler throws one through the trapdoor and then jump onto it, or take a barrel and throw it through the (open) trapdoor and then jump on to it. b) In a barrel: open the barrel (or wait until one appears if there are none there). Drink the wine if it is full (think hush sheme shuplashing restulstul). Climb into the barrel and wait until the butler comes along and throws the barrel out.

All these methods take you to forest river (west) and then long lake. (Note: Keep WEARING the ring!)

Now save the game again.

Subtask (cont'd) — Joannee and Annabel Thom

Go to the siltbay and pick the lock. Then drop the clip and take the bottle. Go down from the second dock passage to the battery switchboard and tip the bottle on the mat. Take the pill.



From Page 23

dissolve it in the beaker of water and drink the medicine.

Go south and take the battery. Return to the junior rater quarters and drop the bottle and take the vacuum. Go to checkpoint charlie and insert the battery in the vacuum. Then press the switch and vacuum up the dust. Press the switch again and dismantle the vacuum. Then take the cloth and battery. Go to the main generator compartment and drop the beaker and take the knife.

Fountain Diamond (over) - G.V. White

Once you have unlocked the trapdoor and get into the cellar, open the chest and examine it. Drink the wine, get the glass and then rub the glass to break the window. It is usually around this point that the guardian appears - kill him, if you can't then you are either dead, hurt or not strong enough - in either of the latter two cases, eat something. If you don't kill him you will be taken to the cells. If you can free Boris before he appears, get the gun from Boris and shoot the guardian. But beware - you only have one bullet and you will also need to kill the woodcutter later.

Now save the game again.

A conductor or a violinist may appear around about now and you should not kill them. Do NOT open the green curtain, yet!

Tell Boris to pull the lever at the secret door. Get the statue from the secret room.

Go to the trapdoor in the short corridor and keep hitting it until it breaks.

Dangerous Adventure - G.V. White

Go into the packing case and then in again. Take the chandelier, go east and press the button. This is your resurrection device and

storeroom. Go out and then take the case. From now on, whenever your hands are full you can go back inside the case and leave things there thus allowing you to carry more. Take the driftwood.

Take the poppy pod. Now go to the island and wave the pod when you reach the stepping stones. Go north and take the mirror but do not visit the killer willow yet.

Go to the clearing and climb the tree and get the berry. Now drop it! Go down and get and wear the belt, this makes you stronger. Get the berry again.

Go east on the road through the forest. The mirror will reflect the sleep spell. Wake the thief and take the wand, dice and coins.

Go to the small mound below the nest and wave the pod then go up and get the jade egg.

Now go to the willow and throw six objects at it. Any objects will do except the belt. Take the axe and attack the tree. Resped favourably to the dried's plea and you will get a carving as well as the objects back that you threw at the tree.

Go to the hill top and wait until the Racketsness appear. Agree to gamble with them.

Go to the cave mouth before the sun sets because once it does you will die.

Light the driftwood from the ferns. Ignore the treasure vault to the east.

Wear the helmet and take the crucifix, you'll need both later.

Take the octopus and visit the second dark deed and room. Wear the yellow collar and and take the staff.

Search the corpses and then take the bow and the corpse. Leave the orange collar, yellow is lighter. Note the line room north of the cylinder room. Save before you enter here as you may take a tumble!

PROBLEMS

Nick Pegg is in need of help in **Message from Andromeda**. He wants to know if there is a way past the rockfall and whether there is an exit from the limestone caverns. Not having a copy of the game to hand I can only assume that you mean the maze of underground passages and the rockface at the east end of the long cavern. If so, the route through the maze is: E.E.E.M.E. though this won't allow you to explore two useful locations. Use the explosives from the lower store room and the detonator from the control room.

Nick Pegg and Liz Ridley would like to know where to find Tansen in **Murder in Glaston**. He is in the chimp's clearing.

Nell James is having problems with **Bored of the Rings**. He wants to know what to do with Haslbary, how to get the barrow-wright's clue, how to get past the Moorea Gate, how to kill creatures without getting killed yourself and what to do with the wolves, spy-crows and snow drift. What snow drift? Ignore Haslbary, the wolves and the spy-crows. Don't try to kill anyone. **ASK CLUE** and use the answer to get past the gate.

S.Lawson would like to know how to get the amulet from the devil in **Warlord**. When you have killed the ox in Hillfort, unroll the rope and take it. Capture the Roman and give him to the devil.

Carl Peters would like to know where to find the second time lock key in **Game of Stones**. Get past the little nasties using the staff, go forward and get the key. In the next room you must get and read the paper - it has the second time lock number on it.

Maria Brooks has written in to say that if you want to save your position on disc in **Lords of Midnight** you must use a system formatted disc and not a data formatted disc.

S.Lawson has a question about **Sorcery**. How do you get through the locked bottom right hand door that appears as you enter level 3 after having received all the sorceries? Can anyone help?



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We started our tour of CPM's disc function calls last month by looking at how to open, read, write and close simple sequential files. Such files, while simple to use, impose the restriction that we can only read or write them from the start, one record after another.

Often we will want to get at a particular record in the middle of the file, or we'll want to add information to the end of an existing file. To do this we must use random record access.

Let's look at reading a file first. As with sequential access, we must use BIOS Function 15 (open file) to tell CPM which file we are going to be reading. I described how this function was used, and what results it returned, last month.

Now, however, instead of using Function 20 (read sequential) to read data starting from the beginning of the file, we will call Function 33 (read random) and extract a record from the middle.

This would obviously be a much more useful method than reading records sequentially if we were writing a database program, for example.

As with write sequential, we pass to the BIOS the address of an FCB in memory. This time, though, we put the record number we want to read into the Random Record field of the FCB (bytes 33 and 34, referred to as r0 and r1 respectively).

This is a 16 bit number, stored in the usual DDD order of least significant byte first (r0) and more significant byte second (r1). Byte 35 (r2) must be

Taking things at random

zeroed, as a non-zero value here indicates an overflow beyond the end of file.

So, for example, if we wished to read record number 67 (R43) from a large file (B-COURFILE.DAT) (counting from the start of the file, with the first record as number 00), we would lay out our Memory FCB as shown in Figure 1.

Function 33 (read random) will then read the record from disc into our specified DMA buffer (or into the default buffer at 800 if we have not specified one previously using Function 26). On return, Register A will contain a code indicating whether the operation was successful; the values this can take and their meaning are listed in Figure 2.

We use Function 34 (write random) in a similar way. Again, we set up a Memory FCB complete with r0, r1 record number in bytes 33 and 34. Calling the function writes the data in our DMA buffer to the specified record position in the file, overwriting exactly the data which was there previously. The Return codes from this function and their meanings are also shown in Figure 2.

If we wish to create a new file, then as before we must use Function 22 (make file) rather than open file. Using random record access, however, we can write data to it in any order, rather than one record after another from the beginning as we had to with sequential access.

So, for example, we could write data to record numbers 2, 48, 23 and 14 only, and in that order. Our file would then have record number 48 (the highest number written) as the last one, and all of the records we didn't put data in will be present but blank.

If we want to add new information to the end of an existing file, we can use Function 35 (compute file size) to help us.

If we supply this function with the address of our MFCB as before, the BIOS will fill in the r0, r1 and r2 bytes for us with the number of records in the file (which is the same as the number of the record immediately following the end of the file, as their numbering starts with 00).

Note that if r2 is returned non-zero, then the file already contains 65,536 records, which is CPM's maximum file size so we cannot add any more to it. This is rather unlikely to occur on an Amstrad, as our 171k discs would have trouble holding a file 9 megabytes in size!

If we now call write random, we can write our data straight into a new record which will be attached to the end of the file. We are now free to add as much data as we want so long as we increase the value of r0, r1 by one each time after we write a record, thus "faking" sequential access.

It is not necessary to call Function 16 (close file) if we have only been writing to existing record positions within a file.

If, however, we have either created a new file or added data on to the end

MFCB:	defb 02	: Drive code - 0 = current default,
		: 1 = A,
		: 2 = B
	defb 'D:\FILE'	: Filename and type in upper case
	defb 'DAT'	: Accl.
	defb 00	: Extent number
	defb 00	: Reserved
	defb 00	: Record count
	defb 00:00:00:00	: Data allocation (blocks=r0 . r1)
	defb 00:00:00:00	
	defb 00:00:00:00	
	defb 00:00:00:00	
	defb 00	: Current record byte
	defb 43:00:00	: Random record number

Figure 1: MFCB for random access of record 67-R43.



Value in A	Random read	Random write
00	Operation successful	
01	Reading unformatted data	(Not returned for write)
02	(Not returned in random mode)	
03	Current close current extent	
04	Seek in unformatted extent	
05	(Not returned for read)	Directory Full
06	Seek past physical end of disc	

Figure 11. Return codes for random read/write functions

of an existing one, we must call close file once we are finished or the information in the file's directory entry will be incomplete.

The above is unfortunately only a very brief examination of random record access. Some of the more subtle aspects, such as combining sequential and random access, are left as exercises for the reader.

Random access is an extremely powerful feature of CP/M but also holds many pitfalls for the unwary. The best way to learn more — as with anything — is to try doing it yourself. Don't give up when your first efforts fail!

A good Z80 debugger such as Rick Surovko's Z80.COM is invaluable for this sort of work. Z80, for example, allows you to open a window on the screen to display the contents of an area of memory while you are tracing the execution of your program. This lets you watch the contents of your PCBs and DMA buffer change as you call the BIOS functions.

There are several such products (including Z80 itself) available in the public domain for a nominal charge through the various user groups — make the most of them.

The last main topic within the BIOS disc functions is that of directory searching.

Obviously, we will often need to know whether a file exists on the disc — for example, if we have been asked to read it or to make sure we don't create a new file with the same name

as an old one by mistake. To do this, we use BIOS Functions 17 and 18 (search for first and search for next, respectively).

If we supply an MFCB containing the name of the file we want to look for, search for first will search the disc directory until it finds a match. It will then return the directory record containing the first entry which matches in our DMA buffer, and a value from 0 to 3 in Register A.

This directory code tells us which of the four directory PCBs in the directory record contains the first extent of the file we are looking for. If CP/M could not find the name we specified in the directory, then the function will return with a value of 255, &FF in Register A.

Once we have found the first extent in the directory which matches our filename we can use search for next repeatedly to search for any other extents the file may have. This function is used in exactly the same way as search for first and returns the directory record containing the next extent and the appropriate directory code in A in the same way.

Both these functions will accept wildcards in the filename, allowing us to use ambiguous filenames. We can use a question mark ? in place of any or all of the letters in the filename in our MFCB; this will force CP/M to ignore those letters when it matches filenames.

Thus, for example, searching for OURFILE???? will return matches

with OURFILE.DAT, OURFILE1.DAT and OURFILE2.BAK if these are on the disc.

If the drive entry in the MFCB (byte 00) is a question mark, then a supersearch is made on the current default drive for matches with files in all user areas. Normally only the current user area on the specified drive is searched.

Associated function calls are Functions 19 and 23, DELETE FILE and RENAME FILE respectively. The first of these, as its name suggests, will make the drive bytes in all the extents of the file we specify in our MFCB into &ES, CP/M's deleted extent marker.

The file will no longer be returned in a directory search and the directory and data space occupied by it on the disc will be reclaimed as unused by the BIOS. This means that when data is next written to disc, or a new extent of a file is opened, the old information is likely to be overwritten.

Therefore, if you ever delete a file by mistake, it is vital that you undelete it by changing the drive &ES bytes in all of its extents back to a valid user number (0..15) before you allow any write operation to take place to that disc. Disc repair/sector edit type programs will allow you to do this. Alternatively, a program such as UNDEBASE.COM will do it for you with rather less safety.

Function 23 (rename file) requires

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us to supply an MFCB which is different to the normal type. The first 16 bytes contain the drive and 16 bytes of an existing file, as usual, but the second 16 bytes must also contain a drive and filename, laid out in exactly the same way as the entry in the first 16 bytes.

The file specified by the first filename, on the drive specified by byte 00, will then be renamed to the second name. Although a drive value must be present in byte 16, it is not used - obviously, the new file is on the same drive as the old one.

One vitally important function is Function 13 (list disc system). This requires no parameters and returns no results. As its name suggests it resets the BIOS to a state in which no drives have been logged in, and sets RW status for all drives.

This means that the first time that we access a disc or drive after a call to Function 13, the BIOS will auto-

matically log it in to allow us to write to it. We must reset the disc system in this way whenever we think a disc may have been changed in one or both of the drives.

If we change discs without telling the BIOS that we have done so then CP/M will alert with the infamous "Bios Err on a: RW" message the first time that we attempt to write data to the new disc.

We can find out which disc drive is currently selected as the default by calling Function 25 (set current drive). This requires no parameters and returns the number of the current default drive in Register A, 0 for Drive A or 1 for Drive B.

Alternatively, we can just look at the byte at address 80004, which is where CP/M stores the default drive number. The default drive is the one used in disc operations where we put a 00 in the drive entry of our PCB (Byte 00) rather than specifying either A or B explicitly.

We can then use the related

Function 14 (SELECT DRIVE) to change the current default from A to B or vice-versa at any time to switch the IO from our routines to either disc.

There are several other assorted BIOS disc functions which are mainly concerned with file attributes and system data. We have, however, looked in detail at all of the more complex functions which you are likely to need in normal programming. Functions such as get addr(DPB) and get addr(ALLOC) are really only of interest to system programmers who need to delve deeper into the workings of CP/M.

■ *Next month, in the last article in this series, I'll be looking in more detail at what our BIOS does and how it works, as well as investigating some of the features which make our Amstrad unique. Then in the New Year I'll be starting another series describing the more powerful CP/M Plus system supplied with CPC6128s and the PCW5255/5512.*

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Well saw last month how your Amstrad organises its screen memory. By screen memory, we meant the bytes of ram that are "reflected" on to the screen. The contents of these bytes determine what appears on the screen.

Memory locations from &C000 to &FFFF are set aside for screen memory, &C000 to &C7FF being devoted to the top line of pixels of each character row, starting at the top-left and working across and down.

Having accounted for the first line of pixels of every character row in this way, we start on the second line, &C800 to &CFFF are devoted to these. So it continues until all eight pixel lines of every character are covered. Figure 1 shows the idea.

I haven't said much about how the contents of a screen byte are related to what you see on the screen, so I'll make up for it this month. The relationship between memory and pixels is complicated by the fact that it varies between modes: You've still got the same amount of screen memory in each mode, it's just that you use it differently.

In Mode 2 you've got fine resolution, but you pay for it by having only two colours. At the other extreme you've got Mode 0, with plenty of colours but coarse graphics. You pay your money - or rather bytes - and you take your choice.

Mode 3 is the easiest. Each bit of screen memory corresponds to a pixel on the screen. We say each bit determines or maps a pixel on the screen.

Let's call this mode's two colours the background and foreground colours. Initially the background is blue and the foreground is yellow, though we can vary this by fiddling

Now let's put theory into practice

with the bits.

Since a pixel can have only one of two values - 0 and 1 - we assign one value to each colour: if the bit is 0 (off) its pixel is coloured in the background colour, whereas if it's 1 (on) the pixel appears in the foreground colour.

Now there are eight bits in a byte, so the contents of &C000 will

read:

As you'll see from Figure 1, 80 bytes are assigned to the top pixel line of the first row of characters. At one character per byte - and this isn't so in the other modes - this gives us 80 characters on the first character row.

Of course our characters need depth as well as width. Again Figure 1 gives us the information we need: while &C000 gives us the first line of pixels in the character, &C800 gives us the second, &D000 the third and so on to &FB00, giving us eight rows of pixels deep.

In all the contents of eight bytes - widely separated in memory - map the top-left character on to the screen. Figure 2 shows what's involved in making this character an A. You should be able to see an A made up of ones in the binary pattern column. Note that the first column is an address in memory, while the second shows the contents of that address.

Enough of theory! Let's put it into practice with Program 1. This prints a right-angled triangle character on to the screen in the 4x1 character cell. If you do the sums you'll see that &C000 gives the top line of pixels, &C020 the second and so on. These addresses, together with the contents

Part XX of MIKE BIBBY'S guide to machine code

determine the colours of the first eight pixels.

You probably know that our character set is designed on an eight by eight grid of pixels, so in this mode one screen memory byte holds information on pixels one character wide.

In other words &C000 determines the top line of pixels of the top leftmost character on the screen. &C001 gives us the pixels of the character next to it and so on. This assumes that the screen hasn't been scrolled - a situation I engineer by setting the mode in each of my



Figure 1: The first character row's memory map

Screen Location	Binary contents	Pixel pattern
&C000	0 0 0 1 1 0 0 0	■ ■ ■ ■ ■ ■ ■ ■
&C800	0 0 1 1 1 1 0 0	■ ■ ■ ■ ■ ■ ■ ■
&D000	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&E000	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&F000	0 1 1 1 1 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&FB00	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C000	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C020	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C040	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C060	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C080	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C0A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C0C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C0E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C100	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C120	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C140	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C160	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C180	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C1A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C1C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C1E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C200	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C220	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C240	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C260	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C280	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C2A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C2C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C2E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C300	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C320	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C340	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C360	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C380	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C3A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C3C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C3E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C400	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C420	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C440	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C460	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C480	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C4A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C4C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C4E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C500	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C520	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C540	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C560	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C580	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C5A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C5C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C5E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C600	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C620	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C640	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C660	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C680	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C6A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C6C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C6E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C700	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C720	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C740	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C760	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C780	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C7A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C7C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C7E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C800	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C820	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C840	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C860	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C880	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C8A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C8C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C8E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C900	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C920	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C940	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C960	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C980	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C9A0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C9C0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&C9E0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CA00	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CA20	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CA40	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CA60	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CA80	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CAA0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CAC0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CAE0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CAC0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CAE0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CAF0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CB00	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CB20	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CB40	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CB60	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CB80	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CBA0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CBC0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CBE0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CC00	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CC20	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CC40	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CC60	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CC80	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CCA0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CCC0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CCD0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CCE0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CCF0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CD00	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CD20	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CD40	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CD60	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CD80	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CDA0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CDC0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CDE0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CDF0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CE00	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CE20	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CE40	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CE60	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CE80	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CEA0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CEC0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CEE0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CEF0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CF00	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CF20	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CF40	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CF60	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CF80	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CFA0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CFC0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CFE0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■
&CFF0	0 1 1 0 0 1 1 0	■ ■ ■ ■ ■ ■ ■ ■

Figure 2: How A of 1, 1 is encoded in Mode 0

Screen Location	Hex Contents	Binary Contents	Pixel Pattern
\$0000	\$01	0 0 0 0 0 0 0 1	
\$0001	\$03	0 0 0 0 0 0 1 1	
\$0002	\$07	0 0 0 0 0 1 1 1	
\$0003	\$0F	0 0 0 0 1 1 1 1	
\$0004	\$1F	0 0 0 1 1 1 1 1	
\$0005	\$3F	0 0 1 1 1 1 1 1	
\$0006	\$7F	0 1 1 1 1 1 1 1	
\$0007	\$FF	1 1 1 1 1 1 1 1	

Figure 11. How Program 1's character is created

necessary to give the triangles, are shown in Figure 11.

You'll see that these contents are identical to the bytes in the sequence of DEFBs following character. There are eight bytes of data, so the main part of the program consists of a GJNZ loop—print—which puts these into the required memory locations. We use DE to point to the data and HL to point to the memory location we want.

Have you noticed that within the same character cell each pixel line is separated from the one above it by \$800? If not, notice it now — any of the first three figures shows the pattern.

What Program 1 does is to point at \$C008 with HL, put the data into it from where DE points via AJ and then increase HL by \$800.

Now the obvious way to do this is by:

```
LD BC,de
ADD HL,BC
```

Unfortunately you can't add a constant to a register pair. In general, if you're adding the hex number &800 to HL you have to use something like: which uses a register pair, or else the longwinded:

```
LD A,L
ADD A,8h
LD L,A
LD A,H
ADD A,8h
LD H,A
```

Notice the ADC to take in any overflow from L.

However, in the case of Program 1, since we're adding \$800, the ADD A,8h would roll down to ADC A,&0, which isn't going to change A — and hence L — at all. Nor will it set

Carry

This means we can ignore the hi byte addition and simply do the hi byte part by adding &8 to H. We accomplish this with:

```
LD A,H
ADD A,8h
```

```
LD H,A
```

So each time through the loop we load (HL) with the contents of (DE) with:

```
LD A,(DE)
LD HL,A
```

DE is then incremented so that it points to the next set of data, after which HL is increased by \$800 so that it points to the next pixel line down.

I suggest that you work through Program 1 and really get to grips with it before reading the rest of this article. Also you might like to see it, as what I'm going to suggest in a moment will crash the machine!

