July 24–30 1987 Vol 6 No 29 60p

# POPULAR Computing WEEKLY

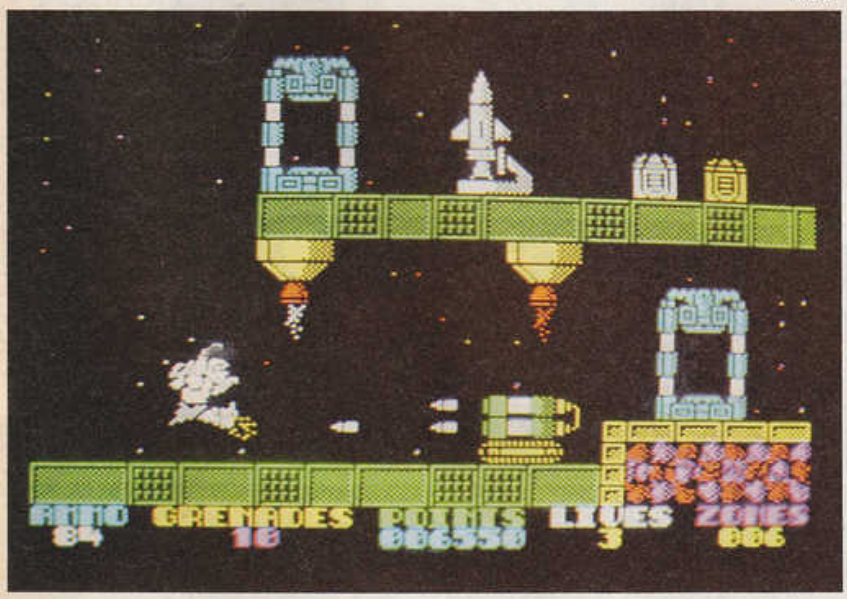
## GRAPHICS
Using colour in your computer art
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## HALL OF FAME
Hewson on form again with Exolon




Sunset by Paul McKinley

Exolon




## NEWS DESK
Creative Sparks in receivership

Prestel hackers win appeal

Amstrad unveils new PCW micro at US show

## CBM'S NEW BOSS SPEAKS OUT – p10

ATARI COMMODORE SPECTRUM

SPECTRUM COMMODORE AMSTRAD ATARI

AMSTRAD COMMODORE ATARI SPECTRUM

# N E W RELEASES




ROAD RUNNER

PAPERBOY

## WOOLWORTHS

*A Great Deal in Entertainment*

VISA

* At selected larger stores.

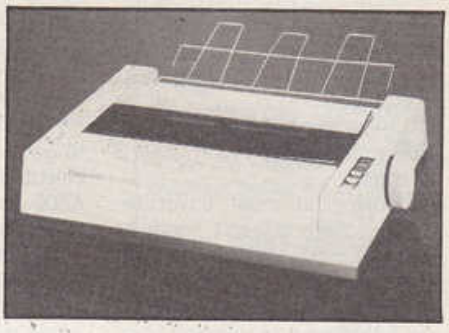
* Items subject to availability

COMMODORE SPECTRUM AMSTRAD

POPULAR Computing WEEKLY

# July 24–30

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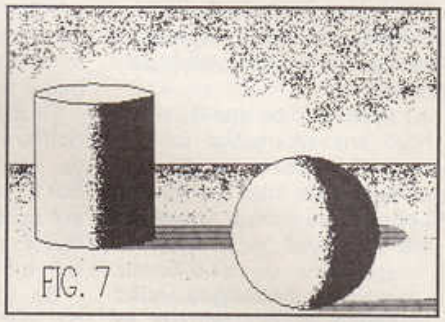
## News

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**31 Soundcheck** Mark Jenkins tracks down the new UMI music package for the BBC machines.

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*Top: Panasonic's KXP 1081 printer. Above: Paul McKinley offers more guidance on using graphics programs. Below: US Gold's Road Runner.*

## Features

**14 Panasonic KXP printer** Panasonic's KXP-1081 is a dot matrix model retailing for just under £200. Joe McGonagle found it suited his needs nicely.

**17 ABC business package** One of the latest of the cheap, or cheapish, PC compatible titles is *ABC*, an integrated suite of business software. Will this be the only software you need to buy for your PC? Tony Bridge reports.

## Programming

**20 Graphics packages – and how to get the best from them** This week, Paul McKinley looks at using colour, and colour effects with fill patterns to give impressive results in your own pictures.

**22 Listings** Into extra time with the final part of A Game of Two Halves, our football listing for the Spectrum. For Amstrad CPC owners, turning your machine code into resident system commands.

Corruption on the BBC helps you to recover those spoilt programs from tape and edit them, while Better Basic for the C16 gives you new commands, new variables and new functions. Finally, Options, for the ST, is a handy Atari ST Basic routine.

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## Games

**40 New Releases** Your complete guide to all the games released this week, including US Gold's prestige licensed game *Road Runner*, *Stationfall* from Infocom and *Dungeon*, also from US Gold.

**42 Hall of Fame** Hewson must be one of the most consistently excellent games companies around. *Exolon*, for the Spectrum, Commodore and Amstrad, has all the hallmarks of a quality Hewson release.

**Editor** Christina Erskine **News editor** John Brissenden **Features editor** Cliff Joseph **Technical editor** Duncan Evans **Production editor** Michelle Beauchamp **Marketing and Advertisement manager** David Osen **Advertisement executives** Jon Beales, Athena Peerman **Classified manager** Susannah King **Classified executive** Robert Cole **Editorial secretary** Annmarie Allan **Administration Assistant** Carol Frith **Credit control manager** Gabriella Piscina **Managing editor** Peter Worlock **Publishing director** Jenny Ireland. **Published by** Sunshine Publications Ltd, 12–13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Fax 01-439 0681 **Typeset by** Magazine Typesetters, 6 Parnell Court, East Portway, Andover, Hampshire. **Printed by** McCorquodale Magazines, Andover, Hampshire. **Distributed by** S M Distribution, London SW9, Tel 01-274 8611, Telex 261643.
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ABC

**How to submit articles** Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

**Popular Computing Weekly. Tel: 01-437 4343.**

# LETTERS

## Taking things seriously

Thank you for producing a magazine which takes its readers seriously, from a mere Plus 2 owner like myself, to the ST and Amiga enthusiasts continuously at each other's throats (I can't wait for the next instalment).

I have my eye on the future and intend to expand my Plus 2 system.

Looking at most advertisements, there doesn't seem to be much on Microdrive. With the Microdrive seemingly becoming a rare species, would it be a mistake to invest in Microdrives for use with my computer or would I be better off investing in hardware such as a Disciple interface and a compatible disc drive?

I would also be grateful if you have any information on any computing outlet which has produced an interface for the Spectrum to allow it to pick up teletext.

*G O Davies*
*Cardigan, Dyfed*

**Investing in Microdrives at this stage would definitely be a mistake. Microdrives do not figure in Amstrad's plans for the Spectrum.**

**However, a hardware expansion such as Rockfort's Disciple, or Multiface Two from Romantic Robot, could well prove useful. You can contact these companies on 01-203 0191 (Rockfort) or 01-200 8870 (Romantic Robot) for further details.**

**Try Volex Electronics (061-736 5822) for the teletext adaptor. Volex produces a range of teletext adaptors for a number of machines and should be able to point you in the right direction.**

## And on to the next round . . .

Trevor Monahan's letter (*Popular*, July 10) finishes by saying that he has put the record straight on the ST versus Amiga argument.

On the contrary, he has put it further off the truth than ever before.

The ST runs at 8MHz, not the 7.1MHz which Mr Monahan cites. The Amiga runs at 7.16MHz.

He states that the ST can only be expanded to one megabyte "after open heart surgery". However, the ST can be expanded to 4Mb. AS&T offers various upgrades to do the job.

On to pricing. Anyone who has paid £390 for a colour monitor is either blind, stupid or both. I personally bought a Philips 8533 medium resolution monitor for about £280 and that was four months ago.

Mr Monahan also states that to get an ST system with equivalent storage capacity to an A500 you would need to pay £540. This is ridiculous.

These days you can get a 520STM for about £255. If you add a double sided AS&T drive, which retails at £99, this comes to £355 – about £200 less than Mr Monahan's total. Double sided drives can now be formatted to more than 830K using various public domain offerings.

Finally, a user need not buy both a mono and a colour monitor. Medium resolution is difficult to read on your average TV, but quite suitable for word processing, spreadsheets, etc, with a monitor.

So, to finish, a fully working ST system with medium res colour monitor and 830K disc storage would cost about £635, not Mr Monahan's total of £929.85.

*Peter Baldwin*
*Maidenhead, Berks*

**This letter was written before news of the 520STFM's price cut to £299 was announced.**

## . . . and the next . . .

I was interested to read Mr D C Taylor's facts (?) about Amiga software. The facts being, according to Mr Taylor, that there will be plenty of software from the US soon, and reminding us that, apparently, US Gold turned the C64 into an overnight success.

It all sounds very like the early days of the Atari 800XL in this country. It, too, was a machine with unrivalled specifications, easily outperforming its nearest rival, the C64. It had lots of software in the States, more than the C64, and was supported by US Gold.

Despite these factors, we all know which machine went on to become the million seller. And all that American Atari software? Most of it stayed there. Home grown support is the one deciding factor in the fate of a micro, and the ST has got plenty of that!

Most British software houses are already writing for the ST or looking for ST programmers. Only a handful are willing to "test the water" with the Amiga. The software gap is already huge and getting wider every day.

"But", cry the Amigans, "the Amiga is technologically superior to the ST!" True. No-one disputes that. But the ST represents to the average home user a peak of technological excellence beyond which it is not necessary, or affordable, to go.

Most home users will probably never use the power of the ST to its full potential, so why spend around £150 more on an even higher specification machine?

The ST is the right price and offers everything you could possibly want.

*P A Ioannou*
*Halifax*

## . . . but then again, who cares?

Just thought I would like to keep the Amiga/ST debate simmering by adding a few observations of my own.

Neither machine is actually poor, but both are flawed. Both machines have effectively failed to crack the IBM/MSDOS hold on the business sector, though the ST may have achieved this in West Germany. Ironically, both machines suffer, heavily, from the fact that their latest incarnations are the machines that should have been produced first time round.

The Amiga does have, beyond any doubt, the better graphics and sound hardware. It is, however, still way overpriced and aimed at the wrong market. Its custom chips designer is on record as saying he wanted to create the ultimate games console, and never intended the business machine it was later marketed as.

For a supposed business machine the hi-res display is very important, I can sit all day in front of the ST's mono monitor but I wouldn't do that with the shimmering, flickering Amiga's (or the Atari's colour monitor for that matter!).

If I want to draw pictures, in colour, I would use the Amiga/*Deluxe Paint* combination. If I want to draw black and white line drawings, for hard copy, then I would use ST/*Easy Draw* or *GFA Draft*. For word processing, there's no contest, *First Word Plus* on the ST, with a possible final print by *Signum*.

When it comes to heavy duty business applications, I simply couldn't use either of them. The software just doesn't exist. All you can do is find the fastest IBM compatible you can afford, and be prepared to be amazed at how slowly it runs.

The bottom line is, almost certainly, that if you've already bought one of them, it's not worth selling it to get the other. Both will do most things better than just about anything else on the market (with appropriate apologies to Mac II and Acorn Archimedes owners).

One final burst of deep, meaningful insight: who really cares anyway?

*Mark Annetts*
*Richmond, Surrey*

## Accolades to Archimedes

I am writing with reference to the 'attack' on Acorn's new Archimedes micro by RML and the BMF.

Whilst I concur with their viewpoint on lack of 'instant' MSDOS compatibility, they must agree that although this system is an industry standard, it is now outdated and in need of replacement. Maybe the Archimedes can fulfil this requirement?

The Archimedes is not only a 32-bit machine, but a revolutionary design concept in the way of the Reduced Instruction Set. This enables the micro to operate at a much higher IPS rate, therefore pushing the frontiers of speed on an 'affordable' home micro forward.

Coupled with the above, the graphic capabilities are far better than the standard IBM colour graphics, having 18 screen modes, up to 640 by 512 pixels if the multisync is fitted, and a pallette of 4096 colours. Admittedly these capabilities are not the 'ultimate' in computer graphics (this being the much sought after 4096 by 4096 pixels), but it's getting there.

The Archimedes machine has, in a nutshell, created a new standard which far exceeds that of IBM PC, and I envisage that many small to medium (and large) businesses will be using this machine by next July.

If they also wish to run any of the ageing MSDOS standard software, then Acorn will be producing an 80186 coprocessor as an add on unit, but this can be compared to driving a performance car with the handbrake on!

*Chris Rudge*
*Fareham, Hants*

## Getting the competition

I would like to inform your readers of a new newsletter due out at the end of August, totally devoted to competitions, hi-scores, reviews and opinion polls.

For free information please send an SAE to me at 1 Sunnybank Street, Ossett, Wakefield, W Yorks WF5 8PE.

*Robert White*
*Wakefield*

## A tiresome feature

I share Mr Wilson's enthusiasm for the MTX512 (Letters, June 26), but the clearance of variable every time a Basic line is entered or amended is, to my mind, a tiresome feature. If any of your readers can tell me how to prevent it I would be grateful.

Nevertheless, I look forward to further MTX programs from Mr Wilson for any other MTX experts out there.

How about an indexing program with machine code sort facility along the lines of Alan Went's program for the Spectrum published in *Popular*, September 13, 1984? My own efforts to convert it for the MTX have so far proved unsuccessful.

*I S Colston*
*Bideford, Devon*

## The best in radio information

In reply to Chris Smales' letter (*Popular*, July 3) on Radio Teletype (RTTY), the best source of information on the subject is the British Amateur Radio Teleprinter Group (BARTG).

Membership of this organisation is currently £7 per year and includes all four issues of Datacom, their quarterly publication. Datacom contains many articles of information on RTTY as well as a number of adverts for various bits and pieces of equipment as well as software for a variety of computers. The membership Secretary is Mrs Pat Beedie GW6MOJ, Ffynnonlas, Salem, Llandeilo, Wales SA19 7NP.

BARTG also publishes an excellent introductory pamphlet for anyone wishing to consider this means of communication. This is *RTTY the Easy Way* and is available from them for £2.75 (non-members price).

Please note that it is necessary that anyone wishing to use RTTY for personal communication *must* have an amateur radio licence. Source of general amateur radio information is the RSGB whose address you mentioned in your reply.

*Marvin G Wallis, GDCRD*
*East Sussex*




*"When we bought Mikrogen we should never have agreed to give Wally Week a seat on the board"*

## Waiting for Sir Clive

I was very interested in last week's *Popular Computing* to read an article condemning Sir Clive Sinclair (of Spectrum fame) in the pre-advertising of his new portable computer.

I think this to be personally very unfair as it is common practice throughout the rest of the industry. I own a C64 and have longed for a piece of software relating to desktop publishing. I eventually saw one in a Commodore magazine and proceeded to hunt down this precious program. Although that was in October of last year I have yet to track it down, but alas in February of this year I came across another advert for the same type of software which I now learn, due to your magazine, will not be released till August.

Spare a thought for poor Sir Clive as he spends pounds trying to get his brain-child onto the market, as I spend them also trying to find things which are supposedly on the market.

*Ewen Anderson*
*Perth*

## Amstrad CPC user's club

I am starting up a user's club for Amstrad CPC owners, and would like to take this opportunity to explain some of the services I offer.

Firstly, there will be a club magazine and a sheet containing new releases for the CPCs, every three months.

I shall also be running a PBM game using the War Hammer Fantasy Battle rules. Also available is a pen-pal service, adventure tips, etc.

For full details send an SAE to me at 7 Robinson Way, Bangor, Co Down, Northern Ireland BT19 2NR.

*David Phillips*
*Bangor*

## Correction to Handycalc

In part one of D Green's Handycalc program for the C64, the following lines were inadvertently left out:

```
121 DATA0,0,0,0,0,0
,0,0,0,0,0,0,0,0
122 DATA0,0,0,0,0,0
,0,0,0,0,0,0,0,0
123 DATA0,0,0,0,0,0
,0,0,0,0,0,0,0,0
124 DATA0,0,0,0,0,0
,0,0,0,0,0,0,0,0
125 DATA173,191,198
,208,47,174,192
126 DATA198,224,0,2
08,3,32,166,195
```

We're sorry but *Popular Computing Weekly* cannot guarantee to reply to *all* letters requesting a personal answer. It helps us enormously if readers are prepared to have general queries answered on these pages, so, if possible, please do not send SAEs.

# A minor exchange

In Game One of our readers' versus *Colossus* chess tournament, the readers (playing black) have chosen to exchange minor pieces, giving up the bishop pair, but leaving the centre files wide open for their rooks to counter attack (see diagram below for details).

## Your next move

How do you think the readers should continue the attack?

Send your suggested move to *either* Inter-Mediates (*Popular* Chess), Freepost, Sawbridgeworth, Herts CM21 9YA (no stamp needed), *or* Popular Chess, Unit 2, The Maltings, Sawbridgeworth, Herts CM21 0PG (with a stamp).

Only one vote per person please, and all entries must reach either address by Wednesday, July 29.

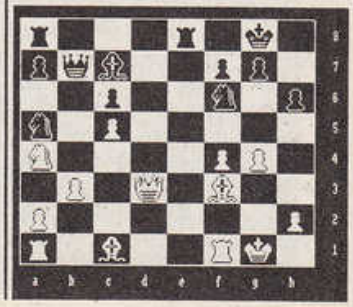
The move which gets the most votes will be entered into the game. Results and *Colossus*'s response will be published in two weeks' time.

Next week, we return to Game Two, where the readers are playing white.

## Game One

**The moves so far:**

| | | |
|---|---|---|
| 1 | Pe2-e4 | Pc7-c5 |
| 2 | Ng1-f3 | Nb8-c6 |
| 3 | Bf1-c4 | Ng8-f6 |
| 4 | Nf3-g5 | Pd7-d5 |
| 5 | Pe4xd5 | Nc6-a5 |
| 6 | Bc4-b5+ | Pc7-c6 |
| 7 | Pd5xc6 | Pb7xc6 |
| 8 | Bb5-e2 | Ph7-h6 |
| 9 | Ng5-f3 | Pe5-e4 |
| 10 | Nf3-e5 | Bf8-d6 |
| 11 | Pd2-d4 | Pe4-d3 (en passant) |
| 12 | Ne5xd3 | Qd8-c7 |
| 13 | Nb1-c3 | Ke8-g8 o-o |
| 14 | Pf2-f4 | Qc7-b6 |
| 15 | Nc3-a4 | Qb6-d4 |
| 16 | Pc2-c3 | Qd4-d5 |
| 17 | Ke1-g1 (o-o) | Rf8-e8 |
| 18 | Be2-f3 | Qd5-b5 |
| 19 | Pb2-b3 | Bc8-f5 |
| 20 | Pc3-c4 | Qb5-b7 |
| 21 | Pc4-c5 | Bd6-c7 |
| 22 | Pg2-g4 | Bf5xd3 |
| 23 | Qd1xd3 | ? |



## Investigation into AIR continues

TRADING Standards officers in Kingston are continuing their investigation into the affairs of AIR – Ahmed Innovations and Research (see *Popular Computing Weekly*, July 3).

AIR was promoting a number of products earlier this year, including an ST emulator for the Amiga, called the *STimulator*, and a 68010 chip for the Amiga machines.

While it now appears that few, if any, *STimulators* were delivered to mail order customers, several have reported to have received their replacement chips.

Mr Forsyth of Kingston Trading Standards Authority would be pleased to hear from anyone who has problems with AIR. Contact him at Guildhall, Kingston Upon Thames, KT1 1EU.

## Modem House: one complaint cleared

THE fall-out from the disputes between the now defunct Modem House and other modem manufacturers continues, some five months after the event.

Devon CID were called in to investigate two complaints, one made by Modem House director Keith Rose about thefts from the company, and a second made against Rose himself.

The inquiry into the complaint against Rose is now complete and no criminal proceedings will be undertaken. However, the inquiry instigated by Rose's allegations is still continuing.

Keith Rose himself is now working for a company involved in a "confidential communications project".

## Correction

In News Desk, July 17, we printed an article headed "Music 7000 confusion resolved", which actually did little to resolve the confusion.

We would like to make it clear that the Music 7000 is a completely independent product; it is not based on Hybrid Technology's Music 5000, and has nothing to do with Hybrid Technology's Music System.

# Receiver called in at Creative Sparks

CDS, the company incorporating Creative Sparks software and distribution, Sparklers, Status Software and Mikrogen, has called in the receiver.

CSD asked chartered accountancy firm Robson Rhodes to act as receiver for the company. Neil Cooper, of RR, has been appointed receiver and a statement of the company's affairs is currently being drawn up. A creditors' meeting will be called within three months. The receiver hopes to be able to sell the company as a going concern, although no firm offers have currently been made. Debts have been estimated at between £750,000 and £1.5 million.

The effects of CSD's crash will be felt throughout the industry, since its distribution division numbered multiple retailer Boots among its customers. Thus many software houses which sold its products to Boots via CSD are owed money by the company. Two thirds of Boots' business is held by wholesaler Centresoft, part of the US Gold/Ocean group, and it is understood that Centresoft is taking on CSD's portion, at least for the moment.




**Sparklers software: part of CSD's wide range of activities**

CSD was originally part of the electronics giant Thorn EMI until a management buy-out in 1985 set the company up on its own. It is thought that a substantial amount of the company's debts, said to be around £750,000, are owed to Thorn EMI.

After the buy-out, CSD launched the Sparklers range of budget software and planned to publish business packages this year. Last December, CSD acquired Mikrogen, the games company best known for its Wally Week series.

## WH Smith announces bundled DTP system

W H SMITH has announced an extensive new desktop system that will be sold in a number of its stores this summer.

The package consists of an Amstrad PCW8256, bundled with *The Desktop Publisher* (a new suite of programs from Database Software) and an AMX mouse with interface.

This is priced at £499.95 including VAT, compared to a retail price of almost £570 if each item were bought individually.

*The Desktop Publisher*, from Database, includes page editor, graphics editor and text editor programs, as well as a library of graphics and additional fonts, and is available separately for £29.95.

## More Ram for the Amiga

IF 512K isn't enough Ram for your Amiga, Robtek has produced a two megabyte Ram Expansion Box which is available this week.

Designed primarily for use with the A1000, the Expansion Box can also be used with the A500 with an interface which Robtek can also supply.

The Expansion Box retails for £490, with the A500 interface costing a further £19.95.

Further details from Robtek on 01-847 1457.

## Profits at Micropro

MICROPRO, publisher of the *Wordstar* series, has announced increased profits for the company's third quarter ending May 31.

Turnover increased from $6.9m (£4.3m) in the corresponding period a year ago to $11.4m (£7.1m) this year. Profits rose to $1.5m (£969,000) compared to a loss in last year's third quarter of £2.4m (£1.5m).

This is the fourth successive quarter in which Micropro has recorded a profit.

## AMSTRAD FORMS SUBSIDIARY COMPANY IN ITALY

ALAN Sugar's Amstrad empire spreads further afield this week with the formation of a new Italian subsidiary.

Headed by Ettore Accenti, Amstrad Spa will be located in Milan and wholly staffed by Italian nationals.

The move is a first for Amstrad, which has hitherto subcontracted distributors to handle its products overseas.

Amstrad has been particularly successful in France, where CPC machines were at one time, accounting for over 50 per cent of micros sold, and in Germany, where its machines are sold and badged by Schneider.

It is estimated that the Italian computer market, including business, leisure and educational uses, represents possible sales of around 600,000 units. However, Amstrad Spa will be marketing all Amstrad product ranges, including audio and video hardware in addition to computers and peripherals.

# Prestel hackers win appeal

THE 'Prestel hackers' have had their convictions under the 1981 Forgery and Counterfeiting Act quashed by the Court of Appeal.

Steve Gold and Robert Schifreen were found guilty in April 1986 of 'making a false instrument' to gain entry to Prestel mailboxes including that of the Duke of Edinburgh (reported in *Popular*, May 1, 1986). They were fined £600 and £750 respectively and ordered to pay £1,000 costs.



**Gold: buying champagne**

The pair appealed on the grounds that a "false instrument" had not been clearly defined or identified during the trial.