You see, Program 1 works because it assumes that the first data byte is poked into the location corresponding to the top line of pixels of a character cell. If this is so, successive pixel lines are indeed \$800 apart.

Suppose, however, we started "printing" our data midway down a character row. Say we chose to put our first data byte into \$C000, which you'll see from Figure 1 is halfway down the first character cell.

Incrementing this successively by \$800 as Program 1 does takes us to \$C800, then \$F000 followed by \$FF00. This results in the correct bytes being filled in.

However when we then go on to add \$800 to \$FF00 we cycle round to \$0000, which certainly isn't in screen memory. In fact, if we start to poke our data into this area we'll almost certainly crash the machine. Try it by changing start in Program 1 to

\$800

What's happening is that we're crossing a "low boundary", and, as you'll see from Figure 1, the memory locations in the columns of the second character row don't follow on simply from those in the first.

After \$FF00 we went to go to \$C000. Well the loop of Program 1 adds \$800 anyway, which takes us to \$0000 and — vivaldi! — sets the Carry flag at the same time. Adding

800 Assembler V.2

```

From... 1      000 00000
              .setbyte=0C00
              .start=0C08

0000:00 0C      LD A,0
0000:01 0C 0C     DEX, setbyte
0000:02 17 00     LD DE,character
0000:03 26 03     LD H,Start
0000:04 09       LD B,0
0000:05 00       print
0000:06 14       LD A,(DE)
0000:07 1C       LD HL,A
0000:08 7C 0C    LD A,B
0000:09 00 00    ADD A,0h
0000:0A 07 03    LD B,A
0000:0B 08 17    DEXI print
0000:0C 00       BT
0000:0D 17       .character
0000:0E 00 00    DEXI HL
0000:0F 00 00    DEXI HL
0000:10 07 00    DEXI HL
0000:11 07 00    DEXI HL
0000:12 1F 00    DEXI HL
0000:13 1F 00    DEXI HL
0000:14 1F 00    DEXI HL
0000:15 0F 00    DEXI HL
0000:16 00       DEXI

```

Program 1

MACHINE CODE

From Page 31

&B00 to the bottom line of pixels of any character row — that is, the pixels just above the row boundary — will cause Carry to be set, since these pixels are &F800 or greater.

We can detect the Carry and then take corrective action. In the case of the Carry generated by adding &B00 to &F800, we can get to the next location we want (&C050 - from Figure 3) by adding a further &C050 since:

$$\&F800 + \&B00 + \&C050 = \&C050$$

Now that we've reached a new character row, we can get the next location "down" by adding our usual &B00.

A careful study of Figure 1 will show that, once Carry is detected, adding &C050 will take us to the correct next location. Imagine crossing the row boundary after filling in &F84F:

$$\begin{aligned} &\&F84F + \&B00 + \&C050 \\ = &\&F900 + \&4F + \&B00 + \&C050 \\ = &\&D000 + \&4F + \&C050 \\ = &\&C05F \end{aligned}$$

Program 11 takes advantage of this to allow us to start our character at any line of pixels within a character cell - in this case at &C028, halfway down column 41. Figure 1V shows what's happening. The code is identical to Program I until after the &B has been added to A, and A transferred to H. Then, instead of an immediate DJNZ we check for Carry. If there is no Carry we branch to endloop, since we haven't crossed a row boundary and no remedial action is required.

If, however, there is a Carry, we've crossed a row boundary, and HL is pointing to some low memory location well away from screen memory.

To add the corrective &C050, we use the &C register. First, though, we

Screen Location	Hex Contents	Screen Content
&C028	&01	Screen half of first character row
&C029	&00	
&F028	&01	
&F029	&0F	Row boundary
&C02E	&0F	
&C02F	&0F	
&C030	&0F	
&C031	&0F	Top half of second character row

Figure 10: Location address

RAM Address 1.1	Hex 10000	Hex 10001	Hex 10002
RAM...	00	00	00
&&&&	.SetMode=&B00	&&&&0F	00
&&&&	.Start=&C028	&&&&01	00
&&&&00	LD A,0	&&&&02	0F
&&&&01	LD HL,&C028	&&&&03	0F
&&&&02	LD HL,Start	&&&&04	0F
&&&&03	LD B,0	&&&&05	0F
&&&&04	.print	&&&&06	0F
&&&&05	LD A,&01	&&&&07	0F
&&&&06	LD HL,A	&&&&08	0F
&&&&07	INC HL	&&&&09	0F
&&&&08	LD B,B	&&&&0A	0F
&&&&09	ADD A,B	&&&&0B	00

Program 11

push its contents out of harm's way so to the stack since B is used as a counter by DJNZ, restoring them before encountering DJNZ. The code that effects this is:

PUSH BC
LD HL,&C050
ADD HL,BC
POP BC

Given this, Program 11 shouldn't be too hard to follow. If you are having problems, these points might help:

- Remember that the bottom line of pixels are mapped by &F800 upwards. This isn't accidental, it's the

way the hardware is put together.

- Adding &B00 to &F800 gives you &A000 and sets Carry. Adding &B00 to &F801 gives you &A001 and sets Carry...and so on for all the pixels on the bottom line of every character row.

- &C050 isn't a magic number. It's just that there are &50 - &00 - bytes allocated to a line of pixels across the screen. The screen starts at &C000, so when we loop back past &C050 we add this to get back into screen memory.

This, though, will take us to the top line of pixels of the row we've just left.

RAM Address 1.2	Hex 10000	Hex 10001	Hex 10002
RAM...	00	00	00
&&&&	.SetMode=&B00	&&&&0F	00
&&&&	.Start=&C028	&&&&01	00
&&&&00	LD A,0	&&&&02	0F
&&&&01	LD HL,&C028	&&&&03	0F
&&&&02	LD HL,Start	&&&&04	0F
&&&&03	LD B,0	&&&&05	0F
&&&&04	.print	&&&&06	0F
&&&&05	LD A,&01	&&&&07	0F
&&&&06	LD HL,A	&&&&08	0F
&&&&07	INC HL	&&&&09	0F
&&&&08	LD B,B	&&&&0A	0F
&&&&09	ADD A,B	&&&&0B	00

Program 12

When the press use each's words as "phenomenal", "outstanding", "total and Work Every Time", they've obviously discovered something rather special.

But when that something special turns out to be a product in which they are already invested, then it must be something very special indeed.

The secret of their enthusiasm is AMX Pagemaker — a revolutionary software program that will produce newspapers, journals, leaflets, notices and hand-outs — in fact anything where text and graphics are required, to an extraordinary professional standard.

It's a complete graphics design system and word processor rolled into one. It has real time graphics refresh (not continuous scrolling) and offers an A4 page and user Main 2, the highest graphics resolution on the Amstrad CPC computers.

READ ALL ABOUT IT

You can type directly onto the screen, with any of the 15 typefaces supplied or design your own, alternatively, you can load in any ASCII file in a word processor file, from programs such as Tascwin, Amstrad, Megas, or Protext, with full automatic on-screen text formatting during loading.

Word processing facilities such as underlining, right and left margin justification are all available. There is full page resolution control over text and graphics. Also included is a nice spacing facility.



The program that's making front page news.

EXTRA, EXTRA

There are outstanding facilities for drawing, graphics and painting, using either the patterns supplied, or your own pattern designs. A screen colour monitor is included allowing screens created in Mode 1 and Crt to be used within the Pagemaker. The out and paste facilities include copying, moving, rotating, stretching and a fantastic screen rotate available.

The program allows you to save three A4 pages at any time before work is output to an early range of dot matrix printers including Amstrad (AMP 1000-10000), Epson (EPSON/LA/1), Canon (P/N 10000), Sage (SAGE), Memorex (M/1 80+), Tektronix (T/1 10000), Star (Star), Star (S200) and any that are compatible with the above.

The AMX Pagemaker requires an Amstrad CPC/Color or an Amstrad CP/Color or CPC computer with an Amstrad CPC/Color or CPC/Color. Minimum system files = disc drive, EP/Tronics Ram board or compatible.

Let's hear the last word to the press.

"Pagemaker" is phenomenal — it leads itself to creating anything where text and graphics are involved — notices, posters, letters, hand-outs, newsletters. Packages like this have been the province of the 16-bit micro until now, this product is worth every penny of £49.95."

AMX PAGES MAKER: WE THOUGHT IT WAS ABOUT TIME WE GOT YOUR FEELING.

A combination of AMX Pagemaker and the AMX video-digiter. Using any video that provides a composite signal and the digiter, images from a camera or TV can be converted into digital images on the Amstrad Micro. They can then be used within AMX Pagemaker to duplicate magazines or newsletters. The digiter connects into the expansion port and scans a complete picture in only 3 seconds.

A special print dump routine is also included with the demo programs. This is specially designed to produce fast, current high-resolution pictures, with reduced "jittering" resulting in a very accurate reproduction of the original.

- dot resolution 256 by 256
- Standard 1 set composite video input
- 100M RAM connector plus 32 grey scale output
- Line E count
- Contrast and brightness control
- No potential power unit required

These packages are your opportunity to join the exciting publishing revolution.

The AMX Pagemaker costs only £49.95, software is supplied on 2 disc and a fully illustrated

operating manual. AMX Digiter only £99.95 including software on 2 discs, and AMX Magazine Maker including AMX Pagemaker and AMX Digiter at any £129.95.

These expert packages are available from all good computer dealers or direct using the Freepost order form below.

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From Page 32

We want to move down one character row. And, owing to the screen memory layout, this is 800 bytes further on. Altogether, then, we add 8C00.

Any remaining doubts you've got are sure to be settled by a careful inspection of Figure 1. Try extending it by a couple of rows and you're bound to see the pattern.

Right, we've managed to get one character on the screen, but how do we manage to get two characters side by side?

You might think that we print one character as in Program II, then alter HL to point to the start of the next character and repeat.

However we can take advantage of the fact that the characters are adjacent. If HL is pointing to 8C000

say, filling it with data will give us the eight pixels of the top line of that column. We can then fill the pixel lines of the character next to it by simply increasing HL by one to 8C001 and loading the appropriate data. We could fill the next one along by increasing HL to 8C002, and so on.

Having filled in however many top line pixels we require, we then set HL back to the second pixel line down of the first character and move along again by increasing HL. That is, we do all the pixels in a line before we move on to the next line down.

In practice we modify Program II so that it contains an inner loop — counted by C — that uses INC HL to step across the required addresses for the line of pixels making up the top line of our character.

Before we start changing HL we

PUSH it on to the stack so that it's ready for POPping back when we want to move on to the next line of pixels by our standard trick of adding 8000 and checking for Carry.

We introduce a new identifier, *width*. This controls the loop that determines how many times we increment HL — that is, how many columns our data spans. Our *print* routine then becomes:

```

.print
PUSH HL
LD C,width
LD B,160
LD HL,8
INC HL
INC HL
DEC C
DR HL,raw
POP HL
    
```

Notice that the format of our data has changed: The data bytes for the all first line of pixels (two bytes in this case) are given before those for the second line and so on.

Finally, Program IV uses these techniques to print a two by two grid of characters. Actually all we've done is to introduce the identifier *depth*, and set it to the number of pixel lines we want printing. Making it 16 gives us two character rows in depth, 24 makes it three and so on.

Remember we've using nested loops, so that all the pixels required on one line are filled before we move down on to another line. *B*, loaded with *depth*, controls the outer loop, while *C*, loaded with *width*, controls the inner.

Apart from that, Program IV is much the same as Program III, though of course it's got far more data attached. Try using it to print out, say, a three by four character pattern. Your only problem should be working out the data!

The techniques we've covered this month are really fundamental sprite routines. All right, we don't move them about, and they're not multi-coloured, but we have got the essentials.

● *Next month*, in the last part of the series, we'll see how the Machine 0 and 7 screens are composed, and tidy up some *video* stuff.

RAM Address	Hex	ASCII	HEX	HEX
0000	00	00	00	00
0001	00	00	00	00
0002	00	00	00	00
0003	00	00	00	00
0004	00	00	00	00
0005	00	00	00	00
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0008	00	00	00	00
0009	00	00	00	00
000A	00	00	00	00
000B	00	00	00	00
000C	00	00	00	00
000D	00	00	00	00
000E	00	00	00	00
000F	00	00	00	00
0010	00	00	00	00
0011	00	00	00	00
0012	00	00	00	00
0013	00	00	00	00
0014	00	00	00	00
0015	00	00	00	00
0016	00	00	00	00
0017	00	00	00	00
0018	00	00	00	00
0019	00	00	00	00
001A	00	00	00	00
001B	00	00	00	00
001C	00	00	00	00
001D	00	00	00	00
001E	00	00	00	00
001F	00	00	00	00
0020	00	00	00	00
0021	00	00	00	00
0022	00	00	00	00
0023	00	00	00	00
0024	00	00	00	00
0025	00	00	00	00
0026	00	00	00	00
0027	00	00	00	00
0028	00	00	00	00
0029	00	00	00	00
002A	00	00	00	00
002B	00	00	00	00
002C	00	00	00	00
002D	00	00	00	00
002E	00	00	00	00
002F	00	00	00	00
0030	00	00	00	00
0031	00	00	00	00
0032	00	00	00	00
0033	00	00	00	00
0034	00	00	00	00
0035	00	00	00	00
0036	00	00	00	00
0037	00	00	00	00
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003B	00	00	00	00
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003D	00	00	00	00
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0040	00	00	00	00
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0049	00	00	00	00
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0050	00	00	00	00
0051	00	00	00	00
0052	00	00	00	00
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0054	00	00	00	00
0055	00	00	00	00
0056	00	00	00	00
0057	00	00	00	00
0058	00	00	00	00
0059	00	00	00	00
005A	00	00	00	00
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0061	00	00	00	00
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0064	00	00	00	00
0065	00	00	00	00
0066	00	00	00	00
0067	00	00	00	00
0068	00	00	00	00
0069	00	00	00	00
006A	00	00	00	00
006B	00	00	00	00
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006E	00	00	00	00
006F	00	00	00	00
0070	00	00	00	00
0071	00	00	00	00
0072	00	00	00	00
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0074	00	00	00	00
0075	00	00	00	00
0076	00	00	00	00
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007F	00	00	00	00
0080	00	00	00	00
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0090	00	00	00	00
0091	00	00	00	00
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0094	00	00	00	00
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00A0	00	00	00	00
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00A4	00	00	00	00
00A5	00	00	00	00
00A6	00	00	00	00
00A7	00	00	00	00
00A8	00	00	00	00
00A9	00	00	00	00
00AA	00	00	00	00
00AB	00	00	00	00
00AC	00	00	00	00
00AD	00	00	00	00
00AE	00	00	00	00
00AF	00	00	00	00
00B0	00	00	00	00
00B1	00	00	00	00
00B2	00	00	00	00
00B3	00	00	00	00
00B4	00	00	00	00
00B5	00	00	00	00
00B6	00	00	00	00
00B7	00	00	00	00
00B8	00	00	00	00
00B9	00	00	00	00
00BA	00	00	00	00
00BB	00	00	00	00
00BC	00	00	00	00
00BD	00	00	00	00
00BE	00	00	00	00
00BF	00	00	00	00
00C0	00	00	00	00
00C1	00	00	00	00
00C2	00	00	00	00
00C3	00	00	00	00
00C4	00	00	00	00
00C5	00	00	00	00
00C6	00	00	00	00
00C7	00	00	00	00
00C8	00	00	00	00
00C9	00	00	00	00
00CA	00	00	00	00
00CB	00	00	00	00
00CC	00	00	00	00
00CD	00	00	00	00
00CE	00	00	00	00
00CF	00	00	00	00
00D0	00	00	00	00
00D1	00	00	00	00
00D2	00	00	00	00
00D3	00	00	00	00
00D4	00	00	00	00
00D5	00	00	00	00
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00D7	00	00	00	00
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RAIMBERD'S Advanced Music System is an upgrade of their original Music System. It runs on the 486, 664 and 512B and is quite simply the best software music editor you can buy for these machines.

It basically consists of five interlinked modules – a keyboard, an editor, a synthesiser, a linker and a printer. All are controlled from a main screen divided into graphic representations of devices. You move around these devices on a circuit, and as each becomes active, it is highlighted by a 3D shadow effect.

The principal screen area is a window on to two staves (treble and bass) and notes can be entered either directly or via the top two lines of the computer keyboard configured as a piano. Envelope selection, dynamics, accidentals, metronome settings and other parameters are controlled either by icons or pull-down menus. Note information is stored in memory, and can later be saved to disc.

The keyboard is a real-time recording device for the three available sound channels (voices), and notes are sounded according to the current settings for envelope and dynamics. The range is just under two octaves, but this can be extended to the full range of the sound chip by using an octave-shift device. You can record only one voice at a time, but you can keep in sync by playing back the tracks already stored while recording. If you make a mistake it is a simple matter to overwrite the whole or part of a voice.

As you play, notes of the correct pitch and duration appear in the score

The Advanced Music System

GABRIEL JACOBS reports on a software music editor

window. Bar-lining is automatic, with ties being inserted where necessary, though the facility can be manually overridden for odd-sized bars.

In Edit mode you can enter music without the pressures of real-time recording, and edit note information recorded via the keyboard. All three voices can be displayed, and scrolled and zoomed from and to any point.

The editor has all the facilities of the keyboard for bar-lining, envelope settings and so on, but works with a combination of pull-down menus and various keystrokes.

There is a wide range of editing features – notes and rests can be inserted or deleted, note stems inverted, dynamic markings and repeat signs added, and slash notes. There is even a buffer, called a compass, for holding half-baked ideas which can later be edited and inserted into a composition.

If you're used to using envelopes

you'll be impressed with how easily they can be controlled with the synthesiser module. If you haven't used envelopes before you'll be amazed at what you can create, from gentle sustained vibratos with long decays, to wild, strongly attacked pitch slides. With your Amstrad hooked up to a hi-fi system the effects can be stunning.

With the synthesiser the excellent graphics really come into their own. There is total flexibility in using all envelope parameters, but you are shielded from the complexities of envelope creation and modification with, once again, a circuit of devices, and beautifully drawn pitch and amplitude graphs.

These can be used to experiment with sound shapes. The current shape can be sounded at any time without leaving the module, and when you're satisfied with the result the envelope can be incorporated into a tune, or stored for future use.

The main synthesiser screen can be popped up at any time. The devices it contains are used to switch between the pitch and amplitude graphs, and to set the envelope number, any of 31 noise numbers for percussive effects, step sizes, step numbers and the general shape of the graphs.

Two sets of seven envelopes are available. Only one set can be active, but a swapping facility allows you to swap envelopes from the inactive set into the active one.

The Linker will handle a sequence



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HAVY on the Magick is yet another viciously convoluted puzzle from Garbage Games. It is essentially a four level maze in 3D and, even with a map, it can be mind boggling to trace out the best routes.

In order to progress you need plenty of stamina – you have levels for stamina, skill and luck – and there is a way of getting far more than the authors intended. You start in room 2.44 – that is level 2 and counting from the top left.

If you pick up the Grimoire you will notice that your skill increases by eight points because a Grimoire is a book of spells and that your stamina drops by one point because a Grimoire usually weighs about 10lb. Now type in the following:

Q for Options.

S Select Restore of the character Aid.

R to start the Restore.

Esc break out of Restore

and you are back at the start. The Grimoire is back on the table, but you have still got the extra skill points.

By repeating this sequence you can build up your skill to 99 points, and by using the realistic option you can pass this value on to stamina and then luck.

With such high levels of stamina, skill and luck you can now blast almost anything, so go round to the

Monsters and mazes

ALEATOIRE delves into more dungeons in search of adventure

nearest monster – a Wyvern in room 3.52 – and turn it to a critter, thus gaining two experience points.

Then do the Options trick and the Wyvern is resurrected for another blast, thus building your experience up to any desired level – and you haven't even started to play the game yet.

So with a wealth of experience, skill and stamina it's time to make your way in the underworld.

The first thing is to get promotion from Neophyte to Zelator, so go to room 2.32 and use DOOR.SILENCE – this is a tip from Apex who, when not standing on you, can be very helpful. Enter the room and you are promoted to grade 2.

To get to the next grade you have to learn how to open locked doors. Some need a password, as above,

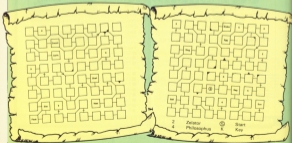
some a bag of gold – two circles indicate such doors – and the remaining 12 demand the right key.

Now all 12 keys are of different metals, but more important is that they are marked by a sign of the zodiac as shown in Figure 1.