It appeared then that the electronic impulses sent down the telephone line, after entering the 'hacked' passwords were being identified as the false instrument.

The Lord Chief Justice, Lord Lane, speaking for the three appeal judges, said that it had been forgery, it was of an unusual form.

Gold and Schifreen's fines and costs payments have both been set aside.

"We appeared in court at 10.00 last Friday (July 17), and by 10.30 we were looking for somewhere to buy champage," commented Steve Gold.

However, it is understood that British Telecom, which brought the charges against the pair, is considering a further appeal to the House of Lords.

# Incentive pioneers new games technique

INCENTIVE Software has announced its first completely new product since the release of *Graphic Adventure Creator* in 1985.

*Driller* will be released this October, and is the first game designed using Incentive's new Freescape system, which the company has been developing for the past year.

Freescape allows the programmer to create a solid, three dimensional environment drawn with shaded wire frame graphics, within which the player can move freely, manipulating objects and observing structures from any angle.

Incentive's Ian Andrew claimed, "We hope it will, if not set an industry standard, then at least raise the standards of this type of game higher."

Freescape and *Driller* are being currently developed for Spectrum, C64 and Amstrad CPCs, with the eventual aim of conversion onto the Amiga and ST.

*Driller* will be previewed at the PCW show prior to its release, but Andrew would not reveal any details of the game at the moment.

# Amstrad PC modem gets all the Kudos

A NEW low cost modem for the Amstrad PC range has just been given BT approval.

The Stradcom is a full V21–V22 modem with Hayes compatibility produced by Kudos Systems for £159 (plus VAT).

Kudos also produces the KudosCard, a 30 megabyte hard disc drive for most IBM compatibles.

Kudos can be contacted at 01-200 6511.

# SOFTWARE HOTLINES

I am not going to mention Mastertronic this week.

Instead, I went off to see **Martech** having its *Crazy Comets* sequel, *Mega-Apocalypse*, tested by hordes of crazed arcade fans.

*Mega-Apocalypse* is in much the same mould as its highly addictive predecessor, being a frantic space shoot 'em up in which your space ship is bombarded by wave after wave of asteroids, comets and the like except that now it's a two player game.

There is even more interplanetary junk to contend with, and the throbbing Rob Hubbard soundtrack throbs even more noisily than before.

There's been a sudden burst of activity over at **Gremlin,** with several new titles in various stages of completion. *Re-Bounder* and *Convoy Raider* are ready for release right now.

*Re-Bounder* is the sequel to their recent bouncing ball game, *Bounder*, and is more of the same, but with many more obstacles and traps, and this time around the ball is armed and ready to fight back.

*Convoy Raider* is less arcadey than Gremlin's usual efforts, a war-game in which you have to protect your coastline from enemy attack.

Also due in about a month are *Coconut Capers* and *Death Wish 3* (see below). *Coconut Capers* features the return of *Jack The Nipper* as he is let loose in the jungle, and of course *Death Wish 3* is based on the Charles Bronson film in which he plays a gun totin' vigilante who takes to the streets and kills everything in sight.

Presumably this will be a shoot 'em up rather than an adventure.

Gremlin says that the game will feature "incredibly lifelike animation" which, when you think about Charles Bronson's acting, isn't really saying a lot.

**Starlight Software** is working on a couple of new games which sound similar but aren't.

*Hybrid* is a futuristic game that sounds like a cross between Ocean's *Head Over Heels*, and the Transformers range of toys.

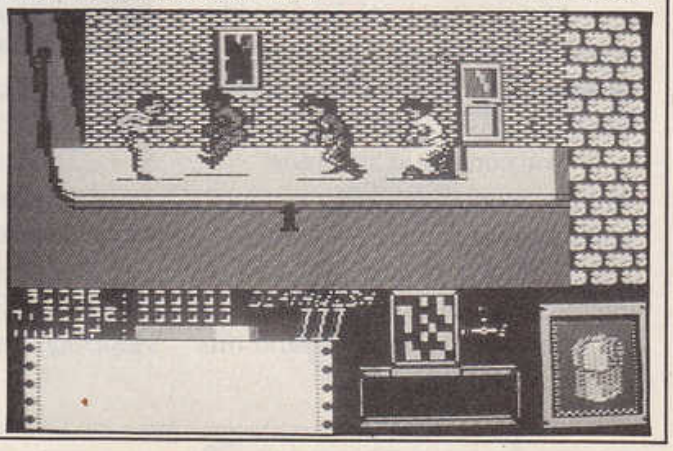


**The real Charles Bronson (above), and the computer game (below – or is it the other way around?)**

You control three androids which have to battle their way through an alien complex and then join together to form one big super droid.

*Red LED* on the other hand is more like *Marble Madness*, except that you control three robots with different abilities in an attempt to find a safe route across the landscape.

**Cliff Joseph**



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sound effects.

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It can speak back anything you care to write on the keyboard.

So this is one computer that can not only word process with faultless professionalism, and incorporate superlative graphics into the text, it can also read the text back to you aloud.

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The new Amiga 500, in fact, dumbfounds its competitors in every way.

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Yet the same technology allows the Amiga 500 to play games so mind bending that only full-scale arcade machines have been able to play them until now.

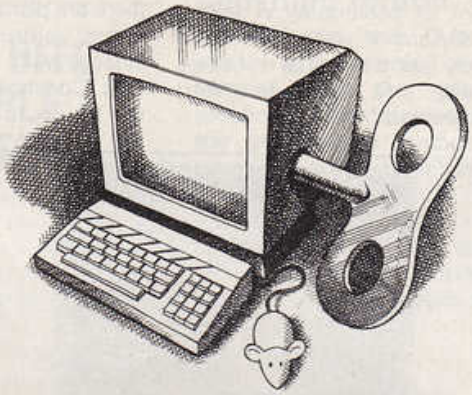
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AMIGA

Commodore

*Popular Computing Weekly*, 22-28 May 1987. †*Personal Computer World*, February 1987. ***Subject to availability.*

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# Putting Commodore back on the map

## Commodore UK's new managing director, Steve Franklin, talks to Christina Erskine about his plans for the company

THE last 18 months or so have been turbulent ones for Commodore International. An appalling series of financial results nearly sent the company to the brink of bankruptcy in spring 1986, and it was only hauled back into profit after a severe staff and cost cutting programme.




**Amiga 500: "the ultimate in home computing"**

This year, too, has seen its comings and goings, with Commodore International's chief executive Tom Rattigan being forcibly removed from the company's Pennsylvania headquarters and the UK division's head, Chris Kaday, making a sudden departure last March.

Kaday's place has been taken by Steve Franklin, who spent 11 years at Rank Xerox before heading up the sales and marketing team at Granada Business Centres for three years until a couple of months ago.

He's now arrived at Commodore UK to "put Commodore back on the map".

Despite Franklin's desire to move Commodore back into a strong position in the business market – an area it excelled in, alongside Apple and Tandy, in the late seventies with the PET machines and a natural priority for one with his track record, there are plans afoot too for the home micros. Franklin is pleased with the range of micros Commodore offers, from the 64 up to the IBM PC AT clone, the PC 40/20, and Amiga 2000.

He sees the four-year-old Commodore 64 continuing as an entry-level machine for some time. "There's a huge market in the 64. I still believe that for the young home computer buyer who wants a fairly good games machine then the Commodore 64 is the best buy, a) because of its price and b) because of the software base."

That's all very well, and the strength of Commodore's software base is undeniable, but Atari's STFM will cost £299 in September, and the equivalent set-up on the Commodore 64 (cpu plus disc drive) is hardly competitive at £388 (£189 for a 64C, £189 for a 1541 drive).

Franklin's reply is guarded. "I think you will see, come September, some very attractive buys on the C64."

He wouldn't comment in detail on new 'compendia', as the 64 has been packaged for the last year or so. "We are in negotiations with retailers now and we will have something this year."

A price cut (or realignment, adjustment, whatever you care to term it) does look on the cards, however. Franklin went on to assert that the Commodore 64 was viable for a good while to come as an entry machine.

"There is always a market for the first-time buyer – the kids never stop coming. But it depends on the price. It's parents, generally, who buy these machines, and they want something that is not too expensive.

"I believe that all children at a certain age should be made computer aware. The Commodore 64 is ideal for this – it's easy to use and there are good games out for it."

Franklin is much less assertive about the 128 machines, and distinctly cagey about their longevity in the market.

"Yes, they have a future. They don't sell too badly, though not as well as the 64 or potentially the Amiga. We're still offering both the 128 and 128D, although compared with other 128K machines, there is a question as to whether they're competitive."

However, he perks up at mention of the Amiga.

"The Amiga 500 is the next product up for long-term Commodore 64 users. The A500 is a very powerful home computer; the games are more sophisticated and the power lends itself to serious use.

"We will be doing something about the upgrade path to the A500. There will be an incentive for Commodore owners to upgrade if they want to at the end of this month. Perhaps an incentive to get a monitor as well."

Further than this Franklin would not go, but it sounds like some kind of trade-in offer to me.

Comparing the attractiveness of the ST and Commodore 64 in their current states is one thing; but Franklin is more wary of comparison of the ST range with the Amigas.

"One has to ask the question, why do Atari have to cut their price again by £100?

"I will never get into a price war. It's bad for the industry, bad for the dealers and ultimately it's bad for the end users, because if companies keep cutting their prices, then something will have to give, and at the end of the day, that something will be quality.

"But I will say that we will price competitively. I am aware of price points, but I'll never say that we'll be the cheapest – we don't need to be.

"I'm aware that Atari will drop prices, and we aren't so arrogant as to just sit here. We'll be competitive, but there is a premium which people will pay to have an Amiga."

Franklin's first moves at Commodore UK, however, have been reshaping the profile of its business machines.

"Commodore understands the importance of the consumer market and needs to get back into a position where it can dominate it. However, if Commodore wants to be a major player in computing, it needs to get into the business system field."

One of Franklin's first initiatives in the six weeks he's been in the job has been to effectively split Commodore UK into two

**continued on page 11 ▶**

# Amstrad's new PCW9512 on show this week in US

AMSTRAD'S new PCW machine, the 9512 (see *Popular Computing Weekly*, May 29) is being unveiled this week at an office equipment exhibition in Atlanta, USA.

It will be the third time Amstrad has launched in the States, rather than the UK; the CPC6128 and PC1640 also made their debuts Stateside.

A spokesman for Amstrad said, "We are simply displaying one or two prototypes in the hope of attracting some office equipment dealers out there."

The PCW9512 is understood to be an enhanced version of current PCWs, rather than a completely new machine. It is expected to have a full Centronics printer port, for easy interface with printers other than its dedicated model, which will probably be a dot matrix model with a full letter quality mode, although there have been reports of a daisywheel model.

The screen display and keyboard have been improved, and the new 9512 should have *Locoscript 2* bundled with it.

It is expected to be shown first in the UK at the *PCW* Show and to sell for £499 (plus VAT), the same price as the current PCW8512. Price cuts cannot be ruled out for the PCWs 8256 and 8512, to £299 and £399 (plus VAT) respectively.

However, Amstrad's spokesman would not confirm details of a UK launch. "Obviously, we have to be able to respond to the market place," he said.

## Evesham upgrades C64 drive

EVESHAM Micros has produced an upgraded version of its Excelerator disc drive for the Commodore 64 in an attempt to overtake sales of Commodore's own drive for the machine.



Priced at £159.95 the Excelerator is some £30 cheaper than Commodore's 1541 disc drive, and Evesham hopes that as it is "both smaller and neater than the Commodore drive" its model will be an attractive purchase for new buyers.

After delays caused by a Customs dispute, Evesham claims Excelerator is now freely available and the company is aiming for sales of 5,000 units a month.

More details from Evesham Micros on 0386 41989.

## BIGGER BITE FOR APPLE COMPUTER

APPLE Computer has announced increased turnover and profits for the quarter ended June 26, 1987.

Sales reached $637.1 million (£398.2m) this year, compared with $448.3m (£280.2m) for the same period last year. Profits rose to $53.5m (£33.4m).

Apple's chairman John Sculley commented: "These results are more evidence that Apple is doing well. Acceptance for our new Macintosh computer is high."

## Putting Commodore back on the map

◀ continued from page 10

entirely separate divisions; "they'll almost operate like two different companies".