In order to work out which key opens what you can ignore the metal and just associate the sign of the zodiac with the following names of 12 rooms with locked doors.

I leave this as an exercise for any interested reader – Ichthys (or Fish), Pith, Two, Purity, Mani – pronounced Narny?, Rain, Scales, Horns, Arrows, Stings, Flox – or Wool?, Glass.

Having sorted that out you should be able to open most doors, so now is get promotion to Practitioner – or grade 3 – by visiting room 3.56 via



Level 1 - top

Level 1

WATERFALL, the Room of Rains using the Aquarius key, and **DOORLAZA** - start for LAZARUS, but why is a long, strange bird story.

If you now get the sword in room 1,11 you can safely summon up the demon Astarot. Now say **ASTAROT, LICHGATE** and the mention of the little gate with a roof where coffins have to wait will take you to the ruby in room 4,56.

Actually the ruby is no help yet because you have to be a Philosopher - grade 4 - before you can use it to invoke Aemodé, the top demon.

Hopefully these tips will give you a feel for this excellent game without spoiling it. I have been to all three exits, but that is partly due to a great deal of help from three other people and my high level of stamina.

I do not know how to get rid of all the monsters, so all I can do is freeze them for a couple of seconds and then push past as quickly as possible. Slugs are not too debilitating, but the waterwolves were murder until I found the ruggat - or rugat - of silver.

PUZZLE

Still stuck in the dungeons for this month's puzzle, but they only have an East and West door and stretch for miles in both directions.

Your task is to check if they are empty. You have been given a set of

Room	Metal	Sign
1,2	Chrome	Signarius
1,23	Zinc	Scorpio
1,24	Tin	Cancer
2,6	Latic	Gemini
2,8	Alum	Virgo
2,37	Copper	Pisces
2,47	Nickel	Leo
3,2	Bronze	Aries
3,5	Magnium	Capricorn
3,80	Calcium	Aquafius
3,84	Brass	Libra
4,24	Iron	Taurus

Figure 1. The better tips

cards with instructions that you must follow to the letter and a number of bricks to mark whether you have been in a room or not.

You start in an empty room and the cards, starting from 0, read as follows:

0. IF room is empty THEN (drop brick, go east and obey card 1), ELSE (get brick, go west and obey card 2).
1. IF room is empty THEN (drop brick, go east and obey card 2), ELSE (go west and obey card 4).
2. IF room is empty THEN (drop brick, go west and obey card 0), ELSE (get brick, go east and obey card 3).
3. IF room is empty THEN (drop brick, go west and obey card 2), ELSE (go east and obey card 0).
4. IF room is empty THEN (go east

and obey card 3), ELSE STOP.

The question is how many rooms have you visited before you come to the STOP on card 4?

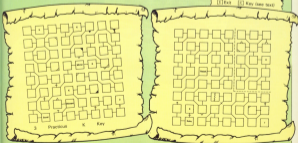
SOLUTION

A number of people have had a go at Ramanujan's puzzle from the August 1988 issue of *Computing with the Amstrad* with varying degrees of success. One reader had a program running for three days without any solution, so it was a relief to get the first correct answer from Mr B.S. Parkes of Cheltenham.

Mr Parkes wrote a lengthy letter partly in appreciation of my analysis of Knights, partly in appreciation of giving some guidelines and facts about the Ramanujan problem. Then he said: "I set the new search going at 1.48pm on July 8. It located the solution of:

$$69^2 + 169^2 = 133^2 + 134^2$$

at about 9.20pm". I congratulate him on his performance which beat my first program by over two hours - of course it can be made to run a lot faster once you know the answer. ■



Level 2

Level 4 - BATH

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Sending mailbox messages to other subscribers, whose numbers are rapidly growing, is the cheapest form of communication possible. You can send a message of any length to another mailbox for less than the cost of a few-line stamp. And it doesn't cost a penny more to send the same message to 100 different mailboxes! Even a message sent to a mailbox on the other side of the world only costs 50p.

The biggest bulletin board of them all

The number of bulletin boards is growing rapidly. The only way is that the user reports are single user boards - which means lots of other people are also trying to make contact and all too often all you get is the message! Now, with the MicroLink bulletin board there is no limit to the number of people using it at the same time. And no limit to the number of categories that can be displayed on the board.

Give your micro mainframe power

With MicroLink your micro becomes a terminal linked directly to the Telecom Gold mainframe computer, and able to tap its tremendous power and versatility. Right away you'll be able to use your number-crunching programs that can only run on a mainframe.

The mailbox that is always open

MicroLink is in operation 24 hours a day, every day. That means you can access your mailbox whenever you want, and from wherever you are... home, office, airport - even a hotel bathroom or golf club! No-one needs to know where you are when you send your message.

We're only a local phone call away

The majority of MicroLink subscribers can connect to our mainframe computer in London by making a local phone call. This is possible because they use British Telecom's PPS system, which has access points all over Britain. A local phone call is all you need, too, for direct access via MicroLink to all the other computers belonging to the international Datacom system.

Telemessages - at a third off

The modern equivalent of the telegram is the telemessage. Send it before 11pm and delivery is guaranteed by the post the following day (except Sundays). The service was intended for people phoning their message to the operator, which costs £1.00 for 100 words. But you can now use it via MicroLink, for only £1.00 for up to 300 words! For an extra 50p your message can be delivered in an attractive greetings card.

Go teleshopping on your micro

With MicroLink you can study the British flag monthly - and then buy your ticket in advance. You can book theatre tickets. And even order a bouquet of flowers. It's all part of the tele-shopping revolution!

Send and receive telex messages

With MicroLink you can turn your micro into a telex machine, and can send and receive telex messages of any length. You will be able to communicate directly to 96,000 telex subscribers in the UK, 1.1 million worldwide - and even with ships at sea via the telex satellite network. Business people can now send and receive always after office hours, from home or when travelling.

What does it all cost?

Considering all the services you have on the MicroLink is remarkably inexpensive. You pay a once-only registration fee of £5, and then a standing charge of just £5 a month. On-line costs are 50p a minute (between 7pm and 9pm) and 10p a minute during office hours. There is an additional 10p a minute PPS charge if you are calling from outside the UK. London call area. Charges for telex, telemessages and storage of files are given on the next page.

How much it costs to use MicroLink

Initial registration fee: £5.

Standing charge: £1 per calendar month or part.

Connect charge: 30p per minute or part - cheap rate, 11p per minute or part - standard rate.

Applicable for duration of connection to the Service Address charge 2 minutes.

Charge varies from Service Area, Monday to Friday of day, Saturday and Sunday and public holidays. Standard rate is from 9pm to 5pm, Monday to Friday excluding public holidays.

Filing charge: 20p per unit of 2048 characters per month.

Applicable for storage of information, such as letters, short notes and mail files. The number of units equals an average calculated by reference to a daily sample.

Taxes registration: £10.

Shipping taxes: 1/4p per 100 characters (US), 11p per 100 (Australia), 14p per 100 (N. America), £1.25 per 400 (Rest of world), £2.75 per 400 (Other) (tax).

Delivered messages sent on the night service are subject to a 50p per unit surcharge.

Incoming calls: No charge.

It is not possible to deliver a letter without a mailbox reference. If a letter is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address. Each user obligated for taxes and using the facility, will

incur a charge of 4 storage units a month. Further storage charges result in increased depending on the amount of extra storage and the use mode of short code and message file facilities.

MicroLink PMS service: 20p per minute or part (300/600), 3p per minute or part (1200/75/600).

Only applies to users outside the UK, London and area.

Telemessages: £1.45 for up to 300 words. Telemessages are transmitted (limited) printing cost for 75p extra.

Redirection: No charge.

If you have a BT Redirection you can be posted automatically whenever a message is waiting in your mailbox.

International Mail: For the first 2048 characters - 20p to Germany and Denmark, 30p to USA, Australia, Canada, Singapore, Hong Kong and Israel. For additional 1024 characters - 10p, 15p.

These charges relate to the transmission of information by the British service to other Customs areas outside the UK and the Isle of Man. Multiple copies to addressees (the same system function only one transmission charge).

Billing and Payment: All charges quoted are exclusive of VAT. Currently all bills are rendered monthly.

Software over the telephone

MicroLink is setting up a central store of software programs which you'll be able to download directly into your main. The range will include games, utilities, educational and business programs, and will cover all the most popular makes of micro.

Talk to the world - by satellite

MicroLink is part of the international Dialcom network. In the USA, Australia and a growing number of other countries there are many thousands of users with electronic mailboxes just like yours. You can contact them just as easily as you do users in Britain - the only difference is that the messages from your keyboard go speeding around the world via satellite.

What you need to access MicroLink

You must have the following in order to use MicroLink: a computer (it can be any make of micro, hand held) device or even an electronic typewriter provided it has communications facilities; a modem (it can be a simple Parrot type using 1200/75 baud, or a more sophisticated one operating at 300/300 or 1200/1200 baud); and appropriate communications software.

MicroLink

in association with

TELECOM GOLD

Application Form

✓ We hereby apply to join MicroLink. CWA/11

✓ I/We have my/our charges for all payable to Database Publications in registration fee to MicroLink.

✓ I/We intend to use Telex. I authorize you to charge an additional £10 to my credit for validation.

✓ I confirm that I am over 18 years of age.

✓ I understand I accept the terms and conditions for the time being in force, a copy of which are available on request.

Entered from the following computer: _____

Signature _____

Date _____

FOR OFFICE USE ONLY

Mailbox assigned _____

Term date _____

Payment _____

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Harold Cross
Newspaper MK9 3NY.

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Position
Company
Address

Postcode District telephone

Commencement of Service
Please indicate month of commencement 14
After 10 days for validation of mailbox.

Payment
While Database Publications is the sole supplier of the service to you, the commission and filing charges will be handled by Telecom Gold as agents for Database Publications Ltd. Date of first payment to be an £10 of month following commencement. Please complete filing authorization form A, B or C below.

✓ I **A. Direct Debiting Method** (Over 18 postal address of Bank Branch)
To

I/We authorize you until further notice in writing to charge to my/our account with you or immediately after 10th day of each month unspecified amounts which may be debited from us at the instance of British Telecommunications plc - TELECOM GOLD. We warrant that you will advise before date is your card.

Name of Account to be debited
Account Number

✓ I **B. Please debit my/our Account/Via American Express account number**
* American subscribers only.

I/We authorize you until further notice in writing to charge to my/our account with you or immediately after 10th day of each month unspecified amounts which may be debited from us at the instance of British Telecommunications plc - TELECOM GOLD. We warrant that you will advise before date is your card.

✓ I **C. Please invoice the company/authority.**
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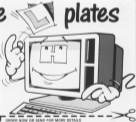
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Gunpowder Plot

IN GUNPOWDER Plot you play Guy Fawkes, bent on blowing up the Houses of Parliament. To do this you have to plant gunpowder in the form of large fireworks under the surrounding lawns, and when you've planted enough they will blow the buildings sky-high.

Plant the gunpowder by stepping on to the lawn. As you do so grass is removed at the point where the gunpowder is planted. However if you step on the same area again the gunpowder is removed and replaced by grass.

The government is not so stupid as to leave intruders wandering around the gardens at will, so they have two dangerous karate masters on guard.

Dangerous they might be, but bright they are not, so to camouflage them mines are concealed around the gardens. Contact with any of them ensures instant death.

From time to time a special worker will appear and dig up your gunpowder. He moves quite quickly, but you can see him off by bumping into him.

To even things up for you every now and then an accomplice will drop flash bombs down to the garden from his helicopter. When you pick them up they explode, and the intense light blinds the guards and disables the mines for a while.

The game has five levels of difficulty controlling the speed of the guards and the flash bombs' power, and your points increase accordingly. You control Guy using the standard A, Z, K and L keys or a joystick.

There are two ideal ways to cheat. Firstly to help you debug your typing to extend the number of lives you can increase the variable *K* in line 1980 or remove line 7 from line 1760. Secondly you can get through a screen quickly by making the variable *con*=140 in line 2020. ■



GAME OF THE MONTH

By DAK LONG LAU

VARIABLES

H100	Top 10 scores.
H5104	Top 10 scores.
MA(20,20)	Screen map.
A(21,0)(2)	Guard's coordinates.
J(2)	Guard's direction.
MS	High score.
SC	Scores.
X	Guy's x coordinate.
Y	Guy's y coordinate.
MM	Digger's x coordinate.
MM	Digger's y coordinate.
DR	Guy's direction.
IR	Random number.
IN	Number of fireworks started.
SCR	Score number.
LS	Level.
VN	Number of high scores.
PO	Power of each bomb.

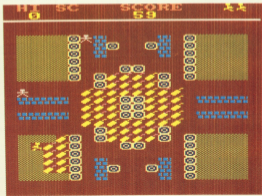
PROGRAM STRUCTURE

10-20	Initialization.
220-330	First screen.
340-400	Main loop.
400-500	Guy's movements.
500-1000	Guard's movements.
1030-1070	Digger's movements.
1080-1120	End of game.
1130-1170	Guy gets killed.
1180-2040	Initialization.
2050-2130	High score.
2140-2180	Enter high score's name.
2190-2210	Set up screen data.
2220-2230	Screen flash routine.
2240-2400	Instructions.
2410-2920	Miscellaneous subroutines.

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MicroLink

Full listing starts on Page 50



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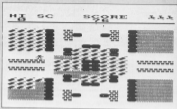
GAME OF THE MONTH

From Page 50

```

1000 GOTO 1010:GOTO 1010:GOTO 1000,10
1010:GOTO 1010,1000,1000
1010 PRINT "1000 1000"
1020 FOR A=PRINT CHR$(201):GOTO 1000
1030 GOTO 1030:GOTO 1000
1040 FOR A=PRINT CHR$(201):GOTO 1000
1050 GOTO 1050:GOTO 1000
1060 RETURN
1070 IF A=20 THEN GOTO 1000
1080 IF A=201 THEN GOTO 1000
1090 GOTO 1090:GOTO 1000
1100 IF A=100 AND A=101 THEN GOTO 1000
1110 THEN GOTO 1000
1120 GOTO 1000
1130 FOR A=PRINT CHR$(201)
1140 GOTO 1000
1150 FOR A=PRINT CHR$(201):GOTO 1000
1160 GOTO 1000
1170 FOR A=PRINT CHR$(201):GOTO 1000
1180 GOTO 1000
1190 FOR A=PRINT CHR$(201):GOTO 1000
1200 GOTO 1000
1210 FOR A=PRINT CHR$(201):GOTO 1000
1220 GOTO 1000
1230 FOR A=PRINT CHR$(201):GOTO 1000
1240 GOTO 1000
1250 FOR A=PRINT CHR$(201):GOTO 1000
1260 GOTO 1000
1270 FOR A=PRINT CHR$(201):GOTO 1000
1280 GOTO 1000
1290 FOR A=PRINT CHR$(201):GOTO 1000
1300 GOTO 1000
1310 FOR A=PRINT CHR$(201):GOTO 1000
1320 GOTO 1000
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1360 GOTO 1000
1370 FOR A=PRINT CHR$(201):GOTO 1000
1380 GOTO 1000
1390 FOR A=PRINT CHR$(201):GOTO 1000
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1410 FOR A=PRINT CHR$(201):GOTO 1000
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1570 FOR A=PRINT CHR$(201):GOTO 1000
1580 GOTO 1000
1590 FOR A=PRINT CHR$(201):GOTO 1000
1600 GOTO 1000
1610 FOR A=PRINT CHR$(201):GOTO 1000
1620 GOTO 1000
1630 FOR A=PRINT CHR$(201):GOTO 1000
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1650 FOR A=PRINT CHR$(201):GOTO 1000
1660 GOTO 1000
1670 FOR A=PRINT CHR$(201):GOTO 1000
1680 GOTO 1000
1690 FOR A=PRINT CHR$(201):GOTO 1000
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1750 FOR A=PRINT CHR$(201):GOTO 1000
1760 GOTO 1000
1770 FOR A=PRINT CHR$(201):GOTO 1000
1780 GOTO 1000
1790 FOR A=PRINT CHR$(201):GOTO 1000
1800 GOTO 1000
1810 FOR A=PRINT CHR$(201):GOTO 1000
1820 GOTO 1000
1830 FOR A=PRINT CHR$(201):GOTO 1000
1840 GOTO 1000
1850 FOR A=PRINT CHR$(201):GOTO 1000
1860 GOTO 1000
1870 FOR A=PRINT CHR$(201):GOTO 1000
1880 GOTO 1000
1890 FOR A=PRINT CHR$(201):GOTO 1000
1900 GOTO 1000
1910 FOR A=PRINT CHR$(201):GOTO 1000
1920 GOTO 1000
1930 FOR A=PRINT CHR$(201):GOTO 1000
1940 GOTO 1000
1950 FOR A=PRINT CHR$(201):GOTO 1000
1960 GOTO 1000
1970 FOR A=PRINT CHR$(201):GOTO 1000
1980 GOTO 1000
1990 FOR A=PRINT CHR$(201):GOTO 1000
2000 GOTO 1000

```



```

1470 IF A=10 THEN GOTO 1000
1480 IF A=101 THEN GOTO 1000
1490 ON A=PRINT CHR$(201):GOTO 1000,101
0,100,100,100,100
1500 PRINT "1000 1000"
1510 FOR A=PRINT CHR$(201):GOTO 1000
1520 GOTO 1000
1530 FOR A=PRINT CHR$(201):GOTO 1000
1540 GOTO 1000
1550 FOR A=PRINT CHR$(201):GOTO 1000
1560 GOTO 1000
1570 FOR A=PRINT CHR$(201):GOTO 1000
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1590 FOR A=PRINT CHR$(201):GOTO 1000
1600 GOTO 1000
1610 FOR A=PRINT CHR$(201):GOTO 1000
1620 GOTO 1000
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1930 FOR A=PRINT CHR$(201):GOTO 1000
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1950 FOR A=PRINT CHR$(201):GOTO 1000
1960 GOTO 1000
1970 FOR A=PRINT CHR$(201):GOTO 1000
1980 GOTO 1000
1990 FOR A=PRINT CHR$(201):GOTO 1000
2000 GOTO 1000

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1700 GOTO 1000
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1910 GOTO 1000
1920 GOTO 1000
1930 GOTO 1000
1940 GOTO 1000
1950 GOTO 1000
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invented about 30 years ago by a group of IBM employees. Fortran - FORmula TRANslation - soon became the world's most important high-level computer language for maths and engineering applications.

Its success and portability prompted the American National Standards Institute - ANSI - to set up specifications for Fortran compilers. Current implementations of the language are still defined in terms of ANSI standards, notably those of 1966 and 1977.

It has to be said that Fortran is weak in certain areas. Because it was not originally designed to have powerful input/output facilities its file processing capabilities are limited.

Equally, formatting conventions are far more rigid than those of more recent high-level languages. For example, column alignment is absolutely strict, dating back to a time when program lines were entered on 80 column punched cards.

Fortran does have its strengths however, and these lie principally in its ability to crunch large amounts of numeric data. It also lends itself very easily to a modular structure, and herein is the real explanation for why it continues to survive and prosper.

The knock-on effect of its modular structure is that users have access to a vast array of ready-written subroutines - if it can be done on a computer somewhere, somewhere, will have it done in Fortran. For mainframe implementations of the language, sizeable libraries of subroutines are readily available.

For this reason dislodging Fortran from its mainframe foothold would at present be an almost impossible task. You fear it displaced even by those who use it daily, but you would get short shrift if you were to ask them to switch to another language.

NEVADA FORTRAN

**GABRIEL JACOBS and
MEHRDAD GHASSEMPOORY**
put a low-cost compiler and
editor through its paces

FEW would disagree that the least expensive product in a range is not necessarily the best value for money. Nevada Fortran, from Ellis Computing, USA, is by far the cheapest Fortran compiler on the market at just £35, with its nearest rival for CP/M machines easily topping the £200 mark.

With that sort of price differential it is hard to avoid saying that whatever the shortcomings of the product persuade programmers who need Fortran on a micro could do no better for their money.

Of course everything depends on requirements, and Nevada Fortran certainly has its deficiencies. Perhaps the worst of these is that it is slow - not only compared to its mainframe equivalents, but also to other micro-based compiled languages such as Turbo Pascal, see the bench mark listings in Figure 1.

However many potential users are likely to need it less for autonomous software development than for editing and testing modules downloaded from a mini or mainframe, or written and debugged on a PCW or CPC6128, then uploaded.

Given the frustrating response time of many multi-user systems an objectively slow compilation and program execution under CP/M might well seem to some like an express train, quite apart from what a micro can offer in reducing the nervous strain caused by screen messages warning that allocated CPU time will inevitably be exceeded.

It has to be said, however, that as a stand-alone language Nevada Fortran is somewhat restricted. It has no

link facility, so unlike some of its micro-based competitors such as MS-Fortran and Pro-Fortran, it does not come with a library of subroutines on disc, and all modules have to be compiled in one go.

It also produces threaded code - that is, it creates a CP/M executable file - with a .COM extension, by first loading a set of routines ready to be called from the assembled Object file.

As the program is executed it stitches together the original code and the routines sitting below it in memory. So, for instance, if the source contains an IF statement this is compiled into a subroutine call to the run-time module which performs it.

This is almost certainly why run times are so slow, but threaded code brings with it another disadvantage - the full run time package is loaded every time, regardless of what the Object code requires.

This means that all .COM files start with an overhead of 16k, a significant consideration on machines with 6k or less of TPA.

All in all if even moderate amounts of data have to be handled in run it is speed is of the essence Nevada Fortran is clearly not the language to choose for commercial software development on Amstrads. On the other hand it really comes into its own as a pocket companion to a mainframe compiler.

For a start it more or less conforms to ANSI X.39 1986 Fortran. We experienced no problems in transferring our test programs directly from a DEC VAX mainframe to a PCW when they ran without modification. We then edited and returned them to the

mainframe, again with no difficulty whatsoever.

For those in the know it is worth mentioning that Nevada Fortran does not support double-precision and complex arithmetic, statement functions, subscripted subscripts and a few other sophisticated facilities specified in ANSI-66.

However it does have some features which go beyond the 1966 standards, including free-format I/O, extended error-handling and IF-THEN-ELSE, ENCODE and DECODE facilities.

It also features a COPY statement for inserting source files into a program, direct in-line assembly language, random access to files and the ability to chain a series of programs.

As for the question of limited memory and disc storage on a micro this problem is partly solved by a run-time module which allows you to execute an Object file for testing purposes without creating a .COM file. And as a bonus the Object file itself is generated in very compact form, precisely because of the threaded code.

The documentation is clear, comprehensive and well organized, though as might be expected with a language aimed mainly at existing programmers it assumes familiarity with both Fortran and QRM.

If Nevada Fortran seems to fit your needs one essential will be to invest in ED80, Hi-Dart's all-purpose code editor. It is too much trouble to load LocoScript, WordStar and so on every time you need to make modifications to the source code.

ED80 takes up only 6k of memory and has WordStar-compatible facilities including direct cursor addressing, side scrolling and dynamic block handling.

There can be no doubt that a total of £50 or so for compiler and editor represents outstanding value for money. As Amstrad machines, particularly the PCW, are increasingly used as mainframe terminals Nevada Fortran is bound to notch up substantial sales — and deservedly so. ■

Product: Nevada Fortran

Price: £26.70

Supplier: Software Technology, 18D High Street North, Doncaster DN6 1AT. Tel: 0582 829687

Times in seconds to the nearest half second — except in the case of the VAX in bench mark 3. Compile time for the VAX includes link time.
(a) — Physical disc. (b) — ram disc — drive M.

	Nevada Fortran on the PCW		Fortran on a VAX 11/780		Turbo Pascal on the PCW	
	(a)	(b)			(a)	(b)
Bench mark 1. Bubble sort 100 integers sorted into ascending then descending order, four passes						
Compile time	33	11	4.5	1	1	
Run time	5	5	1.5	2	2	
Bench mark 2. Prime sieve Sieve all prime numbers up to 2000						
Compile time	25	9	5	1	1	
Run time	22	22	0.5	0.5	0.5	
Bench mark 3. Multiplication Multiply two six-figure numbers 10,000 times						
Compile and run time	58	58	0.05	21	21	

Figure 1: Bench mark timings