One side will deal with the consumer products, the other is a new section for Commodore UK, set up to try to push the company back into the corporate market with its new PC40/40 IBM AT clone and the Amiga 2000. "It will be difficult, but we need to do it."

He has recruited staff to sell to the corporate market, bringing the total at its Maidenhead office to just over 40.

Obviously, though, the sections will overlap in some areas. "There is a grey area between the two divisions, where products apply to both," Franklin said. "The Amiga 500, which we see as the ultimate in home computing, might well sell to companies who want a model for their executives to use personally because of its compatibility with the A2000 model.

"Corporate buyers might also want the PC10, PC20 and PC40/20 machines as cheap workstations."

The PCs currently rate as 'consumer products', and Commodore UK, under Franklin, has recently cut the price to more nearly reflect the cost of other 'home' PC clones (see *Popular Computing Weekly*, July 17).

"The serious home user wants a 'serious use' machine, probably with MSDOS compatibility, and some smaller companies do buy from the high street.

"At the moment, the choice is Amstrad, Amstrad, or Amstrad. Now, while we are a competitor, we don't want to start a war with Amstrad, we simply want to provide an alternative."

Restoring faith in Commodore and "putting Commodore UK back on the map", particularly in the business areas, will not be easy.

The desire to avoid a price war is understandable, but standing between Alan Sugar and Jack Tramiel is to place yourself squarely in the combat zone.

It will be interesting to see how well Commodore can raise its profile without getting its head shot off.

## COMING SOON

### Graphics

**Paul McKinley brings you his final article on getting the most of computer art programs next week.**

**To round up the series, Paul looks at creating complex pictures using square, circle and triangle functions, and gives the some tips on perhaps the hardest subject of all, drawing human faces.**

### Copyright reform

**Tucked into the Queen's speech at the opening of parliament after the general election was a statement that the government intends to introduce a bill to "reform the law of copyright".**

**Along with rumours of a levy being placed on blank tape sales, Christina Erskine looks at the implications of further legislation.**

### Desktop publishing

**We look at this increasingly popular topic in depth: what you can and cannot produce with a home micro, what equipment you need to produce your own newsletters – and some alternatives – and the foremost packages on the market.**

### Games consoles compared

**After a six year lull, games consoles are on the way back, or they will be if Atari, Mattel/Nintendo and Mastertronic/Sega have anything to do with it. We compare and contrast the three models coming out this year.**

### Archimedes

**Acorn's new wonder machine has captured the imagination of those who thought sophisticated computer was due to be carved up between the Amiga and IBM's new OS/2 standard. We'll have a full review in a couple of weeks' time.**

commodore

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**Acorn's Archimedes: subject of a row between the BMF and Acorn over its endorsement by the BBC**

# Micros in schools: a misguided policy?

Criticism of the BBC's endorsement of Acorn's Archimedes raises questions about the role of computers in education. Peter Worlock argues that educational computing has got its priorities wrong

IF the current row between the British Micro Computer Federation, Acorn and the BBC does nothing more than open up a new debate on computer education, it will perform a valuable service.

At first sight the points at issue look muddled, covering as they do a range of questions including the role of the BBC in education, the principle of the BBC endorsing any product, and the nature of the use of computers in schools.

However, I can't be alone in thinking that the latter question is the only one that counts at this stage.

There's no such thing as being "a little bit pregnant", and the BBC could never be "a little bit" sullied by commercialism.

In any case that argument became less than academic nearly five years ago. Once the BBC had decided to launch its computer literacy project, and to endorse one computer for the purposes of that project, there was no going back.

It is also pointless to carry on rehashing the old arguments about whether Acorn should have received the Midas touch in the first place.

What is an issue is whether it should have endorsed the Archimedes, and that is only an issue in the wider context of computer literacy in Britain, particularly in schools.

The fundamental question is this: what is the point of putting computers into schools?

The Department of Education and Science offers a number of justifications, but before we get to that, think about the basic question again.

Everyone talks as though having a computer in every school was a good thing. The obvious argument is that one computer is better than none, but is it really? Why isn't it worse, given that the millions spent on computers could have been spent on more teachers, more books, more school trips abroad, or to museums?

The DES says that computers are currently being used in three areas in schools: first, in teaching computer use, what the BBC calls "computer literacy"; second, peripherally in the teaching of microelectronics; third, as a general purpose teaching tool.

The government is currently offering a further £19 million to schools for spending on computers, representing 70 per cent of a total spend, with Local Education Authorities topping up the remaining 30 per cent. This represents a new funding of some £28 million.

The government wants LEAs to spend this on the third area of computer education – using computers as teaching tools.

This is lunacy.

For a computer to be an effective teaching tool requires two things: first, a wealth of high quality educational software; and second, to have a computer on every desk.

We currently have neither, and anyone who thinks either is achievable soon is living a fantasy. That £28 million represents something like 55,000 Atari STs or Amstrad PC1512s, or 28,000 Archimedes.

It also represents something like one or two million textbooks, which sounds like a better deal to me.

The argument put forward by the BBC for the Archimedes is that BBC Basic is now an educational standard and it would be unthinkable to abandon it now. But, if BBC Basic is so important, why has the Beeb not released versions to run on other hardware and under other operating systems?

Moreover, is this really the heart of computer education in Britain: to turn out generations of Basic programmers?

All of this is mere obfuscation. Computers are not a general panacea. They are a tool, in the way that a typewriter, or a telephone, or a photocopier is a tool. The ability to use a word processor is no more essential today than was the ability to use a typewriter ten years ago.

Computers have a place in education, but only as a subject in their own right, until a computer becomes standard issue equipment, like an exercise book, a pen and a desk.

Computers belong in computer science classes, or in business studies classes running word processors, databases and spreadsheets. For the present, and into the foreseeable future, they have no real place in English, history, geography or language classes.

So where does that leave the Archimedes? The importance of Acorn's new machine is in its advanced technology, and that surely confines it to the computer departments of higher education centres – universities, polytechnics, colleges, but not in secondary schools.

If the BBC wants to take its computer literacy project in that direction, fine. But it could spare us the blather about standards in BBC Basic.

And if the BMF wants to fight the good fight for computers in education, it might start with the fundamental issues, rather than getting itself sidetracked in pointless disputes about BBC Basic and MSDOS.

# Panasonic printer gives value for money

A printer is often the first major peripheral bought by computer owners. Joe McGonagle found that Panasonic's KXP-1081 dot matrix model suited his needs

As the price of printers falls, so the expectations of computer users rise. These days, one is looking not only for decent print quality, in both draft and near letter quality modes, without a trade-off in speed, but also for a variety of print types (bold, underlined, italic, etc), the ability to tractor feed and take single sheets of paper, and a decent sized printer buffer to store downloaded information.

The quality of print from dot matrix printers is improving all the time, and is one of the factors that attracted me to the Panasonic KXP-1081 model (that and the price!).

This model operates on a matrix of 9 × 9 pins in draft quality. 18 × 18 in NLQ mode. It will also give you dot graphics. As you can see from the samples, the results are pleasing. Most stores are selling it for around the £200 mark, a bit less than the manufacturer's recommended retail price of £245. I got mine at £189.95 from Viglen Computer Supplies.

It is compatible with most popular micros, having a built-in seven or eight bit Centronics parallel interface. A serial interface is also available, but as an optional extra. Note that you will need to buy your printer/micro cable as well.

The printer itself is attractive in appearance, finished in a two-tone cream and grey. Using these colours means it is likely to blend in fairly well with the rest of your computer set-up.

Its controls are readily accessible, comprising a friction/tractor feed switch, the draft/NLQ/compressed print mode switch, an on-line switch, form-feed and line-feed switches, and, of course, the power off-on switch. These are all placed on the top of the machine, to the left and right of the casing.

The print quality, as mentioned above, is impressive. Even in draft mode it is easily readable, while the NLQ mode is better than all other sub-£250 printers I have seen.

## Speed

Manufacturers' estimates of print speed are notoriously optimistic, and with the KXP, no exception has been made. The quotes made for print speeds are 120cps (characters per second) in draft mode, and 25cps in NLQ.

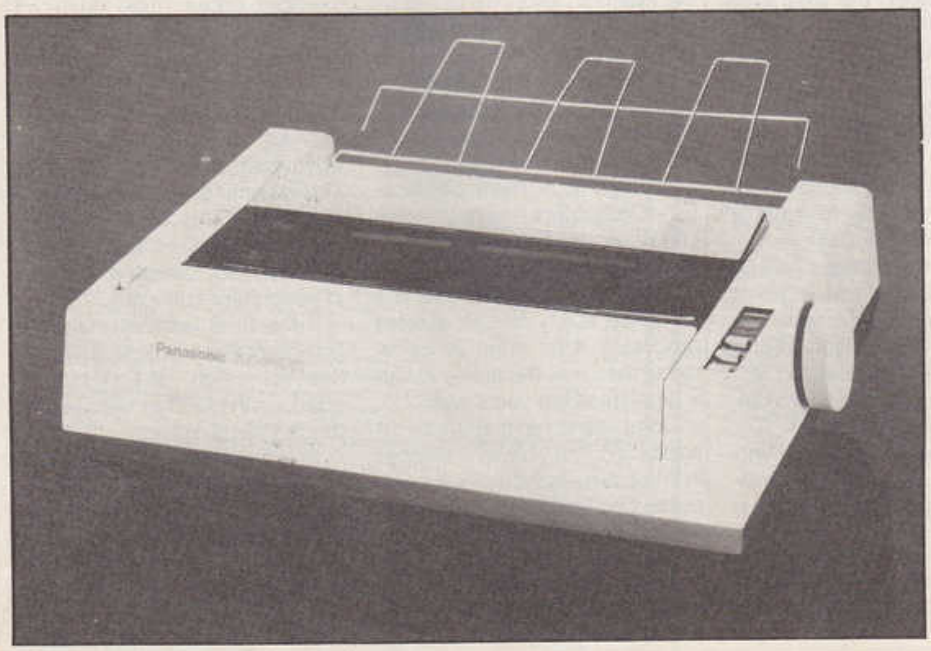
I output several rows of 'm's, which I reckoned to be a fairly 'testing' character to choose, and came up with an average figure of around 50cps. Quite a difference, but 50cps is more than adequate for most purposes.

The same test carried out in NLQ mode, however, produced much the same result as the manufacturer's specification, around 25cps.

The printer buffer on the KXP is only 1K. While this is undeniably useful, releasing the computer for other tasks when outputting small amounts of text, it's a shame that this buffer space isn't bigger, given the low cost of memory chips these days.

## Conclusion

The KXP-1081 represents excellent value for money, outperforming most dot matrix printers at under £300, while the KXP itself costs under £200.



### Panasonic KXP-1081 specifications

| | |
|---|---|
| **Resolution** | 9×9 (draught) 18x18 (NLQ) |
| **Interface** | Parallel Centronics (7 or 8 bit) (fitted) Serial (optional extra) |
| **Print modes** | Draught, NLQ, dot graphics |
| **Print speed** | Draught 120 CPS (quoted) 50 CPS (see text) NLQ 25 CPS (quoted) 25 CPS (see text) |
| **Buffer size** | 1 kilobyte |
| **Paper options** | Fan fold (3–10 inches wide) Single sheet (4–9 inches wide) Roll (4–9 inches wide) |
| **Font styles** | Pica, elite, compressed, elongated, superscript, subscript, italics |
| **Character sets** | Ascii, IBM, block graphics |
| **International character sets** | English, American, Danish, French, Swedish, Italian, Spanish, Japanese, Norwegian |
| **Extras included** | Printer stand, fanfold paper, roll of paper, printer cable |
| **Price** | £189.95 |
| **Manufacturer** | Panasonic Industrial UK, 300–318, Bath Road, Slough, Berks SL1 6JG. 0753 73181. |

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# Small business made as simple as ABC

As any small business owner or self-employed person knows, sorting out the files and books can be a tedious and frustrating chore. Tony Bridge discovered that ABC Systems has made the task easier.

There are many packages offering "total integration" for the small business, and here is another from ABC Systems. In the past two or three years, the availability of inexpensive IBM clones such as the Amstrad PC1512 should leave no doubt in the small trader's mind that now is the time to harness the power of a computer to take care of all the tedious paperwork tasks which beset the one-man/woman business. How does ABC measure up to the competition?