```

Bench mark sieve

C THIS PROGRAM IS USUALLY RUN FOR ALL
C PRIME NUMBERS LESS THAN 2000. BECAUSE
C OF MEMORY RESTRICTIONS IN THE
C COMPILER THIS NUMBER IS REDUCED HERE
C TO 2000
C
C
LOGICAL PRIME
COMMON WP, PRIME(2000)
WRITE (*,*)
CALL OPEN (UNIT, 'COM')
WP=2000
WRITE (*,*)
101 FORMAT (' STARTED WP')
DO 1 1=1, WP
CALL sieve
1 CONTINUE
WRITE (UNIT,102)
102 FORMAT (' FIN WP')
CALL EXIT
END

SUBROUTINE sieve
INTEGER MARRAY
LOGICAL PRIME
COMMON WP, PRIME(2000)
DO 1 1=1, WP
PRIME(1)=.TRUE.
CONTINUE
MARRAY = WP - 1
DO 2 1=2, MARRAY
IF 1, NOT PRIME(1) GO TO 2
101 1=1+1
DO 3 1=1+1, WP, 1
PRIME(1)=.FALSE.
CONTINUE
CONTINUE
RETURN
END

A method of testing the compiler

CALL OPEN (4, 'COM')
1 = 2
WRITE (6,101)
CALL CHRT (2)
1 = 3
WRITE (6,101)
STOP

101 FORMAT (' 1',10)
END

SUBROUTINE CHRT (I)
1 = 5
RETURN
END

```

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Dog Duck Cars
Guessing
Hangman
Maths Mixer
Pins
Old Man Out
Polynomials
Towers of Hanoi



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OLD MAN OUT

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CIRCLE

THE CPC484 has a few rather simple graphics commands which Amstrad greatly improved when they brought out the CPC664 and 6128. However there is still one command they might have included - a circle routine.

Now you can draw circles with ease on any CPC with the program presented here. When run it sets up a new RSK called, as you've probably guessed, CIRCLE.

It requires three parameters. The first is the X radius, the second the Y radius and lastly the pen to draw it in.

It's actually a bit more powerful than a simple circle routine since both X and Y are given. If X and Y are the same you'll get a circle. However if they are different you'll get an ellipse.

To use it MOVE to wherever you want the centre to be and CIRCLE to draw the circle or ellipse. For instance, to draw a circle in the centre of the screen simply enter:

```
MOVE 320,320
CIRCLE,128,128
```

Due to the poor pixel resolution in Mode D you won't get perfect circles if the radius is very small. The most accurate is the H-res Mode 2.

The usual method of drawing circles is used where x -radius * COS(angle) and y -radius * SIN(angle) with angle running from 0 to 360. Since SIN and COS are very difficult in machine code I've cheated and used a sly trick to avoid them.

At the end of the code are two tables - one of all the SIN values and one of all the COS values that are required multiplied by 64.

So SIN(20) instead of being 0.3420201433 becomes 22, or near enough as makes no difference. Negative numbers are marked by having bit 7 set.

The circle routine uses integer maths only and ends up with coordinates that are 64 times too big. It's a simple matter to divide by 64 to obtain the correct coordinates when the points are actually plotted. ■

By
**ROLAND
WADDILOVE**

```
10 RSK Circle
20 RSK By R.A.Waddilove
30 RSK 1:Computing with the fastest
40 PRINT "CIRCLE,x,y,pen"
50 MEMORY 10000
60 address=0000
70 FOR j=1 TO 24
80 sum=0:RND=0:total=0:check=0
90 FOR i=1 TO 25:STEP 2
100 byte=RND*(%*%+10000:),20
110 FOR address,byte
120 sum=sum+byte:total=total+sum
130 NEXT i
140 IF sum>VVAL(%*%+check):THEN FOR i
150 "Error in line ",(i+1):GOTO 200
160 NEXT i
170 CALL 64000
180 DATA 30880:70832:301488:1148,344
190 DATA 21880:1328:181488:1348,354
200 DATA 43492:43432:38800:70832,434
210 DATA 60832:60832:308411288,376
```

```
220 DATA 81008:8208:68804:3876,432
230 DATA 8048:10048:68832:308411288,358
240 DATA 89232:88800:1328492,432
250 DATA 6248:1328:68832:308411288,376
260 DATA 48832:6448:1328:68832,434
270 DATA 741888:70832:308411288,400
280 DATA 70880:68832:308411288,376
290 DATA 4448:30880:70832:308411288,358
300 DATA 8241888:70832:13284,376
310 DATA 8880:70832:68832:308411288,432
320 DATA 68832:68832:308411288,358
330 DATA 68832:68832:308411288,376
340 DATA 3232:1328:68832:308411288,354
350 DATA 1824:70832:1328:68832,388
360 DATA 70848:68832:1328:68832,488
370 DATA 48832:68832:308411288,376
380 DATA 8880:70832:68832:308411288,132
390 DATA 48832:308411288:1488:376,358
400 DATA 88832:70848:68832:308411288,432
```

3

D VECTOR graphics have been used in several popular Amstrad games — *Elite*, *Starion* and *Starstrike* to name but a few. Unfortunately, to achieve best effects they have to be written in machine code, involving some very advanced mathematics.

However, it is possible to demonstrate the principles of 3D graphics on which these more complicated programs are based, using a Basic program. Program 1, for instance, rotates and moves a 3D cube on the screen.

The first concept you must get to grips with is 3D coordinates and unless you've forgotten everything you were taught at school, you should know that a point on a graph can be identified by its two coordinates. These are usually called X (horizontal) and Y (vertical).

If you look at Figure 1 you'll see that point A is at (3,2) because it is 3 units to the right of, and two units above, the origin at (0,0). (3,2) can also be written as X=3 and Y=2.

Point B is at (-2,1), so X=-2 and Y=1. Notice that X is negative because it is to the left of the origin. Similarly, Y would be negative for a



Figure 1: 2D Coordinates



Figure 2: 3D Coordinates

Coordinate your efforts

NIGEL SHARP examines the potential for 3D graphic effects from Basic programs

point below the origin.

To express this in three dimensions you have the same X and Y coordinates, with the addition of a Z coordinate to indicate how far in front or behind the origin the point is.

In Figure 2, for instance, point C is at (2,1,3). X=2 because it is 2 units to the right of the origin, Y=1 because it is 1 unit above, and Z=3 because it is 3 units in front.

Before the computer can actually draw anything, we must define the object to be drawn, in terms of numbers. As an example how to do this, we will define a cube.

First we must allocate a reference number to each point and line on the object, as shown in Figure 3. The next step is to work out the 3D coordinates of the object. Figure 4 shows you the sort of thing I mean.

In Program 1 the data to describe

the object is held in two variables, and two arrays. The number of points and lines are held in the variable *np* and *nl* respectively. The array *c*, dimensioned as *c(3,np)* holds the X, Y, and Z coordinates of each point. For example *c(1,6)* is the X coordinate of point 6. The 1 means X, 2 would mean Y, and a 3, Z.

The array *l*, dimensioned as *l(2,nl)*, holds the reference numbers of the two points which the line runs between. Figure 5 shows the values of *nl*, *np*, *c*, and *l* for a cube (examples are underlined). This information has been incorporated in DATA between lines 6000 and 6090, and is READ by the routine at line 6000.

Now let's move on to the drawing routine.

If you take a look at Figure 6 you'll see that the eye is at the origin — where the X, Y, and Z axes cross. The

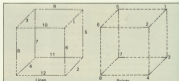


Figure 3: Reference numbers for lines and points



Figure V: The object's 3D coordinates

X axis is not shown as it runs into and out of the diagram through the eye.

The screen is in front of the eye, with the Z axis running through its centre. This means that we must set the graphics origin to the screen centre. We achieve this in line 210 with the command ORIGIN 300,200.

Suppose we wish to show the point P on the screen. We draw a line from P to the eye, and where it crosses the screen is where we must plot the point Q in Figure VI. The equations to find the screen coordinates QS and YS of a point in space with 3D coordinates X, Y, Z, are:

$$QS = (X/Z) * M \\ YS = (Y/Z) * M$$

The units used to describe the object are very large compared with the size of screen pixels. The multiplication by M at the end of the equations counteracts this (M is the magnification - a constant found by trial and error, usually about 1000).

In our example, both the cube and the eye are at the origin. This is a problem - we will be seeing the cube from inside. We get around this by adding a value (d) is used in the program) to the Z coordinate when

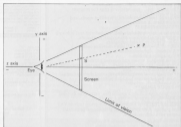


Figure VI: The geometry of plotting a point on screen

we draw each point. This has the effect of pushing the cube into the distance.

Incidentally, we could not have simply had the coordinates of the cube in the distance in the first place as the rotations, which we will be dealing with shortly, require the object to be centred around the origin.

Now you know the basic principles, we can look at the program itself. The routine at line 1000 goes through each line and collects the reference numbers of the points at its two ends, from the array I (lines 1020 and 1030). It then collects the 3D coordinates of these points from the array J (lines 1040 to 1060) and adds d to the Z coordinate to push them into the distance (lines 1100 and 1110).

These coordinates are then converted into screen locations (lines

1120 to 1160) and a line is drawn between them (lines 1160 and 1170). Then the next line is processed until all the lines have been drawn.

Now that we have written routines to define and draw the cube, we can actually draw it on the screen.

Unfortunately, it isn't very impressive (see Figure VII). What it needs is some movement. Using Basic it won't be very smooth, but we can do our best.

There are three ways the cube can be rotated - around the X, Y, or Z axis. Here are the formulas to rotate a point (OX,OY,OZ) to a new point (NX,NY,NZ). SN is the sine of the angle of rotation and CS is the cosine:

$$\begin{aligned} \text{Rotation around X axis} \\ NX=OX \\ NY=CS*OY-SN*OZ \\ NZ=SN*OY+CS*OZ \end{aligned}$$

$$\begin{aligned} \text{Rotation around Y axis} \\ NX=CS*OX-SN*OZ \\ NY=OY \\ NZ=SN*OX+CS*OZ \end{aligned}$$

$$\begin{aligned} \text{Rotation around Z axis} \\ NX=CS*OX-SN*OY \\ NY=SN*OX+CS*OY \\ NZ=OZ \end{aligned}$$

Forward and backward movements can be performed by simply increasing and decreasing d. The

$d = 12$ (1/2 inch) $sp = 8$ (8 pixels)		<table border="1"> <tr><td>1</td><td>1</td><td>2</td></tr> <tr><td>2</td><td>2</td><td>4</td></tr> <tr><td>3</td><td>3</td><td>8</td></tr> <tr><td>4</td><td>4</td><td>7</td></tr> <tr><td>5</td><td>5</td><td>1</td></tr> <tr><td>6</td><td>6</td><td>3</td></tr> <tr><td>7</td><td>7</td><td>5</td></tr> <tr><td>8</td><td>8</td><td>6</td></tr> <tr><td>9</td><td>9</td><td>8</td></tr> <tr><td>10</td><td>10</td><td>8</td></tr> <tr><td>11</td><td>11</td><td>7</td></tr> <tr><td>12</td><td>12</td><td>6</td></tr> </table>	1	1	2	2	2	4	3	3	8	4	4	7	5	5	1	6	6	3	7	7	5	8	8	6	9	9	8	10	10	8	11	11	7	12	12	6																		
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X	Y	Z																																																						
1	+1	+1																																																						
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7	+1	+1																																																						
8	-1	-1																																																						

Figure VII: Example array contents for a cube



Figure 98: The drawn cube before rotation

From Page 65

required for the three rotations are at lines 2000, 3000, and 4000 respectively. Lines 200 to 370 form the main loop of the program and perform the appropriate rotations as various



Figure 99: The rotated cube

keys are pressed. The cursor keys, and keys 7 and 9, are for the rotations, while Copy and B move the object forward and backward. You can see the results of a rotation in Figure 99.

If you are in an adventurous mood

after typing in the program, try changing lines 6000 onwards to define some other object. The first two values in line 6010 refer to x and m , respectively. You'll probably get away without changing these. If the object is too small, decrease x and/or increase m . If it is too large, increase x and/or decrease m . It is best to keep x above 3 or so.

The next two values (line 6020) are the number of points and lines respectively. Following these are the coordinates (grouped into threes for readability) and the line data (grouped in twos).

Armed with these principles and using a little thought and patience, you should be able to draw and rotate a variety of interesting shapes. ■

```

100 REM *****
110 REM *      *
120 REM * 3D GRAPHICS *
130 REM *      *
140 REM *****
150 REM
160 REM by Nigel Sharp
170 REM (c)Computing with the Astral
180 REM
190 MODE 1
210 ORIGIN 0,0,0
220 GO
230 GOSUB 5000
240 CLS
250 GOSUB 1000
260 SP=0:ST=0
270 IF SP=7 THEN ST
280 SP=SP+1
290 IF SP=24 THEN SP=10:GOTO 2000
300 IF SP=24 THEN SP=10:GOTO 3000
310 IF SP=24 THEN SP=10:GOTO 4000
320 IF SP=24 THEN SP=10:GOTO 5000
330 IF SP=24 THEN SP=10:GOTO 6000
340 IF SP=24 THEN SP=10:GOTO 7000
350 IF SP=24 THEN SP=10:GOTO 8000
360 IF SP=24 THEN SP=10:GOTO 9000
370 GOTO 240
3800 REM draw object
3900 FOR pt=1 TO 6
4000  p1=C1,pt
4100  p2=C2,pt
4200  x1=C1,pt
4300  y1=C2,pt
4400  z1=C3,pt
4500  x2=C1,pt+1
4600  y2=C2,pt+1
4700  z2=C3,pt+1
4800  x=C1,pt+1
4900  y=C2,pt+1
5000  z=C3,pt+1
5100  x=C1,pt+1
5200  y=C2,pt+1
5300  z=C3,pt+1
5400  x=C1,pt+1
5500  y=C2,pt+1
5600  z=C3,pt+1
5700  x=C1,pt+1
5800  y=C2,pt+1
5900  z=C3,pt+1
6000 REM Rotate object around I axis
6100  ax=0:axi=0
6200  ax=COS(axi)
6300  ay=SIN(axi)
6400  FOR pt=1 TO 6
6500  x=C1,pt
6600  y=C2,pt
6700  z=C3,pt
6800  x=x*ax-y*ay+z*ay
6900  y=x*ay+y*ax-z*ay
7000  z=z*ax+z*ay
7100  NEXT pt
7200 RETURN
7300 REM Rotate object around J axis
7400  ay=0:ayi=0
7500  ay=COS(ayi)
7600  az=SIN(ayi)
7700  FOR pt=1 TO 6
7800  x=C1,pt
7900  y=C2,pt
8000  z=C3,pt
8100  x=x*ay-z*ay
8200  y=x*ay+y*ax-z*ay
8300  z=z*ay+z*az
8400  NEXT pt
8500 RETURN
8600 REM Rotate object around K axis
8700  az=0:azi=0
8800  az=COS(azi)
8900  ax=SIN(azi)
9000  FOR pt=1 TO 6
9100  x=C1,pt
9200  y=C2,pt
9300  z=C3,pt
9400  x=x*az-y*az+z*az
9500  y=x*az+y*ax-z*az
9600  z=z*az+z*ax
9700  NEXT pt
9800 RETURN
9900 REM Data for cube
10000 DATA 0,1000
10100 DATA 0,12
10200 DATA -1,-1,-1, 1,-1,-1
10300 DATA -1,-1,-1, 1,-1,-1
10400 DATA -1,-1,-1, -1,-1,-1
10500 DATA -1,-1,-1, -1,-1,-1
10600 DATA 1,2, 2,4, 5,8, 7,8
10700 DATA 1,2, 2,4, 5,7, 4,8
10800 DATA 1,2, 2,4, 5,7, 4,8

```


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THERE are only two reasons I can think of for buying a PCW 8256 rather than its more developed brother, the 8812. One, of course, is the price. The other is being able to choose your second disc drive.

Inside the 8256 are power and data lines in an unused ribbon cable, ready to be linked to the official Amstrad second drive. But in theory any drive can be connected, including ones not requiring over-priced 3in discs.

Box Ltd has produced two versions of a 5.25in drive which connects up directly to the unused cable. The 40 track version gives 350k of disc space, and the 80 track version 700k — in other words, storage at a fraction of the cost of 3in discs on a single drive 8256.

There is also the possibility of holding large data files on the same disc as the programs which access them. All that, and an interesting piece of file transfer software — about which more in a moment.

Installing the drive is simply a matter of removing the back of the 8256, snipping off a rib securing the spare cable and connecting the latter to the one supplied with the drive. The push-on connectors are painted, so there is no possibility of error.

Once installed the new cable fits snugly in the printer port and is long enough for the drive to sit next to the printer, but not to reach the left-hand side of the machine. I wish manufacturers of add-ons would not skimp on cables because of Amstrad's over-cautious advice about keeping them short.

The drive itself is housed in a metal case measuring 9 x 8 x 2in and the colours match those of the 8256. Opening it up reveals that it is made by National Panasonic, and the year's full warranty offered by Box indicates how confident they are about its Japanese reliability.

However, like all suppliers of add-ons, Box disclaims responsibility



The Xeno software with PC-DOS, PC-Disk II and other software is a CPM file.

for any consequential damage to equipment — in effect a reminder about invalidating your guarantee merely by removing the back of your PCW.

I have no complaints about the efficiency of the drive, though it is possibly a little slower and noisier than most — the latter exacerbated by the fact that it whirrs away even when only drive A is active.

These are a small price to pay for the advantages it offers. All software packages — including LogoScript, for once — and CPM utilities can access it freely. You can't boot-up from the new drive B, but you can read from and write to 5.25in discs (just as you would with the 3in variety once they have been formatted with the utility supplied).

All that would be good enough in itself, but there's also the software. One of Box's target markets is 8256 owners who wish for a variety of reasons to have file compatibility with the industry-standard IBM PC.

Box therefore supplies a smart package called Xeno which transfers files both ways between an Amstrad CPM Plus disc or files on drive B, and an IBM PC-DOS or compatible

MS-DOS disc in drive B.

The program will also rename or delete files on either type of disc and — more importantly — convert an Amstrad format 5.25in disc to PC-DOS format, thus allowing you to create PC-DOS files without having an IBM PC or compatible to hand.

A good deal of thought has gone into Xeno, which does not suffer from the shortcomings of some file transfer programs. For a start it copes as happily with binary files as with ASCII files, and completely maintains their integrity.

For example a WordStar file will be copied with all print and formatting instructions intact. What is more, a partly filled final record in a CPM file will be padded out with end-of-file markers in order to preserve the exact original file size.

The program has only two limitations worthy of mention — it will not handle random access files unless they have been created with so-called zero fill, and it will not recognise either CPM User groups or PC-DOS sub-directories.

But these are hardly major

GABRIEL JACOBS reviews the Box add-on disc drive for the PCW8256 and its accompanying Xeno software

From Page 77

considerations. In fact, as is pointed out in the Xerox documentation, if you do not understand the restrictions they will probably never affect you.

Those who are affected by them will know that it is possible to fill the gaps in a copy of a random access file, and that it is hardly an imposition to keep all CP/M files temporarily in the default user group Q and PC-DOS files in the root directory.

It is worth noting however that Xerox-style groups are simply CP/M groups Q to Z, with B used for files in limbo. Should you wish to reave files to group Q when working outside Xerox-style you should use the G option in XFD.

The Xerox user-interface is as clear as it could be, and the instructions supplied on disc are hardly necessary. It is fully error-trapped with appropriate confirmation messages, and has even been configured to accept ViewStar-like cursor codes if the

keys have previously been set up that way.

Date and time are requested when the program is loaded, and PC-DOS files are automatically stamped. However, there is no real-time clock, so the files will bear the stamps you have entered no matter how long the copying session.

Once beyond date and time the screen divides into three, with CP/M files on one side, PC-DOS files on the other — both in alphabetical order — and a command menu in the middle.

The screen will accept 25 files on each side, but if this number is exceeded you can scroll horizontally, with a fast-scroll mode for very large directories. Files are highlighted with a bar and then tagged for copying. As many files as you like can be transferred in a single operation.

After a transfer has been initiated you simply watch it happen. The only exception is when copying files larger than the space available on drives A or M. In this case you can use drive B

for both CP/M and PC-DOS, and swap disc when prompted.

I would imagine that a substantial market already exists for the kind of file transfer medium offered by Xerox — one which could well increase when the Amstrad IBM PC clone gets a firm foothold. But even if you have no use for such a package the drive is well worth considering without it.

Larger, and particularly, cheaper data storage are obviously attractive propositions to most 80286 users. The Box drive offers both in roughly the same price range as the official Amstrad second drive. ■

Price: £225 (the drive for the PC/80286, plus Xerox CP/M Plus/PC-DOS file transfer software).

Price: 40 (hard drive £177.00 80 track drive £207.25. Xerox £23.00 if purchased with the drive, or £35 if purchased separately).

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STC Prize letter

HERE are some slight modifications I have made to John Mason's useful Word Count program from the September 1985 issue of Computing with the Amstrad.

I decided to alter it in order to provide a running word count as found in several word processors I have used.

Ask the following to the end of line 210:

```
PRINT WORD+COUNT;PRINT COUNT;  
GOTO 200
```

and the following to the end of line 2160:

```
PRINT COUNT;PRINT WORD+  
COUNT;GOTO
```

This will provide a running word count in the top right-hand corner of the screen.

The position can be varied by altering the figures 32 and 508 in line 210 - see page 58 of the CAPRI - D printing system manual supplied with the PCM.

Also by adding a semicolon to the end of line 590 the "Words ... being counted" message will appear on the top line of the screen.

The modification does slow things down a little.

I found a count of the RAMDISK file from the LoadScript file in one minute 42 seconds without the changes, and one minute 59 seconds with them - 17 seconds on a 5Ks file when converting to ASCII.

By the way I found that the feature to hide the program files from the selection list did not work.

This is because the FINDS function always returns a 12 character string.

The filenames contained within the brackets in line 230 must be changed to our own words in the form BASIC.COM and MODULV.J45 in order for the function to work.

— Richard Soper, Bechill-on-Sun, East Sussex.
 ■ We're sure our readers will find this extra facility useful. Regarding the FINDS function

you're quite right.

Sometimes during processing the spaces were stripped out from the filenames and this will have the effect you describe. Congratulations on being so observant.

Canon fodder

I've been doing a little in the August 1986 issue of Computing with the Amstrad reader but your instructions to work with my Canon 1080A.

In the second column of the listing, immediately before:

```
LD A,00H:MOV B,00H
```

insert:

```
LD B,00H:MOV
```

to effect a carriage return - *Wes Christian, Macclesfield.*

Still counting

THANKS for the basic program in your September 1985 issue that counts the number of words in a LoadScript document.

Here is an alternative method using LoadScript itself to count the words. Although extremely slow it does the job and can be left running on its

own without further input.

First copy your document to drive B:, so that access is faster and you do not accidentally corrupt your original document.

Now edit the header of this copy and set the number of lines in the body of the page to 50 - this is to make counting easier.

Make sure the page number starts at 1. Use the Exchange key to change all carriage return characters in the document to a space and get rid of any codes that force a page break.

Now for the all important Exchange command. Change all single spaces to a Asterisk. You will see LoadScript writing each word - together with any punctuation - as a new line.

When it has finished position the cursor on the last line containing a word and make a note of the page and the number that the cursor is on.

The number of words equals out as (PAGE NO. - 1) * 50 + LINE NO.

Whatever method of word counting is used I recommend keeping a record of the number of words, together with the date and time, on line 2 of the LoadScript identity text option.

If you then make a minor amendment to the document you can repeat this total and avoid a recount. — Peter

ALL programs printed in this magazine are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on rare occasions when mistakes occur corrections are published as a matter of urgency. Should you encounter error messages when you type in a pro-

gram, they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any reader found necessary will only appear in the mail pages.

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■ It would be amazing what human ingenuity can achieve - no wonder we got to the moon.

Still it may be better to wait for a proper solution, which could well be quicker than counting an 80k file.

Tape files to disc

THANKS for your reply to my query regarding Vardamp from the August issue of Computing with the Amstrad.

I was suffering from the SYMBOL ATTCM syndrome and Vardamp is now back in business.

Could I ask your advice once again?

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Rom routines

I WANT to access the following rom routines on the 0128 - Wait key, Read key, Test key, Get key, rom wait, Rom screen and Printer routines.

Where are they located and where are the system variables located. Also can I access them?

I use a ZMP1 and require a screen dump program for all modes. Can you help me? - J. Jacques, Didsbury, Manchester.

All the routines you require are fully documented in The Complete CPC664 Operating System Firmware Specifications.

This lists all the standard jump block entries which all CPC Amstrads use, giving the entry conditions required and the state of the registers and flags on exit.

Can any of our readers help with a ZMP1 screen dump?

500 Prize letter

Problem wrapped up

WHILE writing an adventure game I came across the need to find an easy way of preventing word wrapping round on to the next line of the display.

My solution was to write a program to display the test word by word, checking

beforehand whether each word would fit on to the line or not.

The following is the finished subroutine complete with a demonstration of how to use it.

```

10 ROM String Pointer
20 ROM by Stephen Harold.
30 END
40 REM**This test shows how
the word wrap subroutine is
used**
50 SCREEN 000
60 END
70 :
8000 ROM -----
8010 @=0:R@=0:R@**@R**@:
90
9010 FOR I=1 TO LEN(R@)+1
I
9020 @=@+@+@
9030 IF @=CHR(14) THEN GO
SUB 1110
9040 IF @=CHR(13) THEN GO
SUB 1110
9050 @=CHR(10:R@,I)
9060 NEXT I
9070 PRINT @,@
9080 @=@+@+@
9090 RETURN
9100 REM -----
9120 IF @LEN(R@)@ THEN P
RINT @,@,@,@,@,@ PRINT @,
@,@,@,@,@,@
9130 @=@,@,@,@
9140 @=@+@+@
9150 RETURN
    
```

You must define the string you want to be printed as @, and the screen number in @

and then call the subroutine. The variable @ is the maximum number of characters per line which must fit changed for each block. - Stephen D. Wardell, Hemington, Cleveland.

Trying again

IN the October issue of Computing with the Amstrad you printed a letter of mine together with a short machine code listing.

Unfortunately you have managed to omit the label "again" from my listing. It should, of course, be present at the instruction 'D' a, (X+D)'. - D. H. G. Law, Malvern, Glos.

Sorry about the slip, the correct listing should be:

```

org 1676
start defb 'DATA'
defb 13
defb 18
defb 7
finch
next line gets length
I I,1,1,start-start
I I,start
again I I,1,I,I
call title
inc I
djr again
ret
end
    
```

New routine

I HAVE discovered a firmware routine which is not documented in the 48K firmware code.

It is the string input routine as used by Basic and the entry in the jump table after the JUMPDEF (48037).

The address of the routine is at 8403A.

Entry conditions: A contains address of 255 byte buffer.

Exit conditions: If user pressed Esc, Carry is on, A contains the last character typed and H contains the buffer address.

If user pressed Escape,

Carry is false, A contains the last character typed and H contains the buffer address.

All other registers are preserved. This routine is useful as the Del, Cr and cursor keys perform their control operations.

If there are any characters in the buffer before the routine is called they will be printed out, unless the first character is a null. This may prove useful for editing purposes. - Matthew Weston, Malvern, Worcester.

Binary files

HOW do I determine the length of binary files for my own programs?

A case in point is A.B. Street's letter in your September issue in which he queried how to convert letters generated by the Pascal program into Ascii files to make them acceptable to another word processor.

In the short program you gave to solve the problem you ask for the length of the file. - A. Edwards, Donnescourt, Cardiff.

There's no simple way of determining the length of a binary file.

You can get a rough idea by cataloguing the disc using the approximate length of each file is printed following the name.

To find the exact length you'll have to resort to machine code. The following routine will find the length of the file FREEDUM and store it at 84000/84001:

```

000 0000
L3 8,0,0,0,0,0,0,0
L3 8,0,0,0,0
L3 8,0,0,0,0
CALL 06C70 JOVERN
L3 0,0,0,0,0,0,0,0 Jlength
IF 06C70
:06C70
DEFB "FREDUM"
:06C00
END
    
```


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Knife86 We are delighted to announce the release of our first power utility for the PC1512. Knife86 is a utility program designed to allow you to recover damaged and deleted data from your disc. Tools available include UNDEL (undelete deleted files), SHOWSLAP, PATCHPAT, KNIFEM plus lots more (including a 78 page manual printed full of technical detail on MMSX and CPM88 discs).

All for only £29.95

HiSoft TurboBASIC

As long as there is a fast and powerful BASIC compiler for Amstrad BASIC HiSoft TurboBASIC is a top compiler of Locomotive BASIC 1.0 on the Amstrad CPC series of computers turning your BASIC statements into machine code programs to be executed whenever you like.

TurboBASIC certainly is fast, just look at the PCW benchmark timings using interpreted BASIC and compiled TurboBASIC:

Program	INT	TUR	INT	TUR	INT	TUR	INT	TUR
Amstrad	1:00	0:15	1:17	0:22	1:34	0:24	1:52	0:28
PCW	1:10	0:18	1:12	0:22	1:26	0:24	1:38	0:28
Adapted to Amstrad	1:10	0:18	1:12	0:22	1:26	0:24	1:38	0:28

Also, the BYTE Slave benchmark, which is an example of a whole program and not a somewhat artificial benchmark, executes in 1.56 seconds when compiled with TurboBASIC as compared with 123 seconds when interpreted with BASIC 1.0, a speed increase of 49!

TurboBASIC is an integer-only compiler which means that it only compiles whole-number arithmetic, not floating point. This allows compiled programs to run with extra speed and, in conjunction with the Amstrad graphics (all of which are supported by TurboBASIC) some pretty amazing games can be written in BASIC instead of machine code. We supply an example space invaders game (too with TurboBASIC) so you can see for yourself the dramatic speed increase.

HiSoft TurboBASIC £14.95 tps, £19.95 disc

WRITE HAND MAN New Version!

This fabulous program sits in the background of your Amstrad CPM computer ready to spring into action at the press of a key and it doesn't matter what you were doing before, Write Hand Man is always at your beck-and-call.

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We have now produced a brand-new version of Write Hand Man with many improvements and extra features some of which are:

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- improved graphics on the PCW8256/8512 e.g. calculator shown above
- full year calendar up to the year 1998 with today's date shown (CPM Plus version)
- full screen refresh (even of graphics!) when leaving WHM on PCW8256/8512
- all applications make full use of the PCW8256/8512 cursor and function keys

• and still only £29.95

Write Hand Man works alongside any CPM 2 or CPM 85 program on all Amstrads and comes complete with a manual describing how to add your own applications. Screen refresh works under CPM Plus only. Order by post or phone from HiSoft.

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November 1986 Vol. 7 No. 5

BUSINESS COMPUTING

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Landscape and
Rotate utilities
compared



**SIDEWAYS
SPREADSHEETS**

First Base reviewed

File transfers simplified

LocoScript problems solved

A LEADING market analyst has predicted that the unveiling of the Amstrad clone will be the most significant event since IBM launched its PC back in 1981.

Sirén Pearce of IDC forecasts that the new machine will capture 40 per cent of the PC market in the UK next year. And this will rival IBM itself.

"I believe that Amstrad can meet its sales targets—200,000 in the first 12 months," he said.

However, Pearce believes that this figure will not be achieved solely on the home front.

"The majority of sales must come from outside the UK which has a much higher penetration of PCs than other countries in Europe," said Pearce.

"Australia will also be an important market. But the sales potential in the US is limited due to the much higher level of competition."

The computer industry watcher went on to warn that Amstrad's arrival in the PC field will eventually result in a major shake-out.

"Survivors will be those who are able to compete on price/performance terms with Amstrad, who will be few", insisted Pearce.

"Although IBM, Olivetti, Compaq and other current market leaders will lose market share, those small vendors who entered the compatibles market earlier this year will be the first fatalities."

Pearce also warned that if firms like Dixons continue to dominate the market thanks to its strong links with

Amstrad tipped to grab 40% of PC market

Amstrad, 30 per cent of the 1,700 existing UK dealers could go to the wall.

One of the major benefits of Amstrad becoming number one in the PC market, said Pearce, will be a dramatic fall in the price of software.

"Users can look forward to the prices of the standard packages of the spreadsheet, WP and database variety falling by more than 50 per cent in the next few months", he claims.

Applications development

INTUITIVE Solution, the forms processing system from Intuitive Systems, is now available for the PC1512. The PC's mouse, graphics screen and 512k of memory make it ideal for running this full applications development environment, believes Intuitive Systems' marketing manager Jim Sutherland.

Consisting of four discs and a

manual it is priced at £720 for single users and £1440 for up to eight users on a network.

To prove its faith in the product the company has produced an accounting package using Intuitive Solutions.

Aimed at the first time user Intuitive Cash Book Accounting System features permanent display menus, on-screen inquiries, integral windows, cut and paste, and word processing facilities.

There is a realistic on-screen representation of all the conventional accounting books. Price, including a three month hotline service, is £89.

CAD package

A COMPUTER aided design package from GrafSales has been launched for both the PCW range and the PC clone. Grafpad 3, using an enhanced version of the Grafpad 2 graphics tablet, is aimed at the professional market.

The software features hi-res graphics and the Grafpad tablet can be configured as an alternative function keyboard with the help of a 200 selection tablet overlay.

Full CAD functions such as arc drawing, font symbols, zooming and printer/plotter driving are present. The PCW dot matrix printer can be used for hi-res graphics dumps. Price for both PCW and PC is £149.90.

A VERSION of the PCW8256 Transporter from Villa Case has been produced for the PC1512.

It consists of two cases, one for the monitor and the other for the CPU and keyboard.

Price: £27.86.

Help with estimates

WITH the novice business user in mind, Comix Software has produced two new packages for the PCW.

Product Costing keeps track of raw material and labour costs and gives a report of the latest cost for each product.

The user is given full control of his selling prices and can apply mark-ups to suit his market needs.

Automatic percentage mark-ups can be applied to calculated costs and the profit report is given both as an amount and percentage of the manufactured item. Price: £49.95.

Job Estimating is for contacting organisations whose cost to complete is vital at every stage.

The package provides printed estimates and quotations for each particular job. Labour rates and product costs can be varied as required.

A switch on one of the menu screens allows the estimating program to run in either management or customer mode. Price: £49.95.

Comix says Product Costing and Job Estimating will also be available for the Amstrad PC1512 soon.

The Amstrad CPM Plus

by
David Powys-Lybbe
Andrew R. M. Clarke

Second Edition - 520 pages

Paperback ISBN 1 859610 05 1 £12.95

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Doc of software from book £14.95 + VAT

The most complete book on CPM PLUS for the Amstrad 8256, 8512 and 8128 computers by two leading authorities on CPM PLUS.

Includes a section on using CPM with chapters for the first time user, sections for the programmer with full details on the BIOS, DOS and OSX and chapters on languages and assemblers. It is both a book and a reference manual.

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Books for the PC

A LEADING software house has gone into print for the first time to mark the arrival of the Amstrad PC. Digital Research, the company whose DOS Plus and GEM are bundled with the 1012, has launched three reference books in association with Glentop Publishers.

The new titles are: *Using DOS Plus on the Amstrad PC*, by Stephen Moxie, £9.95 in paperback and £12.95 casebound. *Using GEM on the Amstrad PC* by Kathy Lang, costs £12.95 paperback and £15.95 casebound. *Business Presentation Graphics on the Amstrad PC*, also by Kathy Lang and with a price tag of £12.95 in paperback or £15.95 casebound.

..and budget programs

A BUDGET series of business products for first-time users has been released by Comsoft for the PC1012.

The five programs are based on its current IBM professional range, but Comsoft stresses they have been rewritten to make them more user-friendly and suitable for the PC.

Budget Delta 4, a revised keeping applications system for small businesses, has a capacity of 1,000 header/master records. Price: £99.95.

Budget Domino, a computer

training and presentation package, is suitable for education or business use. It has a maximum 65 pages and costs £99.95.

Budget Delta Graph enables the user to create a wide range of graphs in both colour and monochrome.

Input is directly into the keyboard and information can be collected from other databases.

The package features matrix report action, which allows grid analysis of information, such as breaking up sales into month by month figures. Price: £89.95.

Bookwriter is an integrated accounts package suitable for businesses that have previously kept their books manually.

It incorporates sales packages, stock records, invoicing and a fully integrated nominal ledger.

Graphically represented accounts ledgers open like real books and the software is function key driven. Price: £199.99.

1-Up, a disc-based computer calculator, may be used as a hand-held calculator or as a tillroll.

A third option allows it to be used as a programmable calculator with complex calculations stored in memory via a Basic-like language. Price: £49.95.

Range extended

THREE new products have been added to the SageSoft PC business range.

Sage PC Planner is a Lotus 1-2-3 compatible spreadsheet. It is de-

signed to produce high quality business graphics which can be printed or plotted in up to eight colours. Price: £99.

Sage DeskSet, a desktop package for the PC, offers a "pop-up anything" facility which the company claims is unique.

This partitions the memory, allowing the user to move from one application to another and then instantly back to the original screen.

With the cut and paste facility data transfer requires only six keystrokes.

Also included are a calendar, alarm clock, unlimited scheduler, financial, statistical and ordinary calculators each with 10 memory locations, and a window to DOS. Price: £99.

Sage PC Write, a word processor with a 45,000 word spelling checker, has a split screen facility enabling two screens to be edited at once. Price: £99.

Training attraction

FANCY a weekend away in a luxury hotel learning all about the Amstrad business machines without your wife noticing? Well it's now possible thanks to an innovative scheme run by Great Training in conjunction with The Mease Group.

The company is offering free accommodation for wives and children as part of the package costing less than £300. The idea is that while hubby is getting to grips with the intricacies of the PCWs or the new PC, the rest of the family can enjoy a mini break away from home.

And that's the reason the hotels selected sport such refinements as health clubs and jacuzzis and are convenient for sightseeing.

Not that Amstrad business users are going to have too much free time themselves, at least during the day. According to Ian James, author of *The Amstrad PC's: DOS/6/6612 - More Than Just A Wordprocessor*, and the course lecturer, they will be there to learn.

"We would like to stress that it is only the family who will have a holiday", he says. "but the course member should find the weekend training stimulating to say the least".

WHAT IS SANDPIPER?

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A professional, well-established company producing software designed to meet the commercial requirements of businesses, large and small. Produced to cater for the administrative needs of a busy office, the software is well thought out, practical and simple to use.

All products are available to run on IBM PC compatible machines including the Amstrad PC 1612, and the Amstrad PCW Series. Tested in the market place, Sandpiper Software has proved, by demand, to be one of the most popular software ranges available, backed by full customer telephone support if required.

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File Manager — a comprehensive, fully relational, interactive and programmable multiple package designed to cater for individual business needs, and yet it is so simple to use. Starting from simple systems and then expanding upwards, files can be selected, calculations made, information returned to any file, information updated and reports produced. No other database package offers so much for so little.

SANDPIPER IS..

Accounts — a simplified integrated accounting system for which each transaction need only to be entered once as all relevant ledger postings happen automatically. Sandpiper Accounts produces personalized invoices, statements and remittances. Designed for inexperienced users, this package has a large file capacity for Sales, Purchase, Nominal ledgers, creditbook, daybook, VAT returns and labels.

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Payroll — a simplified integrated payroll system designed to be fully compliant with all Tax/National Insurance guidelines. The system is 285 compatible, caters for additions and deductions, bonus and overtime rates, pension schemes and holiday pay.

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Sandpiper Accounts £149.95 inc VAT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Spread yourself on the PCW

GABRIEL JACOBS compares two programs that give a printer a broad view of spreadsheets

LIKE most of its counterparts, the PCW printer will take paper up to a little over 10 inches wide, which is sometimes too narrow for tabular applications, even with condensed typefaces.

The limitation is particularly applicable to spreadsheets, which tend to produce tables as horizontally orientated rectangles (more columns than rows), which have then to be printed on vertically orientated sheets of paper.

Some spreadsheets will automatically split a printout widthways — when the right-hand edge of the paper is reached, any remaining columns are temporarily stored until the last line of the table has been completed, and they are then printed separately underneath.

This is better than nothing, but it makes the complete table difficult to take in at a glance.

A more sophisticated solution to the problem first appeared as a software add-on for the IBM PC, and is now an integral part of some of the most up-to-date spreadsheets.

The approach is to turn the printer output round by 90 degrees so that printing is carried out sideways. This means that the maximum number of printable columns per page depends on the length of the paper rather than on its width. Thus with continuous stationery there is virtually no "width" limit.

As far as I am aware, no spread-

sheet available for Amstrad machines has this feature built-in, but Rotate and Landscape are two programs designed to achieve the same ends — they will take any Ascii file and print it out in rotated form.

As well as most spreadsheets, many databases and word processors (including LaserScript) have a facility for converting files to Ascii format, so the programs can be used for a variety

of applications, from producing tabular lists to fitting text most appropriately round diagrams (though a good deal of lateral thinking will be necessary before attempting that particular operation).

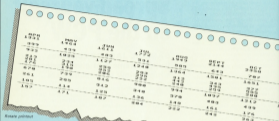
Rotate is more expensive than Landscape, but has a far wider range of facilities, accessed via a series of

Landscape
with menu



	A	B	C	D	E	F	G	H	I
SALES	100	200	300	400	500	600	700	800	900
EXPENSES	50	100	150	200	250	300	350	400	450
TOTALS	50	100	150	200	250	300	350	400	450

Landscape output



Rotare printer

From Page 7

menus and sub-menus. Apart from basic features such as a choice of single-sheet or continuous-stationery, and an option to view disc directories, the program offers fine-grained control over character spacing and line spacing, a choice of four different typefaces each in single or double sized characters, and an option to print a file in conventional east-west fashion for mixing tables and normal text without leaving the program.

Maximum lines and columns are automatically adjusted to fit the typeface selected.

Landscape runs under Mailord Basic, and is therefore significantly slower in its reactions than the compiled Rotare, though it actually prints marginally faster.

Arguably it has two advantages over Rotare. The first is that it offers very compact print on a matrix of up to 96 x 256 characters (almost 50 per cent more "lines" than Rotare).

The second - and some will not see this as an advantage - is that it is simplicity itself to use. There is no complicated tree of sub-menus, just a single list of options (condensed or standard print, continuous or single-sheet paper, and so on).

There is no choice of printing east-west rather than north-south, nor any selection of typeface fonts.

All in all, whereas Rotare requires several stages of effort excellently



Rotare main menu

produced documentation, the Landscape screen is sufficient for even the most inexperienced user to manage without assistance, and very little is in fact given in the way of printed instructions.

Which then, is the better buy? Well, Rotare is more professionally produced, gives you greater flexibility, and you don't have the hassle of loading Basic.

On the other hand, many users will be less interested in pretty tables than in getting the maximum amount of data on a page, and doing it without a complex series of choices. In this case Landscape fits the bill.

System Build, which produces Landscape, is promising an upgraded



version which will incorporate user-defined typeface fonts and other goodies. That should bring it up to the complexity of Rotare and perhaps beyond, so it will then be even more difficult to decide.

Product: Rotare
Price: £24.95
Supplier: Lightroom, 2 Wilby Road, Warrimount, Canada MS 0P4, Tel: 01-748 202.

Product: Landscape
Price: £18.95
Supplier: System Build, 13, Market Place, Market Drayton, Shropshire, PV6 6BA, Tel: 0778 344366.

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As we've seen the Mini Office II package can take a lot of the drudgery out of handling figures and large amounts of data. However, it's fine to have all the numbers at your back and call but it's no use if you can't visualise what they mean.

Here's where the Mini Office II Graphics module comes in. It's designed to take data and replot it as a series of graphs or diagrams so the implications can be understood at a glance.

What does it do? It can be used in one of two ways. You can either enter the data to be graphed directly from the keyboard, or load it from a file created in another module.

In either case up to three separate groups of data can be handled simultaneously. Mini Office II refers to these groups as data sets, and requests into which the data is to be placed for treatment.

If later you wish to process further data you can either use the Clear data option found on the Graphics module menu and start again, or over-write a data set by entering or loading as necessary.

The problem for the novice is that if you are not careful you can end up with an attempt to compare data in one data set with unrelated data in another.

If you do wish to use more than one data set you must ensure the compatibility of each set.

Comparing September, October and November results is no problem,

Title	Data set		
	1	2	3
A. Cost	125	90	80
B. Cost	38	60	80
C. Cost	75	120	90
D. Cost	60	70	80
E. Cost	230	170	230
F. Cost	90	140	120
G. Cost	400	350	480
H. Cost	280	270	270
I. Cost	800	880	830
J. Cost	280	230	240

Figure 1: A sample data set

Graphics give the raw data real meaning

but be careful if you try to compare something such as the drug dosage of various medications used for different ailments.

A final note is that it is pointless to try and graph values which are widely different in size. A data set consisting of the values 10000, 1000, 100, 10, 1, .1, .01, .001, .0001 would be impossible to accommodate given the size and resolution of the CPC screen.

We'll start by entering the data from the keyboard - the easiest way to explain.

Place the Mini Office II disc in the drive, type RUN "OFFICE", select graphics then Edit data.

You will be asked at this stage into which data set the figures you will enter are to be placed. To keep it simple at this point, in response to the prompt:

Enter Data
Data set 1, 2 or 3?

The screen will present you with two columns, the first of which, Fieldname, is for a brief description. It is pointless making this too long since it may be truncated depending on the room available on screen.

Do not worry about this since you will have ample opportunity later for placing all the text you may need.

The second column is where the value is entered. At this stage it is filled with zeros, although if you had loaded data from a file the results would already be present.

Enter the data set 1 table as shown

in Figure 1. Use the cursor keys to move round the screen and the Delete key to correct any errors.

When you have finished press Escape and you will be returned to the Graphics menu. To protect the file immediately select Save data, to the prompt Are you Sure (Y/N)? reply Y, and to Data set 1, 2 or 3? reply 1. When you are requested for a filename, type GRAPHDAT1 or any other valid name then press Enter.

An important point to make at this stage is that you must choose data set 1, since this is the only one which currently has data.

Before going any further, repeat the Edit data followed by the Save data procedures described above to load up data sets 2 and 3.

Notice how Mini Office II helps you by supplying you with the positively used Fieldnames, thereby minimising the risk of the incompatibilities I mentioned earlier. Use the file names GRAPHDAT2 and GRAPHDAT3 or any others you wish.

Having done this and returned to the Graphics menu, select Bar chart and you will be presented with the area over which your data set will be graphed. Down the right hand side you will see five sketches called icons. These represent from top to bottom:

- Single bar chart.
- Multiple bar charts laid out side by side.
- Multiple bar charts laid out stacked one above the other.

JO STORK continues his series on making the most of Mini Office II

From Page 11

- Print dump.
- Grid toggle, meaning draw a grid behind the chart.

Even though we have three data sets, we will use the single bar chart option for now, so press Enter as the cursor is located correctly an entry into this section of the module.

If you want to have a grid, move the cursor to the grid position, press Enter and the word OFF will switch to ON.

Having selected single bar chart, you will be asked which data set you require.

Enter 1, then to the prompts 3D bar chart (y/n) and to Auto scale (y/n) reply Y and the graph will be drawn.

I suggest you always use auto scaling, since this leaves Mini Office it free to fit the graph properly on to the screen.

If you try it for yourself you may well have everything scrolled into a small part of the screen or what is worse, some unidentifiable data.

After drawing the graph you will see the prompt Text (y/n), Enter Y. To the prompt Underline (y/n) enter N and to Enter Text type in "Costs".

You will see at this point that the

bottom left hand edge of your graph will have become somewhat distorted. Do not worry about this as it merely indicates the current position of the text you entered.

Use the cursor keys to reposition this area (just under the Scale * 100 message). As it breaks clear of the graph the text will become legible. Once the text is in position, press Enter. It will be locked and you will be asked if there is more text in position.

If you reply N for No you will be able to use the cursor to select the print option since icon selection will become operational again.

Move the cursor to the printer symbol, press Enter and to the request Select printer type press A for a DMP1 or B for an Epson-compatible and the graph as presented on the screen will be printed off. As soon as it is complete you can continue.

Before leaving the Graphics module for this month we will look at just a few of the other options. The first of these is printing off more than one data set.

While the sequence of commands is much longer than that given above, you will see that in principle it works in precisely the same way. Furthermore I have made it longer still by

using more than one piece of text. Proceeds the data you entered earlier by carrying out the following procedures.

Move the cursor to the side by side symbol and press Enter. To the prompt 2 or 3 sets of data press 2, to 3D Bar chart (y/n) press N, to Auto Scale (y/n) press Y, to Text (y/n) press Y and to Underline (y/n) press N.

Then type "ALL SETS-combined", position the text and press Enter. To the prompt Text (y/n) press N.

Assuming that at some point you had toggled the Grid to ON, the result of these actions should look like the example shown in Figure 8.

Finally for this month, on finishing the print press Escape and select Line Graph.

Note how the icons are very similar to that of the bar chart and virtually parallel to the ones we have met already. The only point to note is the third which has a plus sign. This only produces a single line, representing a cumulative total of the data sets as in the third example shown.

Next month we will examine the pie chart and also most importantly, how data may be transported from the Spreadsheets module of Mini Office II into the Graphics.

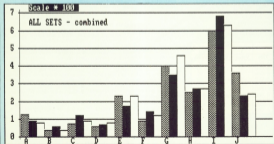


Figure 8. A side-by-side graph using 3 data sets

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PROFESSIONAL DATA SERVICES

RECENTLY I had a letter from a Dr. Allan of Stevenage, Herts, asking for help on two areas not covered completely in John Hughes' "Mastering the Amstrad PCW 8386/8512". His problems were:

☛ For setting up headers my version of LocoScript V1.2 does not give the same on-screen menus as those in the manual or John Hughes' book.

When I enter headers they work, but the printer gets out of step with the screen and finishes the printed page one or three lines before the page-break shown on the screen.

It then prints these missed lines — without the header — at the top of the next page, uses a page break and starts another new page.

Sometimes when I call up G, Layout, from the text-editing mode, I get a menu that does not give the option of a brand new layout, but only the other options available.

This sometimes happens even at the beginning of creating a document, so it is not because too many layouts have been set up.

If you can't get past this hurdle and the layout supplied is unsuitable it is impossible to produce a document, especially if tables are involved.

Can you throw some light on this problem? Is it common or is my copy of LocoScript faulty or prone to a rare bug?

If you are experiencing Dr. Allan's problems I doubt whether there is anything wrong with your copy of LocoScript, though this is a remote possibility. If the solutions set out here fail to work you should have the disc replaced.

The page header problem almost certainly has nothing to do with

Headaches over headers?

GABRIEL JACOBS prescribes a pain killer, and takes a look at layout problems, too

printed headers directly, but rather with page length. Setting form lengths, gap lengths, page size, header margins and so on are by far the most complex operations in LocoScript, and there is no way of explaining them briefly.

Most users never alter the settings that come on LocoScript, the disc with the PCW, but I suspect that at some time Dr. Allan has made changes, such as writing new parameters to his start of day disc, which are now loaded each time he boots-up.

So he should either go back to the master disc — which he should not have unprotected at any time — and make a new start of day disc, or change the settings on the existing one.

But before he does either, since for one reason or another he's got himself into a bit of a cogspline, it would be best to discover a little more about how he got there in the first place.

While editing a document press the F1 key, then F3. At the bottom of the pull-down menu you will see

parameters for form length — number of lines per page in 1/16 of an inch — and gap length — number of lines left free at the bottom of each page.

These are automatically adjusted for single sheet A4 or continuous 11in stationary — you get the same number of printed lines per page with either — and need to be changed only if you are using stationary of a different size.

However if the form length is too short or put out of sync by the wrong gap length setting the effect will be to produce precisely the problem described.

By too short I mean that it does not correspond with the page size settings in the Edit Header menu, settings which are accessed in the outer shell menu of the line-structured menu system. This is the next thing to look at, and eventually the one to change if necessary.

Exit from the printer menu, press F7 and choose Edit Header. Press F7 again for Options, and once again for Page Size. Set the page length at 20 if it is not already at that.

The other settings are a matter of individual taste in page design — some people prefer a fuller page than others, and higher or lower header and footer positions — but the settings have to make sense according to the form and gap lengths displayed in the printer menu option.

If you have a page length of 20 with a page body of 54 printed lines, but also a form length of say, 57,

☛ **Setting form lengths, gap lengths, page size, header margin and so on are by far the most complex operations in LocoScript** ☛



Figure 7: Page elements

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LocoScript will display on screen a page break at line 94 or before, but the printer will give a form feed – page eject – after line 67, and the three missing lines will be printed at the top of the next page.

When those three lines have been printed the printer will get an instruction from LocoScript to start a new page, hence the extra page feed described.

The three lines may be limited to only one or two lines, as Dr Ailin has experienced, depending on line spacing and, particularly, the amount of room left at the bottom of a page when in double spacing since LocoScript will prevent so-called

widows and orphans unless instructed to the contrary.

I have the settings shown in Figure 1 for page size, which give rise a page layout I like, but you can of course experiment with others.

For single-sheet A4 paper the settings in option 1 of the printer menu should normally be form length 70, gap length 3, and for continuous stationery 66 and 5 respectively.

The problem with layouts probably has the same root cause. I would suggest once again that, no doubt by accident rather than design, in some groups Dr Ailin has set up templates in which the number of layouts has been limited to 1, hence the fact that the problem seems to be intermittent.

In theory you can set the number

of layouts in a template to a maximum of 99 – the default is 5 – but the more you have the greater the size of the file, so it makes sense to keep the number down.

However if you set the number at 1 the F2 menu will not display "Standard new layout" since none are allowed beyond the base layout.

In order to change the maximum number of layouts in a template press F7 when editing a document or a TEMPLATE.STD file, choose Edit Header, then F7 again for Options, followed by F5 marked Tab Count as shown in Figure 8.

Tab Count is an inadequate description because F5 in fact gives you not only the number of tabs allowed, but also the number of layouts – it should be labelled Maximum or Maximum Sets as it is, curiously, in the documentation – Volume 1, pages 127 and 128.

I am fairly confident that inspecting the parameters will reveal that Dr Ailin's problem is indeed one of maximum settings. ■

‘ LocoScript will prevent so-called widows and orphans ’



Figure 8: Tab count menu

AN RS232 or serial port fitted to your PCW allows you to communicate with other machines. You can squirt files down a cable, and hey presto! they're copied to the remote disc.

And if you have a modem you can communicate with the rest of the world via the telephone system. In theory, simplicity itself.

Unfortunately the whole business is fraught with difficulties. Quite apart from the problem of getting up the right pin connections at the ends of the cable, there's the question of having the right software - and making it work.

Mail322, which comes free with the PCW - it's a hidden file on the LoadScript disc - will not cope with executable files (those with a .COM extension).

The same is true of PIP, which will happily copy any kind of file from one disc to another on the same machine, but will not handle machine code or non-Ascii files when copying via a serial port.

The free listing (which eventually makes SEND.COM) supplied with Amstrad's SID Interface, is supposed to transmit executable files, but I know of nobody who has got it to work properly.

The only really reliable way to send CP/M .COM files from one machine to

FILE CONVERSION

DAVID BOLTON presents Makehex

another is first to convert them from binary to hex format, then to reconstitute them once they have arrived at the other machine.

Makehex is a program written in Mollard Basic which will convert .COM files to hex format.

Let's assume the cable between the two machines has been set up correctly, and that we wish to transfer a file to the PCW from another machine. The set-up can be tested using PIP. On the PCW type:

PIP COM=HEX

and on the sending machine:

PIP HEX=COM

or with some CP/M implementations:

PIP FILE=COM

If all is well anything typed on the sending machine will be echoed on

the PCW screen.

Test file transmissions should be carried out with a straight Ascii file. If you can't get an Ascii file across, there's no point in trying anything else, and you should either persevere with the mysteries of RS232 or get expert help.

It's worth remembering, however, that the baud rates, stop bits and parity checking of the two machines must match exactly.

The CP/M SETSIO utility supplied with the PCW can be used for this - refer to the manual - and STAT on some CP/M implementations will perform the same function.

Now in order to send a .COM file, load Mollard Basic and run the Makehex program listed here. When prompted for a filename give the name in full, for example FRED.COM. FRED.HEX will automatically be produced and written to disc.

You can check that FRED.HEX is in true hex format by invoking the [H] option in PIP:

PIP TEST=FRED.HEX[H]

which will generate an error message if it is not in PIP secret not covered in the PCW CP/M.

The file can now be sent as if it were an Ascii file. You might find with some machines that after transmission the sending machine has finished but the receiver is still waiting. In this case type:

PIP HEX=COM

on the sending machine and it should clear. If this happens every time use the EOF extension in PIP:

PIP HEX=FRED.HEX,EOF

which will send and then release both machines. (Another unadvised secret.)

Reconverting FRED.HEX to

Hex format explained

A HEX file consists of a number of lines of hexadecimal values, each separated by a carriage return/line feed marker. This lets you type any HEX file and examine it on the screen, or send it to a printer or another machine using PIP.

Each line is in a special format as in the following example:

```
(HEX)FC000117A6235A2211A04
```

and the very last line of the file is:

```
(HEX)000000
```

Each line starts with a colon and consists of several hex values without spaces conforming with

the following structure:

HE ADDR TY DATABYTES CS

where HE is the Number of Bytes of data, usually a multiple of eight, ADDR is the address at which the bytes are loaded into memory, TY is the type - usually 00, DATABYTES are the bytes themselves, and CS is the checksum. You get this by adding up all the previous byte values and subtracting the total from 256.

In the above example HE is 08 (8 bytes), ADDR is 5F63, TY is 00, the data bytes are from A1 to AA and CS is 24.

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.COM file when it has arrived depends on the version of CP/M you're using.

On the PCjr, the utility to use is HEXCOM.COM. The command HEXCOM FRED will produce FRED.COM from the Hex file.

On other machines you will probably have to use LOAD.COM - again, LOAD FRED will produce FRED.COM.

And that's all there is to it. Once you've entered the listing and debugged any typing errors you'll find Makehex an invaluable utility. ■

PROGRAM NOTES

Line 490 writes 10 zeros and a colon to the file, needed for the LOAD or HEXCOM program to realize that the file has finished.

The width statements in line 110 and 470 are to prevent the occasional line feed from disrupting the line number counter. Setting the width to 255 stops any line feeds from being sent.

File names like FRED or FRED.BIN can be used for the input file and in both cases, an output file of FRED.HEX will be created. INSTR is handy for things like this (lines 160 and 170).

Note also that the file PB is checked in line 150 to see if it exists. If it doesn't, the program loops back for another file name.

The constant NUNBY (line 120) can be altered, preferably to a multiple of 16, but never more than 255. Higher values than 16 will give a slightly shorter time for conversion and longer lines in the .HEX file.

Lines 40-60 define screen codes. They can be used in a PRINT statement and the program has several examples (lines 130, 140, 180, 200).

I have used constants like NUNBY, INFILE and OUTFILE because they make the program easier to understand and easier to modify. If I hadn't used NUNBY then any change to the hex line length would need lines 240, 260, 310, 330 and 360 changed.

VARIABLES AND FUNCTIONS

ERRC	Defines error codes.
FILE	Current word of line.
FREQ(FREQ)	Moves the cursor to row F, column F.
CLR	Clears the screen.
FNUM(I)	Gives the remainder after dividing I by 256.
FLOW(I)	Clears the low 8 bits of a 16 bit number.
FHIGH(I)	Gives the high 8 bits of a 16 bit number.
NUNBY	Number of bytes to be put on each line in the .HEX file - a constant.
PB	Holds the name of the input file.
F2B	Holds the name of the .HEX file.
STARTADD	Holds the address to where the bytes in each line of the .HEX file are loaded.
LIN	A counter of the number of lines converted to hex.
INFILE	The number of the input file - a constant.
OUTFILE	The number of the output .HEX file - a constant.
RD	Used for accessing random files.
LOW	A working copy of L2.
CHSUM	Masks checksum value while it is calculated.
OUTL	Output line. Holds all hex values before they are written to the .HEX file.
VB	Used to calculate the value of each byte while converting it to hex.