The package consists of six main sections: on boot-up, the user is presented with an opening "notice-board", on which you can leave messages to yourself or other users for the next day. Also on-screen is the current day's page from the diary; you can edit this, or examine the entry for a different day. In addition, you'll see the Main Menu, from which the various modules of the program can be selected. This opening screen is very colourful, but the colours can be easily re-defined by the user, as can other things such as the company name, passwords and even help screens. The general screen layout is carried through the entire suite of programs, and the menus are all manipulated in the same way – the user highlights the chosen option with the cursor and then confirms the selection with the spacebar. If a pop-up menu gets in the way of on-screen information, it can be easily moved out of the way.

The book-keeping section of the package belies the origins of ABC, and indeed is the heart of the system: making its first appearance on the Commodore PET, the program then progressed to the Commodore 128, combining the original book-keeping facilities with a simple database section which could be used from the book-keeping program. Consequently, these are the most developed parts of ABC, and very impressive they are too. The major feature here is the full double-entry – it's simple to use, and means that any alteration made to one side of the account is mirrored in the necessary places, and the user really has no worries as far as VAT returns and tax audits are concerned, as ABC updates these automatically. Unlike other products, which assume petty cash to be non-VAT, this program allows the user to nominate VAT on petty cash as required. The latest version also boasts a "cash with order" option, so that no longer do you have to complete the invoice, then post the cheque, then reconcile the two and so on. As we'll see, the program automatically updates every part of the suite as necessary.

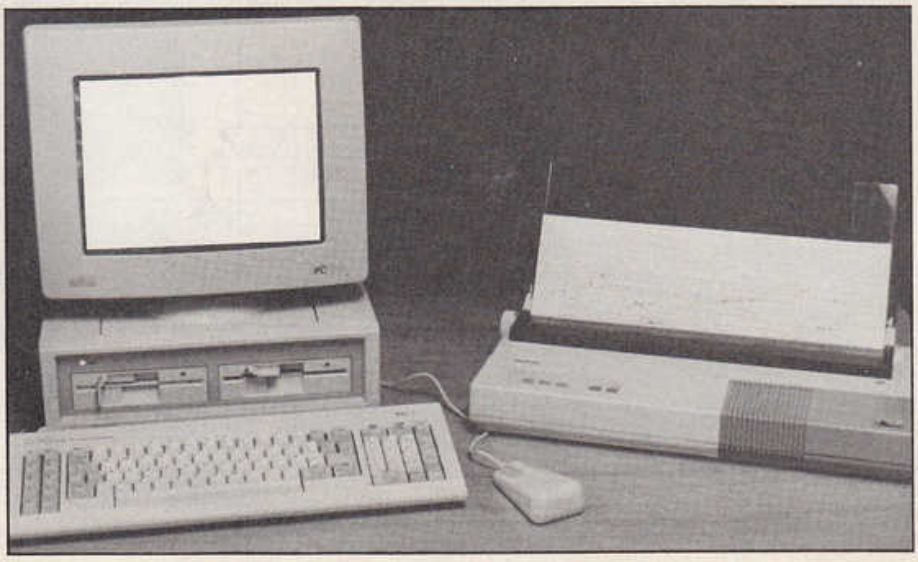
**"Everything can be printed out, so that invoices, stock lists, VAT records, stock lists, audit trails and so on can all be pressed into service from the one package. At year's end, all this may be collated and passed on to your accountant"**

Setting up the package is easy: although the manual is one of the best I've seen, it's not really needed until some of the more complex features of ABC are explored. Prior to any invoicing, details of your customers are typed into the database – this is accessed while invoices are written. It's simple, but quite adequate for the purpose, with for each record a main screen giving address and phone number and so on, and a supplementary overlay giving further details of discounts, contacts and credit limits (most important!); up to 999 customers can be catered for. The database can be conditionally searched, so that all Smiths owing more than £250 can be quickly found, and individual records "tagged' for future reference – as ABC is an integrated package, this information may also be passed on to the other modules and used there.

Once the database has been built up (and of course it can be altered at any time in the future), the Stock module must be pressed into service to give an overview of your current stock levels (with timely reminders to re-order), the value of each item and so on. All this information is used and updated when typing invoices.

Filling in invoices is easily done; the information on each customer (address, trade discount if any, special requirements and so on) is taken from the Filing Program and automatically inserted in the correct place along with other relevant details – once this is done, the main part of the invoice is shown, and now the details of the

**continued on page 18 ▶**



◀continued from page 17

transaction can be entered.

All the way along, ABC will help you; first of all, the main heading is entered (and if you've forgotten which is which – there can be up to 250 headings – pressing *Return* at this point will give you a list to jog your memory and choosing is then a simple matter of highlighting the item).

Now enter the quantity of items and the name of the item – ABC automatically calculates the price of each item and fills in the total, though a full calculator is available so that you can, for example, knock off an extra 5 or 10% also. Select the VAT rate, and the running total is updated accordingly. The resulting invoice may be printed on pre-printed material or your own paper – ABC will, for a nominal fee, arrange the program to your special requirements.

At the same time, and it is here that the program *really* comes into its own, the stock is adjusted, and the current financial situation updated to reflect the transaction. Not only this, but the customer's record is also updated – so the current financial situation can be easily examined at any time, with customer's records, stock levels as well as profit-and-loss being instantly displayed.

So far, so good and all is as expected. Everything can be printed out, so that invoices, stock lists, VAT records, audit trails and so on can all be pressed into service from the one package. At the year's end, all this may be collated and passed on to your accountant (and the manual includes several notes to introduce your accountant to computerised books).

But ABC is much more impressive than even this. Also contained on the master disc are a word processor and spreadsheet. Although the individual elements of the package aren't so extensive and comprehensive as dedicated, stand-alone programs, nevertheless each one is probably as much as the small businessman needs or wants.

For example, the word processor can't hold a light to something like PCWrite, Wordstar (in any of its guises) or WordPerfect, but it is perfectly adequate for the sort of quick one-off letters that everyone needs to dash off. All the required commands are here – word wrap on/off, margins, tabs, justification and search and replace, as well as some other useful facilities, such as redefinable windows and mail-merge using data from the Filing program.

Similarly, the spreadsheet (or *CalcSheet*, as it is called here) can only boast a matrix of 26 by 55 cells, so isn't going to handle the year's financial modelling for ICI or Shell UK – but it's enough for Jones the Corner Shop. (The latest version of ABC features greatly-enhanced facilities in the spreadsheet, including Sum of a Range of a Cells, and replicating or copying the contents, number or formula, of one cell to another.)

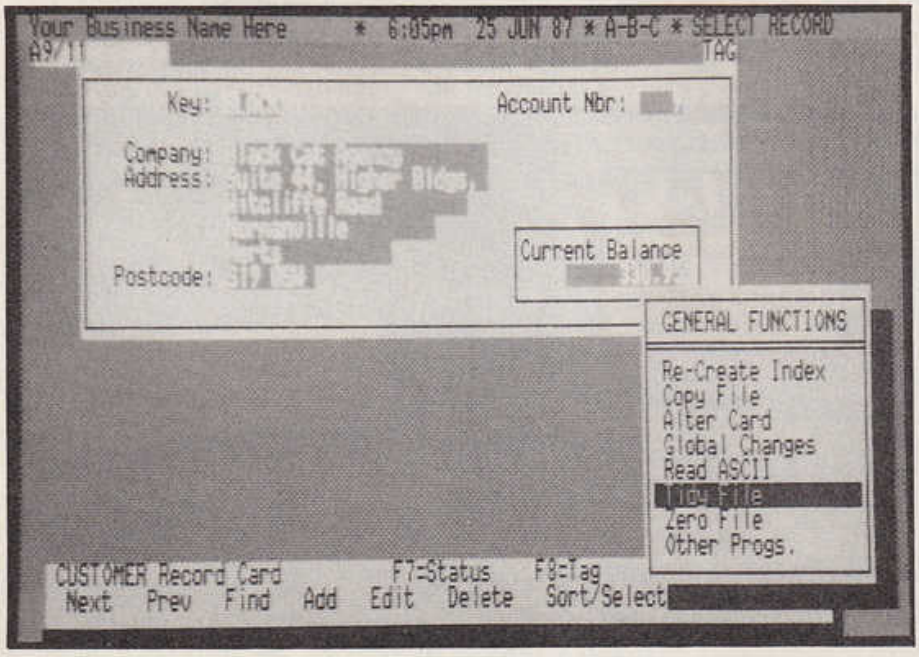
Pressing F9 at any point in the program displays another menu: from here a large number of extra functions are available, including a typewriter mode, which can be used for typing out individual envelopes, a calculator, printer and disc management departments, a phone book (which can be searched at will), a diary/alarm clock and the rubber stamp.

This latter facility is one of the major features of the program, in my opinion, and one which has come in handy while I've been reviewing the package (giving it the baptism of fire in a business environment!). This allows the user to 'cut' a portion of a screen (from any part of any of the programs) and 'paste' it into the current module. So, for example, while typing out an invoice, you could cut out a phone number or address form the phone book and place it in the body of the invoice. Not only this, but standard phrases and paragraphs ("pay up or we'll send in the lads") can be stored on disc and called up whenever necessary.

As I've said, the whole program is very easy to use, but a couple of minor points caused me some grief. Using the calculator without the printer being on-stream can cause the program to freeze and there are some other small details which, although they won't cause too many problems, can be upsetting to the busy user.








These "bugs" really arise from not reading the manual properly; it's probably only reviewers that stumble across these out-of-the-way anomalies, and it is also, I admit, only reviewers who skim through the manual, thus laying themselves open to well-earned indignation from the authors. But the busy shopkeeper may also fall into the same trap, so should be doubly on his guard when tackling a complex program such as this. I'm glad to say, though, that ABC's backup is personal, very friendly and patient and the User's Club will supply updates as they occur. The authors are commendably willing to assimilate and act upon feedback from customers and as we've seen, the latest version features in particular a much-expanded spreadsheet).

I've been using this program for some weeks now, and it certainly makes a cinch of the whole business of book-keeping, invoicing and stock-taking. It brings the computer into its own and makes it really earn its keep. With its ease of use, the excellent manual and the back-up help available at the end of the telephone, any small business thinking of going into computers will find ABC one of the best packages available to look after the books.

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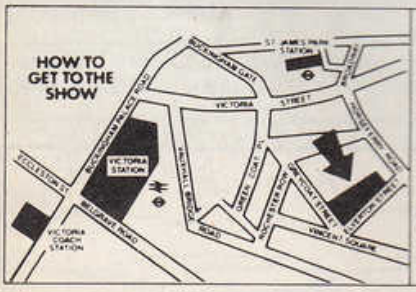



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# HOW TO BUILD RAINBOWS

Paul McKinley continues his series on graphic creations with a look at the way various machines use colour, and how you can use colour to maximum advantage in your drawings.

As promised, this week I'll deal with colour on various machines and go into the effects that can be achieved with the fill and airbrush functions.

It is naturally impossible to deal in one short article with the different graphic displays of every computer on the market in detail. Instead I've split them into three main types.

Type one is limited to two colours per character square. This is the sort of display supported by the Spectrum and C64 in hi-res mode. Type two is a four-colour screen as in C64 low-res, Amstrad and BBC mode 1; and type three is multi-colour. Amstrad mode 0, Enterprise and Atari 800 are the best 8-bit examples of this type but the ST and Amiga leave them standing when it comes to choice of colours.

Most computers trade off resolution for colour. If you want a lot of colours you can't have them on a hi-res screen. A way round this restriction is to use various fill patterns to 'mix' the available colours till you get the shade you want. A quick demonstration of this can be had by filling your screen with solid red then filling a checkerboard pattern in yellow over it. If you stand at the other end of the room and squint, your screen will look splotchy orange. Obviously this method has some drawbacks and some colour mixes will work better than others. Experiment with different colour combinations on your own computer to find which work best on it. Opposite colours like red/blue will work less well than colours that are similar such as blue/green.

If you are using an old Dragon you'll be stuck with two colours in hi-res mode, even so Fig. 1 shows what can be achieved using only four fills of various densities.

## Sunsets

As a demonstration of expanding available colours by fill patterns I've drawn three identical pictures, one in each type of display. Fig. 2 shows the 16-colour version. The trees and lake will stay the same in the other pictures, only the mountain and the sunset sky will differ.

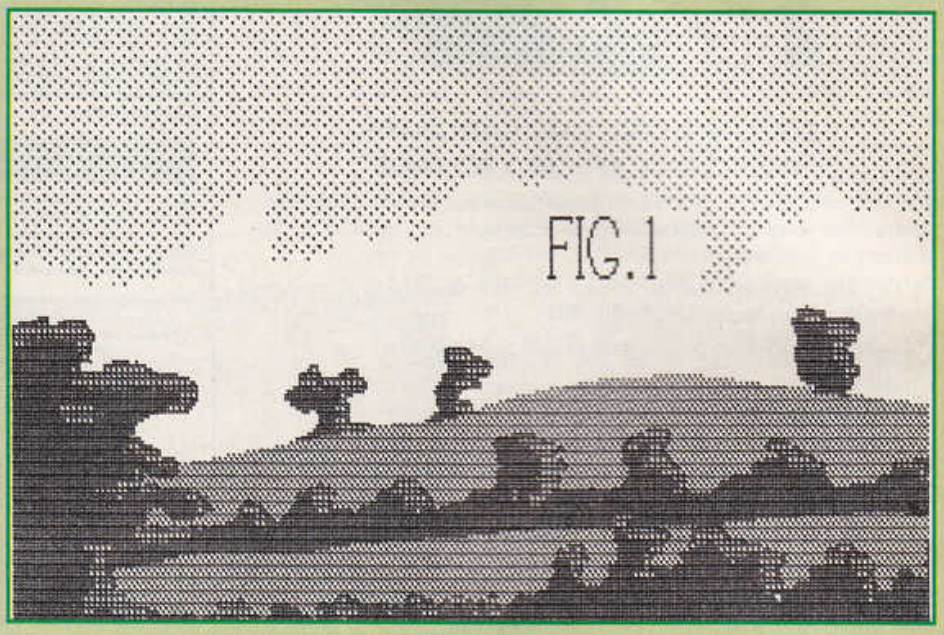
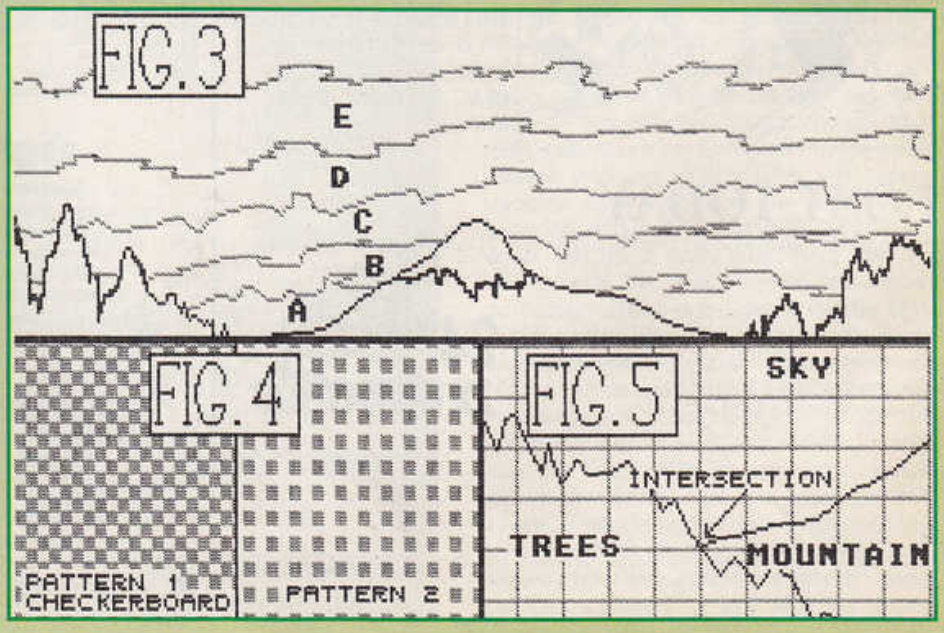


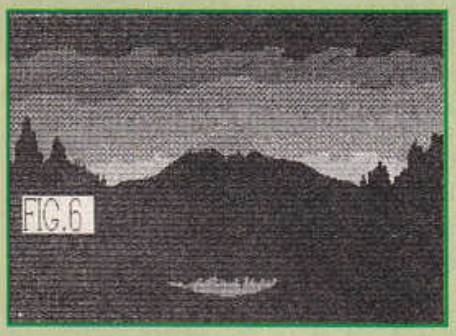

**Fig. 1 (above): this demo uses only four different density fills. Fig. 3 (below): The lake must mirror the jagged edges. Fig. 4: Differences in fill densities. Fig. 5: Choosing your horizons.**



For the four-colour version I'll need black for the silhouette of the trees and blue for the mountain. Since this is a sunset scene, red must be one of the other colours and I need white for the snowcap on the mountain so that limits my choice of colours to red, blue, black and white.

The trees are simply a freehand outline filled with solid black and the mountain filled with blue. The lake between the trees is reflecting the sky so that should be solid red. Note that the top edge of the lake is also reflecting the tops of the trees so it should be drawn jagged. Fig. 3 shows the borders for the various fills that will be used. The snowcap can be either a solid white fill or a white checkerboard. Different densities of fills are shown in Fig. 4.

Fill area A with solid red then with pattern 1 in white. Area B is red with pattern 2 and area C is just solid red. Area D is red with pattern 2 in black and area E is red with pattern 1. This should give you Fig. 6. If you have room you might like to add a top area in solid black. Fill the areas with high dot densities first as the denser patterns would 'leak' into the light patterns.




The two colour per character square version uses much the same tricks except that each area must have a dot fill in the same colour as the solid fill immediately above or below it. If the top area were black then the area below should be red with a black dot fill, the area below that solid red and below that red with a white fill. The bottom area should be left white to avoid attribute clashes with the snowcap. Clashes between the white sky, the blue mountain and the black trees can be avoided by making sure that the tree line intersects the mountain at the join of four character squares (Fig. 5).

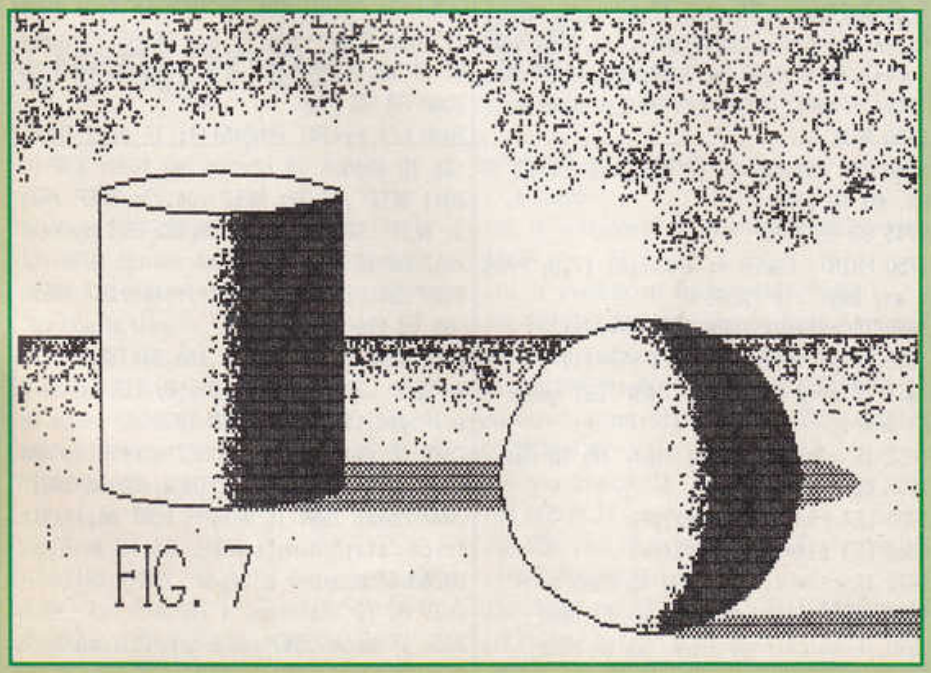
Shading with colour or fills can also help to make flat shapes look solid. Try this experiment. Draw a box on screen and divide it into several equal sections with vertical lines. Now fill each section with, in order, black, blue, cyan and white. This gives it the impression of a cylinder being lit from one side. Try adding more shades with various fills and using different shapes like cubes and spheres.

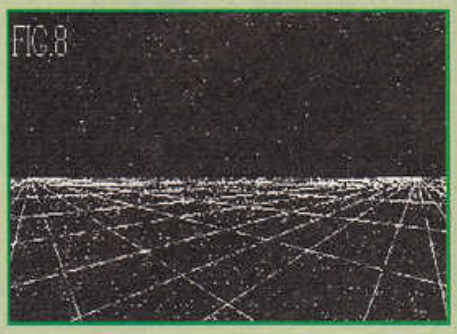



## Airgun

The airgun or spray function can also be used like fill to provide shading and 3D effect. Fig. 7 shows where spray has been used to shade a sphere and cylinder. The ground and sky were also done with spray.

Most graphic packages will allow you to alter the density or pattern of the spray and the more up-market ones will allow you to divide the colour it affects so you can spray one area without overspilling onto another. This is not an available option on the sort of package most people will be using so spray must be used carefully, with your finger on the undo button and magnify to clean up the picture afterwards. With a little forethought colour masking can help keep a picture neat.




Take an aerial night view of a city. Draw a line across the screen (the horizon) and fill the bottom half with black. Now use ray from two points on the horizon to draw intersecting white lines across it. These are the streets. A medium spray of white will be the building lights. They should get denser towards the horizon. Fill the top of the screen with yellow and spray the bottom half again, this time with yellow. It may be necessary to draw a line of yellow along the top of the black area to prevent the yellow fill from 'leaking' into the white lines. Any stray pixels that splash the top half will not be noticed. Do the same for a light spray of red and blue. Now fill the top with black and spray the bottom lightly, also with black. This stops the street lights being too regular. A light spray of white on top will make a starry sky (Fig. 8).

Next week I'll deal with more complex shapes such as buildings and people.