```

10 WIDTH 255
20 OPEN "A:"
30 HEX OPTION SCREEN CODES
40 C00+C0A+C21+C24+C0A+C21+C3*
50 DEF FREQ(I)=I/NUNBY
60 DEF FNUM(I)=I-((I)/NUNBY)*NUNBY
70 DEF FLOW(I)=I-256*(I/256)
80 DEF FHIGH(I)=I-256*(I/256)
90 NUNBY=16
100 PRINT CLR;FNUM(I),I,"CONV
RT TO HEX"
110 PRINT FNUM(I),I,"ENTER FILE
AND *FREQ"
120 INPUT PB,OF:FREQ=**" NUNBY
130 DEF
140 PB="(CHR$(PB),*)"
150 IF PB=0 DEF F2B="(PB)";DEF CLR
F2B="(PB)F1,1,F2)=**";DEF
160 PRINT FREQ(I),I,"CONVERTING
*FREQ) **" *F2B
170 CLR
180 PRINT FREQ(I),I,"*L2"
190 STARTADD=0
200 LIN=0
210 INFILE="(IN)";DEF OUTFILE="(
220 OPEN "A:";INFILE,F2,NUNBY
230 OPEN "A:";OUTFILE,F2,NUNBY AS LA
240 GET INFILE
250 WHILE NOT EOF(INFILE)
260 PRINT FREQ(I),I,"(L2)";LIN=LIN+NUNBY
270 LIN=LIN+NUNBY
280 OUTL=OUTL+FNUM(FLOW(INFILE))
290 OUTL=OUTL+FHIGH(FHIGH(INFILE))
300 OUTL=OUTL+CHR$(INFILE)
310 CLR
320 OUTL=OUTL+(255-OUTL)
330 OUTL=OUTL+CHR$(CHR$(255))
340 OUTL=OUTL+CHR$(CHR$(2))
350 OUTL=OUTL+CHR$(CHR$(0))
360 CLR
370 OUTL=OUTL+(255-OUTL)
380 OUTL=OUTL+CHR$(CHR$(255))
390 PRINT OUTFILE,"*CONVERTING*
400 GET INFILE
410 CLR
420 PRINT OUTFILE,"*CONVERTING*
430 LAST LINE READED IN HEX FILE
440 CLOSE : FOR ALL FILES
450 WIDTH 80
    
```

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I HAV'VE written many times of my belief that users frequently get more software than they need and therefore suffer a whole raft of problems. In general I therefore advise getting the simplest software that will do the job.

Coming from Minerva's First Base handbook, this system is meant to fulfil just such a need for:

- "A simple to use introduction to the database world."
- "Mail merges...using... Lotus-Script."
- "The facility to output files in Ascii format... into a more complex database."

It will therefore come as no surprise that I immediately accepted those as genuinely worthwhile goals. What was more pleasing was that within minutes of working with First Base it was also evident that this system also met these needs very well.

Nevertheless the more time I spent with this product, the more it set me thinking about the point at which this principle is taken to excess. For the person who genuinely requires, and more importantly will continue to need a minimal system, Minerva have produced a sure-fire winner. However users who are merely nervous about their first tentative steps in computing must accept that while First Base will provide them with an outstanding

Can a product be too simple?

JO STORK reviews First Base, a database program that aims to be as user-friendly as possible

introduction to databases, they could quickly have a product which will prove a frustratingly inadequate business tool.

The more I looked at each of the three Minerva aims in turn, the more it appeared to me that while a simple introduction to databases is definitely needed, it is only likely to be required for the first few hours of familiarisation. After a month or so, extra facilities would probably be sought, and then First Base would have to be ditched. This is despite the sorting, searching and record selection being first rate if limited to single fields at a time.

Records with a maximum file size of the capacity of the disc, a maximum record length of 1,800 characters, and/or a maximum of 255 fields with a maximum field length of 80 characters should be enough for

most users, new or otherwise. The problem arises in that no arithmetic is provided, which reduces the functionality to little more than an electronic card box.

If this is all you need, then First Base is a gem. It took me less than ten minutes to produce the example shown in Figure 1, of a database I maintain on another system for keeping track of the software I receive for review. Providing so little does make First Base delightfully simple in operation. The problem is that it can not handle the many tasks a database can be put to, such as the simple cash book application I described in more detail in the July issue of *Business Computing with the Amstrad*.

First Base is ideal for creating and maintaining name and address files, consequently the second need Minerva identified, mail merge, can definitely be used throughout the equipment's life. Sadly this too faces a restriction, albeit not of Minerva's making.

The cause is the PCW itself. This computer brought equipment with a price and performance into a market which hitherto had not existed. Nevertheless it must not be forgotten that it has been produced to meet a price of £399 or £499 while allowing Mr. Sugar to enjoy a pleasant life style. PCW marks to him for having provided a printer at all, but make no mistake it is inadequate for mail merge. The reasons are simply that it is too slow in I/O and also does not have a multi-sheet feeder.

PCW brings in mail merge quickly become torturing. Consider the example of a simple 30 line letter for 100 clients. Each letter would require about 45 seconds of actual printing time. If you can stand loading and



Figure 1. The Minerva Record in use

aligning paper every minute into the PCW printer, then all well and good. If like me you are unwilling to become first cousin to a yo-yo, there is no alternative to buying a printer with a stacker. I particularly like the Star, which would bring the time down to under an hour with only a single recharge of the paper from the PCW printer's two hours plus however long you need to relax in a foam bath, easing calf muscles made sore from all this bobbing up and down.

Compare this with a maximum of two hours to create and load the name and address file including writing the letter and you can see why First Base is not the problem. These timings are based upon the time required to produce a letter and its associated database, plus 50 per cent to allow for a first time user's slowness.

The mail merge is as easy to use as everything else about First Base, but again suffers from being just too minimal. Unless you know how to get NLD printing from within CP/M-land the First Base manual gives no guidance in this area, the natural print style is draught mode which rather defeats the whole point of the facility. It is just the first time user market that is likely to struggle to get NLD at the correct pitch.

I believe this is another case of simplicity having once again been taken too far. Even if this is not the case, all that was needed was a paragraph in the manual explaining how to achieve NLD and perhaps another two describing the layout settings to be used in Letterprint.

I have made much of these misgivings, but do not dismiss this system as merely a toy. It is far better than that. Furthermore, in one of my pieces, I wrote that Mini Office II at under £20 is an excellent buy, even if you eventually replace all its modules with separate and more sophisticated packages. Once you had familiarised yourself with Mini Office II you would know the precise features that are required.

The same is equally true of First Base since until such time as a PCW version of Mini Office II is available, it can serve this purpose as far as databases are concerned. However be warned that this is not as simple as Minerva claim. They are quite right in



Figure 1: A computer record ready for merging.

saying that £29.95 is not much in terms of an organisation's turnover, but do not forget that if huge files have been built, the investment in time is another matter. I would hate to transfer 5,000 records of 200 characters each to a different system, and then still have to look on the computational fields required. What is worse is that sadly this is not all that may be involved.

Using the Accl output facility is no problem, and at first sight seems like a wonderful tool for transferring data from one micro to another. This sounds marvellous in principle and you realise that many databases spew strange characters throughout their records, to identify all manner of parameters and controls to the database software itself. You are going to be overjoyed if your Mk II database (shows up your simple Accl records in trying to read them in without these control codes.

The original file on First Base will not be corrupted, but you will have to choose the more advanced system very carefully to ensure that re-entering all the data from the keyboard is not needed. By the time you read this Minerva will have just such a database available, and if it is as well written a piece of software as this, then look no further. However should it not prove suitable, Minerva must also indicate which other databases/

they have planned this facility to link up with.

Putting all these comments together one fact should now be clear, despite my criticisms, First Base is certainly ideal for the first time user, but the prospective purchaser must decide what he will want from his PCW in the months and years that follow. The software is so exceptionally easy to use that you could not get into trouble despite those seven pages of manual, no matter how inexperienced you may be.

Unfortunately, the vast majority of users that First Base is aimed at will not remain for long in First Base's market sector. Consequently, only if you are a new user and the features that it lacks will not prove to be serious long term limitations, can I give this database an unqualified recommendation.

I just can not help thinking that First Base may have gone too far in the direction of simplicity. The market niche is certainly there, and Minerva have the only product I know of that currently owns attempts to fill it. My doubts are that it may not be as large as we all believe. ■

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It was my wife Carol, the practice manager, who first suggested that we ought to have a word processor. We have a veterinary clinic for domestic pets in Caversham, Berkshire with a branch surgery five miles away in Woodley.

We have two full time veterinary surgeons, two qualified veterinary nurses, a receptionist, and a few auxiliary staff and are always busy.

In addition to keeping track of correspondence, I use the POW256 for printing information sheets for clients, invoice forms, consent forms and wordsearch games for children in the waiting room, which have proved very popular.

I have compiled a practice manual to answer most queries when I am not available plus a current price list and endless other useful pieces of printed matter.

The saving in printing costs and the convenience of being able to update and produce just as many as required are obvious advantages.

The label printing option is very useful and we even took a roll, ready printed with all our friends' names and addresses, on holiday with us to avoid missing anyone out for a postcard.

I read in a recent letter that someone ran out of space for names on his work disc. He must have a lot of friends. By creating new groups you can get 192 14 address blocks in single columns of 19 with a further 274 for standard letters as an extra first column in DRGUP 0, on one side of a CD3 disc. A lot of people seem reluctant either to create new groups or to use drive M properly; these advantages are not obvious from the manual.

You can store all the information up to 14 in these blocks, then Copy, Cut and Paste as many items as you like as often as you like in one session. It is just as quick to insert those when required as to go through a mail merge list to eliminate unwanted material.

When reading e-zifiles of LocoScript I usually run the program to see for myself. In nearly every case the e-zifile is either unfounded or there is a way round it.

Those that are disillusioned by the POW256 don't really know how to use it and think it is just a complicated typewriter. This is far from the truth.

Carol mostly deals with the

BARKS AND BYTES



Veterinary surgeon Christopher Shree, with wife Carol (left) and Head Nurse Don (right), putting their help on line

correspondence and keeps track of the accounts to send out, although these microfiles are now few. Since we are basically a small business where cash flow is important, it's worth at-the-time, whenever possible.

The first few steps with that user manual were tedious, confusing but often amusing. The manual is no

price is still too high compared with 5.25in floppies.

I would question the value of more than a few hours demonstration of LocoScript, since its many functions, often rarely used, are hard to take in all at once. I am sorry if this denies the many admirable instruction centres of applicants, but maybe only one person should learn and then pass the information on a little at a time when a particular problem arises.

Next came the exploration of other software. I thought I must have the mail merge facility and a small database so I bought FlexWrite and FlexFile (now MicroWord and MicroFile). In fact I haven't needed either.

Mail merged letters are a little naive with me ever since Reader's Digest, and the enormity of task of committing thousands of records to file is prohibitive.

When it comes to clients or patients records it is easier to scan

By CHRIS BERRY

wrote that many others and actually does make sense - in retrospect.

My approach was to get stuck in and learn as I went. I'm still discovering things.

Having got used to LocoScript and having tried other word processors I would say it is excellent. Its few shortcomings are soon to be made so, I understand.

The most irritating thing in the early days was the shortage of discs. This is no longer a problem, but their

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From Page 25

several cards at once by hand and it doesn't permanently tie up the computer as would otherwise be the case. The great benefits of selective retrieval of information for disease surveys or lost animals are ending and perhaps this will come.

One great advantage of FlexiWrite is its ability to print up to 999 copies of the same document continuously. The only way to do this with LaserScript is to insert the same document several times to form one long one - which is fine if you want 10 or so at a time, but greedy on disc space.

Then came the accounts. We do have a friendly accountant who is there for advice, the tax return, appeals, and the annual balance sheet, but we kept our own cashbook and daybook manually. After careful searching we bought the Compact Daybook package and considering its price it suits us fine.

We now spend only a few hours on this chore monthly and you can actually read what the figures are supposed to be.

VAT is easily extracted to go out on time and avoid interest charges on overdue payment to Customs and Excise. Accountant Tim was impressed and envious of our PCW and a little concerned that he would no longer be required. This is not the case, since the personal touch is still important. We are trying to get him interested in getting a compatible system so we can transfer data by telephone.

Payroll was soon to follow and this again, although not particularly time-saving, is kept neat and tidy and looks more professional.

Amsoft's own Paymaster seems perfectly adequate for relatively small businesses and is competitively priced.

I became interested in what else the PCW could do and by trial and error learned how to manipulate CRMS adequately. Being a regular reader of Computing with the Amstrad, an article prompted me to have a go at upgrading.

Silver City's upgrade kit was easy to fit though I do have complete confidence in my manual dexterity and you do need both that confidence

and suitable tools for the job.

The cost of the upgrade was well worth it and certainly less hassle than trading in for a new 6612. The invalidation of the guarantee is not really relevant in my case because the machine is now nearly one year old and is obviously reliable.

This in itself is truly amazing since you can expect most modern appliances to give trouble nowadays. They are, after all, extremely complex and susceptible to the vagaries of the microclimate and the clumsiness of some people. Even the static generated by brushing hair or by man-made fibre clothes close to the machine is important.

Recently I bought the new Amstrad V2123 modem and have

I programmed my keyboard using the SETKEYS utility so that I can select any program on a self-designed disc menu by single key strokes. On contacting a BBS, I have programmed single key strokes for first name, last name and password to avoid wasting expensive time on-line. I am looking at Prestel and Telecom Gold.

My eldest daughter Sarah-Marie, 13, has an Acorn Electron with Plus-1 interface and is dying to hook up the modem to get Prestel in colour. I have had to buy the View on rom word processor and a printer to keep her away from the PCW.

The Basic games I used to make up for her on the Electron do not transfer easily to the PCW but I have tried a few and one was accepted by Computing with the Amstrad recently.

The games department is extremely helpful if anyone is considering submitting a program. I have rarely improved mine ever since it was accepted and this gives a wonderful sense of achievement.

The PCW does not lend itself well to games, as it is a little slow on screen movement and, frankly, adventure games, mazes and bio-rhythm programs bore me to tears. I just wanted to prove that the PCW could do things like any other computer.

One useful utility is a word-counting program, and I use the one in Computing with the Amstrad (September 1988) by John Milson which I modified to my needs, including a display of the rising count and a No File check.

Employing school-leavers when as I do, I find their literacy skills inadequate and spelling checker programs will be a necessity. Here comes a problem where reliance is made on such facilities - already shop assistants are lost without a calculator.

The fact that IBM compatibility seems to be the trend does not seem to be a problem, and this new Amstrad Network looks exciting. All this seems a long way from the first computer, a ZX81, which I still have in working order.

The whole computer concept is surely additive once you get into it. Whatever next? ■

VETERINARY WORD SEARCH

```

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* E E A T B M L V O I
* E A A N Y B I T B
I I I O R Z N Y V
* E E E E E O E E P E
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* P O A S E U S H
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* Y I S T W P P G B
L J M T A O Z H O I
* A A E Y T E U H
* E T T T E R W H
* E E S O T R O I
    