# A Game of Two Halves

Andrew Oldacre

The game with an identity problem is concluded this week, with part three of the listing. The observant out there will realise that we printed part four last week. It will all still work though, if you pay heed to the reprinting of line 408 which was partly erased when it originally appeared.

```
1590 IF 1$(1)<>"y " THEN  GO TO 1600
1591 LET mon=mon+mo: IF k$(n)="p" THEN
LET pick=pick-1
1592 FOR x=1 TO 40: IF p$(x)="*
 " THEN  LET p$(x)=s$(n): LET 1(x)=j(n):
 LET s$(n)="*           ": LET g(n)=0: LE
T j(n)=0: LET k$(n)=" ": LET f$(x)=v$(co
): GO TO 1594
1593 NEXT x
1594 LET sq=sq-1: LET sel=mo
1597 PRINT  PAPER 2; INK 7;AT 19,0;"You
have sold him to ";v$(co): BEEP .4,3: PA
USE 75
1600 LET mset=0
1608 BORDER 7: PAPER 7: CLS
1609 LET wg=0: LET inc=INT inc
1610 FOR x=1 TO 15: LET wg=wg+j(x)*INT (
100/dv): NEXT x: LET wg=wg+450: LET wg=I
NT wg
1611 IF dv=1 THEN  LET wg=wg+(2500*3)
1612 IF dv=2 THEN  LET wg=wg+(1450*3)
1613 IF dv=3 OR dv=4 THEN  LET wg=wg+(10
00)
1620 IF gmc=22 AND loan>0 THEN  LET nn=l
oan
1621 FOR x=1 TO 12: LET r(x)=f(x)-h(x):
IF r(x)>mset THEN  LET mset=r(x)
1622 NEXT x
1623 LET min=mset: LET ct=1
1624 PRINT  PAPER 4; INK 7;AT 0,3;"* Bal
ance Sheet *": PRINT  INK 1;AT 2,3;"Gate
 Income #";inc''AT 4,3;"Bonus Money #";b
on''AT 6,3;"Sales #";sel''AT 8,3;"Signin
gs #";buy''AT 10,3;"Wage Bill #";wg+450'
'AT 12,3;"Bank loan payment #";nn
1625 LET mon=mon+INT inc-(wg+450): LET m
on=mon-nn: IF gm=22 AND loan>0 THEN  PRI
NT  INVERSE 1;AT 13,3;"Bank loan repaid
#";loan: LET mon=mon-loan: LET loan=0
1626 PRINT  INK 0;AT 15,3; INVERSE 1;"La
st weeks balance #";pm
1627 PRINT  INK 3;AT 16,3; INVERSE 1;"Th
is weeks balance #";mon
1628 LET bal=mon-pm
1629 LET sel=0: LET buy=0
1630 IF bal<0 THEN  PRINT  INK 7; PAPER
2;AT 18,3;"Profit margin #";bal: LET nn=
0
1631 IF bal>=0 THEN  PRINT  INK 7; PAPER
 0;AT 18,3;"Profit margin #";bal: IF nn>
0 THEN  LET nn=0
1632 IF gmc<22 AND loan>0 THEN  PRINT  I
NK 4; INVERSE 1; FLASH 1;AT 13,3;"Pay of
f loan?": INPUT 1$(1): IF 1$(1)="y " OR
1$(1)="Y " THEN  GO SUB 3100
1633 IF gmc<20 AND loan=0 AND nn=0 THEN
 PRINT  INK 4; INVERSE 1; FLASH 1;AT 13,
3;"Bank Loan Required?": INPUT 1$(1): IF
 1$(1)="y " OR 1$(1)="Y " THEN  GO SUB 3
000
1634 IF gmc=22 AND mon<20000 THEN  PRINT
  INK 6; PAPER 21; FLASH 1; BRIGHT 1;AT
21,1;"You have been sacked as manager":
LET con=1: LET cid=1
1635 IF gmc=22 AND mon>=20000 THEN  LET
cid=0
1638  PRINT AT 20,3; INK 6; PAPER 1; FLA
SH 1;"Please wait for league table"
1639 LET min=mset: LET ct=1
1640 FOR x=1 TO 12
1650 IF r(x)=min THEN  LET t$(ct)=z$(x):
 LET c(ct)=p(x): LET q(ct)=w(x): LET y(c
t)=m(x): LET z(ct)=o(x): LET s(ct)=f(x):
 LET t(ct)=h(x): LET b(ct)=a(x): LET ct=
ct+1
1660 NEXT x
1670 LET min=min-1
1680 IF min<-40 OR ct>12 THEN  GO TO 169
0
1685 GO TO 1640
1690 LET max=3*gmc: LET ct=1
1700 CLS : PRINT  PAPER 6; INK 0;AT 1,3;
"Football League Division ";dv'AT 3,0;"P
s.Teams.....Pd.W.D.L.F..A.Pts"
1711 IF dv=4 THEN  LET is=3
1712 IF dv=3 THEN  LET is=2
1713 IF dv=2 THEN  LET is=0
1714 IF dv=1 THEN  LET is=1
1715 FOR x=1 TO 12
1721 IF b(x)=max THEN  BEEP .04,12: PRIN
T  INK is;AT ct+3,0;ct;AT ct+3,3;t$(x);A
T ct+3,14;c(x);AT ct+3,17;q(x);AT ct+3,1
9;y(x);AT ct+3,21;z(x);AT ct+3,23;s(x);A
T ct+3,26;t(x);AT ct+3,29;b(x): LET ct=c
t+1: IF gm=11 THEN  LET x$(ct-1)=t$(x)
1730 NEXT x
1740 LET max=max-1: IF max<0 OR ct=13 TH
EN  GO TO 1750
1745 GO TO 1715
1750 PRINT  PAPER 4; INK 7;AT 17,8;"Pres
s any key...": PAUSE 0
1829 IF p(1)=22 THEN  LET rf=rf+1
1830 IF p(1)=11 THEN  LET rf=rf+1
1831 IF rf=2 AND gm=11 THEN  LET gm=0: L
ET gme=1
1832 IF rf=3 AND gm=11 THEN  GO TO 1840
1833 GO TO 400
1850 LET cfo=INT (RND*12)+1
1860 LET cft=INT (RND*24)+1
1870 IF cfo=cft THEN  GO TO 1860
1880 IF a$(cfo)=y$ THEN  GO TO 1850
1890 IF v$(cft)=y$ THEN  GO TO 1850
1891 LET t$(1)=a$(cfo): LET t$(2)=v$(cft
)
1892 IF t$(1)=t$(2) THEN  GO TO 1850
1901 IF smf>0 AND u$<>"i" THEN  LET t$(2
)=v$(smf)
1910 IF u$="i" THEN  LET t$(2)=y$
1911 IF d$(20)<>"*           " THEN  LET
t$(2)=d$(20)
1912 IF t$(1)=t$(2) THEN  GO TO 1850
1920 BORDER 0: PAPER 0: CLS
1930 PRINT  INK 1; PAPER 5;AT 0,6;"* Wem
bley Cup Final *"
1931 PRINT  INK 7;AT 12,10;"Press any ke
y": PAUSE 0: PRINT AT 12,10;"
  "
1940 LET hs=0: LET as=0: LET ps=9
1950 LET ti=0
1960 PRINT  PAPER 7; INK 1;AT 4,10;t$(1)
;" ";hs''AT 7,10;t$(2);" ";as
1961 IF ti=0 THEN  PAUSE 100: BEEP .3,6
1970 PRINT  PAPER 6; INK 1;AT 20,11;"* T
ime ";ti;"*": BEEP .003,33
1971 PAUSE 10
1980 LET rd=INT (RND*200)+1
1990 IF rd=33 OR rd=46 OR rd=27 OR rd=11
 THEN  GO TO 2010
2000 IF rd=37 OR rd=149 OR rd=17 OR rd=2
8 THEN  GO TO 2020
2005 LET ti=ti+1: BEEP .001,3
2006 IF ti=46 THEN  FOR x=1 TO 20: BEEP
.03,x+2: NEXT x: PRINT  INK 6;AT 18,10;
INVERSE 1;"Half Time ";hs;"-";as: PAUSE
200: PRINT AT 18,10;"                ": G
O TO 1960
2007 IF ti=91 THEN  FOR x=1 TO 20: BEEP
.02,x+2: PRINT  INK 7; INVERSE 1;AT 18,1
0;"Full Time ";hs;"-";as: PAUSE 200: PRI
NT AT 18,11;"                ": GO TO 2030
2008 GO TO 1960
2010 LET ri=INT (RND*5)+1: IF ri=2 THEN
 GO TO 1960
2011 BEEP .03,32: BEEP .06,23: BEEP .07,
2: BEEP .08,13: BEEP .07,18: LET hs=hs+1
2012 GO TO 1960
2020 LET ri=INT (RND*5)+1: IF ri=2 THEN
 GO TO 1960
2021 BEEP .03,32: BEEP .06,23: BEEP .07,
2: BEEP .08,13: BEEP .07,18: LET as=as+1
: IF y$<>t$(2) THEN  GO TO 1960
2022 IF y$=t$(2) THEN  LET scr=INT (RND*
15)+1: IF k$(scr)<>"p" THEN  GO TO 2021
2023 PRINT  INK 7; BRIGHT 1;AT ps,7;s$(s
cr);" ";ti;" Mins": BEEP .03,4
2024 LET ps=ps+1
2029 GO TO 1960
2030 IF hs=as THEN  CLS : PRINT  PAPER 5
```

```
; INK 1;AT 10,12;"* Replay *": PAUSE 100
: GO TO 1920
2040 IF hs>as THEN  LET t$(3)=t$(1)
2050 IF hs<as THEN  LET t$(3)=t$(2)
2060 BORDER 7: PAPER 7: CLS
2070 FOR x=0 TO 20: PRINT  INK 6; PAPER
2; BRIGHT 1; FLASH 1;AT x,5;t$(3);" Won
The Cup!": BEEP .04,x+2: NEXT x
2080 PAUSE 400: CLS
2090 IF dv>1 THEN  LET t$(4)=a$(INT (RND
*12)+1)
2100 IF dv=1 THEN  LET t$(4)=x$(1)
2110 PRINT  PAPER 4; INK 7;AT 1,4;"End O
f Season Statistics"
2120 PRINT  INK 1;AT 5,4;"League Champs.
";t$(4)''AT 7,4;"Cup winners ";t$(3)
2130  IF dv>1 THEN  PRINT  INK 0;AT 9,4;
"Champs Div ";dv;" ";x$(1)
2140 IF t$(3)=t$(4) THEN  PRINT ; INK 1;
 FLASH 1; BRIGHT 1;AT 12,4;t$(4);" won t
he double!"
2141 IF t$(3)=y$ THEN  PRINT  INK 6; PAP
ER 2; FLASH 1;AT 14,4;"You won the FA Cu
p !!!!!": LET cpin=1
2142 IF t$(4)=y$ THEN  PRINT  INK 6; PAP
ER 2; FLASH 1;AT 16,4;"You are league ch
ampions!": LET lgin=1
2143  IF t$(4)<>y$ THEN  LET lgin=0
2144  IF t$(3)<>y$ THEN  LET cpin=0
2150 PRINT  PAPER 4; INK 7;AT 20,8;"Pres
s any key": PAUSE 0: CLS
2151 PRINT  PAPER 1; INK 7;AT 10,10;"*EN
D OF SEASON*"
2152 FOR x=50 TO 1 STEP -2: BEEP .03,x:
NEXT x
2160 LET ro=INT (RND*12)+1
2170 LET rro=INT (RND*12)+1
2180 IF ro=rro THEN  GO TO 2170
2190 IF a$(ro)=t$(4) THEN  GO TO 2160
2200 IF a$(rro)=t$(4) THEN  GO TO 2160
2210 LET t$(5)=a$(ro)
2229 LET t$(6)=a$(rro)
2230 IF dv=1 THEN  LET t$(5)=x$(11): LET
 t$(6)=x$(12)
2240 LET ro=INT (RND*12)+1
2250 LET rro=INT (RND*12)+1
2260 IF ro=rro THEN  GO TO 2250
2270 LET t$(7)=b$(ro)
2280 LET t$(8)=b$(rro)
2290 IF dv=2 THEN  LET t$(7)=x$(1): LET
t$(8)=x$(2)
2300 LET po=INT (RND*12)+1
2310 LET poo=INT (RND*12)+1
2311 IF poo=ro OR po=ro OR poo=rro OR po
=rro THEN  GO TO 2300
2320 IF poo=po THEN  GO TO 2310
2330 LET t$(9)=b$(poo): LET t$(10)=b$(po
)
2340 IF dv=2 THEN  LET t$(9)=x$(11): LET
 t$(10)=x$(12)
2350 LET ro=INT (RND*12)+1
2360 LET rro=INT (RND*12)+1
2370 IF ro=rro THEN  GO TO 2360
2380 LET t$(11)=c$(ro): LET t$(12)=c$(rr
o)
2390 IF dv=3 THEN  LET t$(11)=x$(1): LET
 t$(12)=x$(2)
2400 LET po=INT (RND*12)+1
2410 LET poo=INT (RND*12)+1
2411 IF poo=ro OR po=ro OR poo=rro OR po
=rro THEN  GO TO 2400
2420 IF poo=po THEN  GO TO 2410
2430 LET t$(13)=c$(po): LET t$(14)=c$(po
o)
2440 IF dv=3 THEN  LET t$(13)=x$(11): LE
T t$(14)=x$(12)
2450 LET ro=INT (RND*12)+1
2460 LET rro=INT (RND*12)+1
2470 IF ro=rro THEN  GO TO 2460
2480 LET t$(15)=d$(ro): LET t$(16)=d$(rr
o)
2490 IF dv=4 THEN  LET t$(15)=x$(1): LET
 t$(16)=x$(2)
2500 FOR x=1 TO 12
2510 IF a$(x)=t$(5) THEN  LET a$(x)=t$(7
)
2520 IF a$(x)=t$(6) THEN  LET a$(x)=t$(8
)
2530 IF b$(x)=t$(8) THEN  LET b$(x)=t$(6
)
2540 IF b$(x)=t$(7) THEN  LET b$(x)=t$(5)
```



# RSX Designer

Gareth L Perkins

With this useful program you can turn any machine code in memory into an *RSX* call, whether it is your own code or a firmware call. You are also allowed to assign your own name and initialisation address to the *RSX*.