```

in the grid are 13 small jobs that you might take on the veterinary surgery. The words may be written backwards, up, down or diagonally.

had fun communicating with bulletin boards.

I constructed my own comma disc with FlexiWrite on it in addition to the comma programs PCWURMY.COM so I can edit and print files before or after transfer. MAIL232, which comes on the system disc, is not really ideal, but you can download even a less program as April and then convert it to a working program using the HEX.COM utility.

SPREADSHEETS are a Good Thing. They must be, there's a lot of them around and some cost a fortune. One of the standard excuses for buying a mine is that it will help with both business and home finances. And spreadsheets are quoted as one of the things that will help it to do so.

But what are they? How do they work and what use are they? This is the start of a short series designed to answer some of these questions.

Briefly, spreadsheets are used to perform all sorts of business calculations. But, pervasively, before we get on to spreadsheets, let's look at how these calculations were done before their advent. This will, hopefully, give some idea of why spreadsheets are used and a glimpse of what they are used for.

As an example, let's look at the first three months' trading of a small company: it could be the Sellfield Lark Company, purveyors of vegetables that glow in the dark, or Lash Garden Capery Ltd selling off the excess fish caught by the birds. Whatever the company they're in it for the profit.

And to calculate the profit you've got to know all sorts of things like how much it costs to make one unit of whatever it is, how much is charged for one unit, how many of them have been sold, and so on. Figure 1 shows these details for one particular product over three months.

The figures are laid out in tabular

	UNIT PRICE	NUMBER SOLD	UNIT COST	TOTAL COST	MONTHLY SALES	MONTHLY PROFIT	YEAR PROFIT
JAN	10	20	8	160	200	40	40
FEB	10	20	8	160	200	40	100
MAR	10	25	8	200	250	50	225

Figure 1. Sales, costs and profits

Whatever the company they're in it for the profit

Get a good thing going

In the first of a new series, **NIGEL PETERS** looks at the hows and wherefores of spreadsheets

form and there's no great mystery as to how they're arrived at. Taking January (when Lash Garden Capery Ltd must be selling frozen fish) there are 20 units sold. Now each of these units cost £10 to the customer (probably salmon) while costing the company some £8.

From this it's not hard to see how the figures for monthly sales are calculated: you just multiply the number of units sold by their price and you end up with the monthly sales. In January this is 20 times 10 with the result £200.

Similarly the total cost is found by multiplying the number sold by the cost to the company. So the total cost of producing the items sold in January is 8 times 20, or £160. The

monthly profit is the money got in from the sales minus the money spent making the sales, a magnificent £40. And this is also the profit to date.

Now have a look at February's figures and see how they fit together. The unit production cost and selling price are the same but the number sold has increased. This is reflected in the total monthly figures for sales and costs and gives an increased profit of £50. This is duly added to the previous £40 to give a profit so far of £100.

Getting on to March, a glimpse at the figures shows costs have risen, and profits for the month have fallen. The company will have to make some decisions.

Leaving this dire financial outlook for the moment, there's one important point about all the calculations above. While the figures may have changed, the calculations done with those figures are the same. No matter what the price or the number sold, the monthly sales were found by multiplying them together.

It's the same with the monthly costs and the profit. The figures, and

	UNIT PRICE	NUMBER SOLD	UNIT COST	TOTAL COST	MONTHLY SALES	MONTHLY PROFIT	YEAR PROFIT
JAN	10	20	8	160	200	40	40
FEB	10	20	8	160	200	40	100
MAR	10	25	8	200	250	50	225

Figure 2. The same data

consequently the results, may change but the operations done on them are the same. No matter what the month, the new total profit is found by adding the monthly profit to the total profit figure for the previous month.

Still studiously ignoring our computer with its spreadsheet program let's look at how we'd have to do these calculations. Almost certainly we'd get the figures for sales, costs and numbers sold and put them in a tabular form on a piece of paper. The total costs and so on would be left blank for the time being. Figure 11 shows the idea.

Next you would come the calculator, pencil and eraser and then the hard work. You'd work through the figures column by column, line by row, filling in the results from the calculator. And you'd be doing the same job (in each month's figures, the figures themselves being the only thing that changes).

That seems simple enough, but in real life it's not. I mean you're never likely to get the nice neat figures I've used. And there are bound to be a lot more columns.

What about VAT and overhead costs, depreciation and all the thousand and one things that complicate to make the small business man's life a misery? (Even tall business men suffer).

So our little table of figures would, in reality, be a lot more complicated and a lot larger. In fact there's a tendency to end up with sheets of paper spread everywhere.

Worse than that, suppose you made a mistake somewhere, maybe an inadvertent slip of the finger resulted in your calculator telling you that February's profit is £80 instead of the £85 it really was. Notice that the effect of the mistake isn't limited to that month. It carries over into the accumulated profit figures for March.

And then what if, in March,

someone returned some goods that had been sold in January? The figures have to be adjusted, changing the profits. Again, it's not just confined to January, the effect "ripples through" the results for the other months.

As you can see, what seems so simple actually becomes a frustrating, time-consuming business using up pencils, paper, calculator batteries

them to do it, and that program is a spreadsheet.

With a spreadsheet you give the program the raw data, tell it what calculations you want it to do and the computer gets on with it. Figure 11 shows a simple spreadsheet layout, containing our raw data. The screen has replaced the paper, the keyboard, the pen, rubber and calculator.

You'll notice that the figures are still in tabular form but now they're held in a grid. How we get the grid in the first place and how we get the data into it we'll come to next time.

As you can see, the grid is marked with letters for the rows and numbers for the columns. With these you can refer to any of the boxes or cells in the grid. The number of products sold in February is in C2 while D4 contains the increased cost.

Using these cell names we can get the spreadsheet to do our sums for us. For example we find the total cost by multiplying the unit cost by the number sold.

To get the spreadsheet to do this for January we tell it to take the number in D1, multiply it by C2 and put the result into E2.

It's done by putting the formula C2*D2 into cell E2. This tells the computer where to get the figures from, what to do with them and where to put the result.

Again don't worry about how that's actually done, we'll come to that later. And if the wobble worries you, it's just the sign the computer uses for multiplication. Similarly to get the monthly sales we put the formula B2*B2 into cell F2. In this way we show the spreadsheet what we want it to do.

Now at the press of a button it does all the sums for us and puts the results where we want them. No

Computers are good at handling data and can do repetitive tasks with ease and remember things that they've done before

and, especially, rubbers—which never seem to be around when you need them.

This is where the spreadsheet comes in. Let's think about what we've been doing in general terms.

First of all there's the raw data, the stuff held in Figure 11. Then there's the calculations done on this data. In this case they're the same for each row, a repetitive bit of maths.

And finally, notice that one of the calculations, the total profit, isn't confined to just the figures in a row, it grabs one from the row above.

Now this is what computers are good at. They're made to handle data, can do repetitive tasks with ease and remember things that they've done previously. And they do it all much faster and more reliably than humans can.

All they need is a program to get

	Month	Unit price	Number sold	Unit cost	Total cost	Monthly sales	Monthly profit	Year profit
1	January	10.00	20.00	5.00				
2	February	10.00	25.00	5.00				
3	March	10.00	25.00	5.00				

Figure 11: A simple spreadsheet layout

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 - A class code, one of up to 50 defined by you to suit your circumstances, e.g. 00-Household expenses, 10-Mortgage, 20-Utilities or 30-Transportation, plus other categories, e.g. 40-Interest, 50-Partnership, etc.
 - A description so that you can see what each transaction was for, e.g. "New garden" or "Bills of 10-Club".
 - An optional cheque or deposit track which you can include for further classification, e.g. 10-Overdrawn, 20-Deposit, etc.
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From Page 29

more hammering a calculator!

However, it can do a lot more than that. Remember that with our paper-and-pencil method the calculations were the same for all the other rows, only the data was different.

It's the same with the spreadsheet. But with a spreadsheet you don't have to go to the trouble of entering every formulae for every month all over again. You can just tell the micro to do what it did on the row above, only with the new figures.

So once you've got the formulae for the first row you've got it cracked. The micro does the rest of the job for

you and at the touch of a button the computer does all the calculations and puts the results in the appropriate cells.

Figure IV shows the results.

I think you'll agree that it's a lot easier than the pencil-and-paper method. And you can do a lot more. Mistakes are easy to correct: if you find that only 25 units were sold in February you can just change the 30 in cell G3 to 25, press a button and the program recalculates the lot. The changes ripple through and the correct figures appear.

Also planning is made easier. It's simple to save your spreadsheet to keep your details intact and then

mess around with it, seeing what different prices and sales would do to the performance of the company.

Spreadsheets can't make your decisions for you but they do allow exploration of alternatives.

And now, having given a brief glimpse of what spreadsheets can do, there comes the question of how to use them. How do you set up the grid and enter the formulae? The answer is, provided you've got a good spreadsheet, easily.

● However, that comes next time when we'll be exploring spreadsheets in more detail. But be warned! Spreadsheets are fascinating and can be addictive!

	Unit price	Number sold	Unit cost	Total cost	Monthly sales	Monthly profit	Year profit
1							
2	January	30.00	25.00	750.00	300.00	45.00	45.00
3	February	30.00	25.00	750.00	300.00	45.00	180.00
4	March	30.00	25.00	750.00	300.00	25.00	125.00
5							

Figure IV: The spreadsheet puts the results of all the calculations in the appropriate cells.



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handles all S.S.P. rates and cares for full attendance records and automatic calculation of S.S.P., qualifying days and S.S.P. to be paid.

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the system cares for 15 additions - pre and post tax - each of which may be pre-set (e.g. union) or entered for each period (e.g. expense). The post tax tax deductions may also be factored on a sliding scale from the pay period.

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Sines of the times

THE basic supplied with my PC168512 does not support division or arcsine — the ability to find the angle given the sine or cosine — although it does enable division to be used.

Was it a American that I would find particularly useful?

Is there any way to get round this or is there any other basic available that would satisfy this requirement? — C.B. Wass, Drayton, Manchester.

■ You have hit on a tricky problem. Some Basics — such as BBC and QL — have built-in ASM (arc-sine) and ACS (arc-cosine) system words, but they are not exact functions in the way that SIN or COS are.

They depend on given conventions, and are susceptible to giving seemingly spurious results when handling certain values.

They can be simulated in Multimed Basic or Microsoft Basic as follows, with the proviso that for some values further traps beyond the ones given here — and which can become quite complex — may have to be incorporated.

To calculate arcsine where *X* is the value entered and *Y* is the result:

```
100 Y=447031
110 IF ABS(X)=1 THEN Y=0
120 Y=2.314432 ELOG(1+ABS(X))
130 Y=
```

To calculate arcsine with the same variables:

```
100 Y=447031
110 IF ABS(X)=1 THEN Y=0
120 Y=2.314432 ELOG(1+ABS(X))
130 Y=
```

Multimed Basic also lacks degree and radian functions, but to convert from radians to degrees, you can use something like the following routine, where *F* is the tangent, and *Y* is the result in degrees:

```
100 F=447031
110 Y=447031
120 Y=447031
```

For entering values in



**Edited by
Gabriel Jacobs**

degrees something like the following is required, where *A* is the angle in degrees:

```
100 F=447031
110 Y=447031
120 Y=447031
```

Under examination

I CAN an Amstrad PC16256 and I am writing to you for some help and advice.

I am a deputy headteacher in a comprehensive school and a major part of my work involves the external examination entries of some 150 pupils in January/February.

While some examination boards supply a program for entries, this is not available in a format for the QL55.

Furthermore although the school is well equipped with computers the machines are in use all the time and I find they need absolute peace and quiet to do this work because of its detailed nature. I therefore do most of it at home.

Last year I submitted our CSE entries in a form which I created on the word processor. However, when it came to CD sheet entries it would have meant typing all the names out again for several boards which we use. The split goes up and I

filled in the usual forms in triplicate supplied by the particular board.

At the end of the entries an analysis has to be done and I also produce analyses for the head and directors for internal use. There are about four of these, one for each board that we use. The word processor will not take numbers, and that tedious job has to be done manually.

I therefore went along to the local computer shop where a former pupil works. I was advised to buy Cardbox, having explained what I needed to do, so I bought it.

On discovery of the frustrations of trying to understand the instruction manual (which to me was written by someone with a PhD in computer programming and not by someone who was trying to get himself into the shoes of a beginner) then the pros and cons of Cardbox soon became clear.

I could design a card which allowed me to enter each candidate's entries with all boards and I could make the machine print out lists for staff at all the pupils who were entered for their subject.

But I had to type in all the information again and I could not read the lists with a title. This had to be done manually, and it was not for the pupils in numerical order.

Cardbox does, however, by its selection procedures allow you to read the numbers of

candidates entered for particular subjects, and I can call up a pupil's card and amend it in seconds.

So I seem to be looking for a program which has the best of both worlds and this is why I'm writing to you.

I wonder whether *ASpell* will do these things for me. If it will not do them all, perhaps you could tell me what it will and will not do so that I can decide for myself.

Knowing in mind that its price has come down by a considerable amount recently and that the money comes out of my own pocket, it is obviously an attractive proposition.

To summarize, the package needs to be able to do the following:

- Allow all candidates' subject entries.
- Offer candidates in numerical order.
- Total number of candidates taking a particular subject.
- Have the facility to put a title and then be able to list all candidates taking the subject.
- Select an individual's entry by some form of indexing system. — S.B. Phillips, Brown Edge, Staffs.

■ In the early days of micro (not all that long ago), if you had wanted a piece of software for a special application you might well have gone to a firm of consultants.

After discussing your requirements they would have had the package written to your precise specifications.

Today the applications software market is little different from that of off-the-shelf jeans and T-shirts.

Nevertheless, before your former pupil recommended Cardbox he should have ascertained what you wanted to do with it.

Cardbox is a superb electronic card-indexing system, but it was designed to be just that — the equivalent of cards in a box, but more flexible.

For many purposes it is perfect: bibliographies, names and addresses, inventories, and similar lists. It was not



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designed to do calculations or numerical sorting, or to produce specialised report layouts.

The more powerful a data management system is, the more difficult it is to handle. The dBaseII package will certainly do everything you want (and much, much more) but learning how to use it is another matter.

Despite what you say about the Cardbox instruction manual, it is one of the best documented pieces of software around. So if you found the Cardbox instructions difficult to follow, I can't imagine what you would make of the dBaseII manual.

Go back to your local dealer and ask if you can have a glance at it. (Take some copies with you!)

There are, however, databases available which will fit your requirements and which are not a quantum leap away from Cardbox's simplicity.

One such is Sagessoft's Database. This will suit your pupils' number codes, do calculations, index selected records, and with a bit of fiddling will handle headings.

But you will have to devote some time to planning the structure of files a little more carefully than you had to with Cardbox, and to experimenting with practice databases before using the program for real.

It is not as close to a programming language as dBaseII, and it uses an English-like command vocabulary, but you will need to read the documentation carefully.

There are also many other database systems worth considering: Flexfile, Atlas, Datagen and Cardbase2 are some examples.

All will meet your requirements and are designed for maximum ease of use, but again the question of power versus flexibility applies. Some people think them better (and better value for money) than the Sagessoft product.

Flexfile offers ready-made "templates" to be used as-is or

adjusted for individual needs. A school records template appears on their list, but we haven't tried it out.

It would be best if you could arrange a demonstration of one or more of these products with your former pupil. You may think he or she sees you that!

Retrieve revisited

I *WILL* start your reviewer of Sagessoft's Retrieve in the August 1988 issue of Business Computing with the Amstrad, although sounding rather damning; but not said enough about its limitations. It describes the documentation as of a high standard, which suggests to me that it is not used to the standard of my Lotus 1-2-3, Synchro, the IBM PC-DOS manuals or even the excellent Datagen database manual for PCs.

The Retrieve manual is, in my opinion, particularly weak on the enquiry processor. The system design uses different keys in each of the three parts - entry screens, enquiry processor and report editor - for manipulating data on the screen.

This is infuriating, especially as, if you use Delete as the enquiry processor (after using it as an entry screen), strange things happen and the screen can lock up.

The enquiry processor can reject a valid entry without any explanation, even though it worked before. It appears to be syntactically correct in ways which are not explained, and the error messages are often unhelpful, such as "The verb LIST cannot be recognised".

There seems to be no way of browsing through a file, so can you call up all the fields of a selected record?

Your reviewer clearly did not try the label utility. Not only is it limited to six lines, which is inadequate for many

addresses, particularly companies, but you cannot put more than one field on a label.

As you need to separate any name from title and initials for mailing purposes in the record specification, the two limitations together make Retrieve unsuitable for labels which are to be used for mailing.

For a simple but robust database Datagen from Gemini Marketing an £75 seems to me to be much better value.

It is easy to understand and has helpful screens and an excellent manual (but no letter editor).

For those with more comprehensive needs Delta an £700 has a long track record, good documentation and much better facilities. — **Bonnie Hopley, Poole, Dorset.**

■ I did not review Retrieve, but Database, a development of the Retrieve DBMS. But taking up your point.

□ **Documentation.** As Brian has done up it, everything is relative.

Sagessoft's documentation is of a high standard for what sets out to be — you don't expect leather upholstery and a walnut drinks cabinet in a Mini Metro.

The manuals for Lotus 1-2-3 and Synchro are superb, I agree, but look at the price.

And you can't be serious in comparing the IBM Operating system manuals (which as it happens are very far from faultless with a small booklet describing a comparatively simple database).

As for the Datagen documentation, it is (nearly) well written and nicely organised, and illustrated with worked examples, though in the PC version the page layout is generally too cramped, and a proper system of indexing is lacking.

But Sagessoft's documentation for Database is far the most part just as good in my opinion — not perfect, but of a high standard.

There are fewer sample

applications, but if anything they are more imaginative than those in the Datagen documentation.

□ **Making the program.** You are right to point out that there is an unnecessary difference in the Delta procedures between the entry screens and the Enquiry Processor, and I should have mentioned that the old frustrating CP/M charmer of repeated character tests between / signs ought to have been abolished — my apologies.

However, the keys used in the Text Editor are identical to those used in WordStar (save for the Save command) — not a bad choice for what is to all intents and purposes a word processor, since many people will be used to what has become the industry standard. I would consider that a plus point.

I had no problem with the syntax of the command procedure, and have been unable to simulate the error you describe. Is there a bug in our copy, perhaps?

True, there is no Browse facility as such, though I found LIST list all field numbers ably.

I'm not sure what you mean by calling up all fields of a selected record — if you enter the record number under the data entry procedure (instead of a + sign for a new record), all fields and their contents for that particular record will be displayed.

□ **Labels.** You're wrong here — I did try out the label printer. It is not the best available by any means, but it is good enough for many purposes.

Some labels will not take more than six lines, and a name and five address fields is fairly common in meeting the formal conventions.

I have to agree with you that the problem you mention of separate fields for titles, initials, and surnames is potentially frustrating, but it can be solved.

It is possible to do a search/sort by title plus a wildcard, if the title appears

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first in the name field (as it almost invariably would). For example, LIST MEMBERS with NAME = "MARY".

This method will cause further problems about sorting by surname, but they could be solved in turn by an additional field containing the surname alone.

All this may be a case of the tail wagging the dog but, after all, the tail will wag as if it is wagging if you move your head in line with the dog.

□ **Database and Data.** Datasoft does have a long track record - in fact some would call it antiquated, and the price is very high for what you get.

Datasoft is very good value for money indeed, and offers some nice features such as "saved access" (indexed files) and the ability to allow amendments to a file structure even when data has been entered.

But it has its shortcomings, and these are not confined to the lack of a label writer. It is not the place to do a review, however.

My last dict, when all the dust has cleared, personal preference is an important factor.

It would be perfectly feasible to compare all available databases using a points system. We would then see clearly which one had the highest score.

I tried that idea once in this magazine when I compared two word processing packages. The result was a mailing of letters criticising my criteria for allocating points.

**Kermit
and CP/M**

SINCE reading a letter asking about Kermit for the PCW I have noticed other writers because the lack of Kermit or equivalents which would allow usage of the large amount of CP/M software in the public

domain. So far I've not seen any suitable reply, so here goes.

About three months ago I bought the CPW 8224 RS232C/centronics interface module.

I wanted to be able to transfer my own data, text and program files from the two machines - Scottstar Horizon and DEC VT102 - which I use at work.

As they were already communicating together using Kermit I decided to use it for general CP/M transfer. I've reconfigured for CP/M 3.0 - and so it could, by allowing a switchable at the beginning of the source.

With a little initial difficulty, such as having to remove certain files from the source, Kermit was assembled on the Horizon - CP/M 3.0 - and the text file sent to the Amstrad using Mac232.

After using Kermit on the PCW I had a version of Kermit which worked perfectly via the CPW 8224 module.

I can now transfer files at any rate between any of the computers to which I have access. - Sean S. Kelly, Birmingham.

Forces' favorites

I AM serving in HM Forces in West Germany, and for the past few months have been going to buy the PCW 8255 from a number of sources in the UK.

I have even written to Amstrad at Amerswood House to export a model direct. Unfortunately this has all been to no avail.

There are three difficulties - firstly because I am serving abroad I wish to get a model VAT free.

Secondly firms that I have contacted say they have no export facilities. Amstrad also said this. HM Forces are part of the British Forces Postal System, therefore I have a BFPO address. The use of this,

means it is exactly the same as packing merchandise in the UK, and for the same price.

Finally the majority of those who may supply great monitors, and I want a colour one.

Amstrad told me to buy a JumboView, which is an Amstrad in all but name. However it has a German keyboard - as opposed to GIBERTY's less OVERLY.

This and a number of other difficulties will apparently lead to problems in the use of British software.

You may think the easiest option would be to drive to the UK, buy a model - including a VAT - approximately £180 each - and bring it back.

But the cost of driving back 400 miles and a ferry ticket make this prohibitive.

A great model would cost me around £380. For that price I could buy a Commodore system, though I don't think it's of the same quality.

What is the best way of solving my problem?

Is there a supplier who can supply a colour monitor PCW 8255 system to a member of HM Forces in West Germany VAT free?

I know of many people who are buying Commodore systems because they can't get Amstrads. For someone with a head for business there is a tremendous opportunity here. - G. Walker, West Germany.

■ Let's cut the record straight - firstly neither the PCW 8238 nor the 8512 are available with a colour monitor.

It's not that the majority of dealers can only supply a monochrome monitor - I'm afraid it's a green screen or nothing since the monitor, CPU, circuitry and the chassis of the PCW are all housed in the same unit.

Secondly VAT is 18 per cent on an 8255 is about £60, not £180.

I take your point about not wishing to live a Schneider because of the German keyboard, which may indeed cause all kinds of problems for you.

Most of them can be

overcome with the CP/M German utility or with something like Carter's Smartkey. However you would have to re-label the keyboard accordingly, and dealing with the problem would be something of a hassle you could do without.

In any case you would have to buy a British version of LocalSoft because the keyboard cannot be reconfigured before loading the program, which unfortunately bypasses CP/M.

However, I cannot understand why you have had difficulty in getting a British dealer to send you an 8255.

I have contacted Dixons - the biggest UK supplier of PCWs - and they will happily dispatch a machine abroad via the post office.

The cost of postage to send a complete 8255 to a BFPO number in Germany - the total weight is 17 kilograms - is £18.00 airmail, and £4.40 surface mail.

On the other hand the VAT problem is, as far as it can make out, insoluble. Again I have checked with Customs and Excise. Nothing is absolutely clear - in some extent individual circumstances play a part.

However the overall view is that in order to avoid paying VAT you will have to come and collect the machine yourself in the relevant forms and give an assurance that it will be for your personal use in West Germany.

You might like to get in touch with British Customs and Excise yourself to make sure this information is correct, and that there really is no way round the problem.

But I suspect that in the end you will have to balance a trip to this country - is it perhaps worth making it coincide with a holiday? - against the £60 VAT you will otherwise almost certainly have to pay.

Should you manage to find a legal method of receiving a machine by post free at VAT, we would be glad to hear about it - as you say there is probably a large market for machines and software among HM Forces posted abroad.

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