For example, if you use the address &BB06, the name *:WAITKEY, Return* for the end address,and &8000 for the address to store the *RSX* at and you will have a pause command.

```
10 REM **RSX Designer** by Gareth L. Per
kins
20 CALL &BBFF:MODE 2:PEN 1
30 INPUT "Enter Name of RSX >",name$
40 IF LEN(name$)>16 THEN GOTO 20:REM max
 16 characters
50 IF LEFT$(name$,1)="|" THEN name$=RIGH
T$(name$,LEN(name$)-1)
60 name$=UPPER$(name$):FOR a=1 TO LEN(na
me$):IF (ASC(MID$(name$,a,1))<65 OR ASC(
MID$(name$,a,1))>90) AND ASC(MID$(name$,
a,1))<>46 THEN PRINT "Illegal Name!":END
:ELSE NEXT
70 PRINT:INPUT "What is the execution ad
dress for the RSX >",addr
80 IF addr<0 THEN addr=65536+addr
90 PRINT:INPUT "What is the end address
>",endaddr
100 IF endaddr<0 THEN endaddr=65536+enda
ddr
110 IF endaddr=0 THEN endaddr=addr
120 PRINT:INPUT "Do you wish to have a s
pecified address to set up RSX (Y/N) >",
q$:IF UPPER$(q$)="Y" THEN PRINT:INPUT "A
ddress:",start:start=start-65536*(start<
0):GOTO 140
130 start=addr-36
140 GOSUB 240
150 FOR i=0 TO 8:READ b$:POKE start+i,VA
L("&H"+b$):NEXT
160 PRINT:PRINT "Actual Start Address &"
;HEX$(start,4);" ("start")"
170 table=start+9:t$=HEX$(table,4):POKE
start+1,VAL("&"+RIGHT$(t$,2)):POKE start
+2,VAL("&"+LEFT$(t$,2)):FOR i=1 TO LEN(n
ame$):POKE table+8+i,ASC(MID$(name$,i,1)
):NEXT:POKE table+7+i,PEEK(table+7+i)+12
8
180 buffer=start+14:FOR i=buffer TO buff
er+3:POKE i,0:NEXT:b$=HEX$(buffer,4):POK
E start+4,VAL("&"+RIGHT$(b$,2)):POKE sta
rt+5,VAL("&"+LEFT$(b$,2))
190 syntax=table+9:s$=HEX$(syntax,4):POK
E table,VAL("&"+RIGHT$(s$,2)):POKE table
+1,VAL("&"+LEFT$(s$,2))
200 POKE table+2,&C3:a$=HEX$(addr,4):POK
```

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# PROGRAMMING: AMSTRAD CPC

◀ continued from page 23

```
E table+3,VAL("&"+RIGHT$(a$,2)):POKE tab
le+4,VAL("&"+LEFT$(a$,2))
210 finish=start+19+LEN(name$)+1:POKE fi
nish,0:CALL start:PRINT:PRINT "RSX:|"nam
e$,"installed.":PRINT
220 PRINT "Start Address of RSX:&"HEX$(s
tart,4)" ("start")":PRINT "End Address o
f RSX:&"HEX$(finish,4)" ("finish")":PRIN
T "Start Address of Code:&"HEX$(addr,4)"
 ("addr")":PRINT "End Address of Code:&"
HEX$(endaddr,4)" ("addr")"
221 PRINT:PRINT "Do you want another RSX
 (Y/N) >";:INPUT "",a$:IF UPPER$(a$)="Y"
 THEN RUN ELSE END
230 DATA 01,00,00,21,00,00,C3,D1,BC
240 IF start>65536+&A500 THEN start=star
t-10:GOTO 240:ELSE IF start<2048 THEN st
art=start+10:GOTO 240
250 IF start+19+LEN(name$)+1>addr AND s
tart<=endaddr THEN PRINT "It will overwr
ite your Code!":END
260 IF start<HIMEM THEN MEMORY start-1
270 RETURN
```

# PROGRAMMING: BBC B

## Corruption

J E Gudgeon

If your favourite program steadfastly refuses to load from tape any more take heart from this corrupted program recoverer.

After it has been debugged load it into the computer using *"LOAD "RECOVER"* *5000*. Then enter *PAGE=&5000:RUN*. The computer issues prompts to start and stop the tape.

After asking for a printer output the program is listed on the screen. Note that this program works with Basic 2 only.

```
  10MODE7
  20tokens=&8071
  30start=&E00
  40PRINTCHR$(141);CHR$(129)+CHR$(157);
CHR$(132);"    CFS PROGRAM RECOVERER"
  50PRINTCHR$(141);CHR$(129)+CHR$(157);
CHR$(132);"    CFS PROGRAM RECOVERER"
  60VDU28,0,23,38,3
  70*TAPE
  80*OPT2,0
  90*MOTOR1
 100PRINT"Forward Tape To Start Of Corr
upted  Program Then Hit A Key "
 110space$=GET$
 120*LOAD "" E00
 130CLS
 140PRINT"Corrupted Program Loaded"
 150INPUT'"Output To Printer Y/N "respo
nse$
 160IF response$="Y" THEN VDU2
 170REM START RECOVERING
 180A=start-1
 190REPEAT
 200A=A+1
 210UNTIL ?A=13
 220IF ?A=13 THEN A=A+3
 230length=?A
 240A=A+(length-3)
 250IF ?A<>13 THEN ?A=13
 260A=A-length
 270A=A+1
 280IF ?A=&FF THEN PROCend
 290REPEAT
 300 PRINT?A*256+A?1;
 310A=A+3
 320PROCrest
 330UNTIL ?A=&FF
 340:
 350DEF PROCrest
 360REPEAT
 370IF ?A=&8D PROCgoto/gosub ELSE IF ?A
>=&80 PROCkeyword ELSE IF ?A>=ASC" "PROC
char
 380UNTIL ?A=13
 390PRINT
 400A=A+1
 410IF ?A=&FF THEN PROCend
 420ENDPROC
 430:
 440DEF PROCgoto/gosub
 450L=(A?1 AND 48)*4 EOR A?2
 460H=(A?1 AND 4)*16 EOR A?3
 470 PRINTL+256*H;
 480A=A+4
 490ENDPROC
 500:
 510DEF PROCkeyword
 520REM FIND KEYWORD
 530Q=tokens
 540REPEAT
 550K=Q
 560REPEAT
 570Q=Q+1
 580UNTIL ?Q>=&80
 590IF ?Q<>?A THEN Q=Q+2
 600UNTIL ?Q=?A
 610Q=K
 620REM PRINT KEYWORD
 630REPEAT
 640PRINTCHR$ ?Q;
 650Q=Q+1
 660UNTIL ?Q>=&80
 670A=A+1
 680ENDPROC
 690:
 700DEF PROCchar
 710PRINTCHR$(?A);
 720A=A+1
 730ENDPROC
 740:
 750DEF PROCend
 760PRINT''"End Of Corrupted Program"
 770END
 780ENDPROC
```

# PROGRAMMING: C16

## Better Basic

Peter Finan

Add 12 new commands, five extra resident variables, two functions and easy binary and hexadecimal interpretations, to your Commodore 16 with this program.

Once all the data has been correctly typed in, enter *SYS 14408* to initialise. The new commands are as follows.

*!POKE a,n* pokes a 16 bit number *n* into locations *a* and *a+1*.

*!GOTO n* is a calculated jump statement. For example, *!GOTO A*10+10*.

*!GOSUB n* is similar to above.

*!KEY n* simulates the pressing of function key *n* from within a program.

*!CLR* clears the keyboard buffer.

*!SCNCLR* reverses a text screen.

*!LOCATE x,y* puts the cursor at position *x,y* on the screen.

*!NEW n* produces a cold start if *n=0*, and warm start if *n=1*.

*!GET a,b* makes the keys repeat if *a=1*, and not if *a=0*. *B* sets the delay before keys repeats, and is normally set to three.

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*!DEFUSR a* sets the address for the *USR* command.

*!SOUND a,b,c,d* is an all in one sound command where *a=volume, b=channel, c=pitch, d=duration.*

*!OLD* will retrieve programs immediately after a *NEW* command.

The next section are all new types of variable.

*@DATA* holds the line number from which the last *DATA* statement was *READ.*

*@KEY* holds the value of the last key pressed.

*@LINE* holds the line number currently being executed, or the one to be executed.

@X holds the value of the current column for printing.

*@Y* holds the value of the current row for printing.

Next, the functions and conversions.

*%BBBBBBBB* interprets an eight bit binary number.

*$HHHH* interprets a 16 bit hexadecimal value.

*&PEEK a* will reveal the contents of address *a* and *a+1* as a 16 bit number.

*&VAR a* returns the address in memory of the variable *a.*

```
READY.
1 REM ******************************
2 REM **  C-16 ADDITIONS TO BASIC **
3 REM **  WRITTEN BY PETER FINAN  **
4 REM **          FOR             **
5 REM ** POPULAR COMPUTING WEEKLY **
6 REM **        JUNE 1987         **
7 REM ******************************
10 POKE 55,255:POKE 56,57:CLR
15 AD=DEC("3A00")
20 FOR LI=1 TO 108
25 SUM=0
30 FOR BY=1 TO 8
35 READ A:POKE AD,A:SUM=SUM+A:AD=AD+1
40 NEXT BY
45 READ CHECK:IF CHECK=SUM THEN 55
50 PRINT "DATA ERROR IN LINE";PEEK(63)+256*PEEK
   (64):STOP
55 NEXT LI
60 PRINT"■"
65 SYS DEC("3A60")
70 NEW
75 :
1000 DATA 151,137,141,249,156,232,230,162,1458
1005 DATA 161,150,218,79,0,0,0,0,608
1010 DATA 0,0,0,0,0,0,0,0,0
1015 DATA 240,58,7,59,13,59,49,59,544
1020 DATA 63,59,76,59,117,59,138,59,630
1025 DATA 154,59,179,59,199,59,211,59,979
1030 DATA 0,0,0,0,0,0,0,0,0
1035 DATA 0,0,0,0,0,0,0,0,0
1040 DATA 0,0,0,0,0,0,0,0,0
1045 DATA 37,36,38,64,0,0,0,0,175
1050 DATA 52,60,88,60,138,60,0,61,519
1055 DATA 0,0,0,0,0,0,0,0,0
1060 DATA 169,167,160,58,141,0,3,140,838
1065 DATA 1,3,169,0,160,60,141,10,544
1070 DATA 3,140,11,3,32,79,255,18,541
1075 DATA 40,67,41,32,80,69,84,69,482
1080 DATA 82,32,70,73,78,65,78,32,510
1085 DATA 49,57,56,55,146,0,162,8,533
1090 DATA 32,196,184,169,0,133,128,169,1011
1095 DATA 132,160,3,133,126,132,127,160,973
1100 DATA 10,169,0,32,97,184,96,224,812
1105 DATA 11,240,3,76,134,134,32,121,751
1110 DATA 4,201,33,208,246,32,115,4,843
1115 DATA 240,241,160,0,217,0,58,240,1156
1120 DATA 7,200,192,24,208,246,240,227,1344
1125 DATA 24,152,42,168,185,24,58,133,786
1130 DATA 4,185,25,58,133,5,169,76,655
1135 DATA 133,3,32,115,4,32,3,0,322
1140 DATA 186,136,24,105,4,170,154,32,813
1145 DATA 121,4,76,217,139,234,234,234,1259
1150 DATA 32,225,157,132,3,133,4,32,718
1155 DATA 222,157,72,152,72,160,0,104,939
1160 DATA 145,3,200,104,145,3,96,32,728
1165 DATA 225,157,76,80,141,160,5,32,876
1170 DATA 5,137,136,165,60,145,124,136,908
1175 DATA 165,59,145,124,136,165,58,145,997
1180 DATA 124,136,165,57,145,124,136,169,1056
1185 DATA 141,145,124,32,121,4,76,7,650
1190 DATA 59,32,132,157,202,224,8,176,990
1195 DATA 3,76,44,220,76,28,153,169,769
1200 DATA 0,133,239,162,9,157,39,5,744
1205 DATA 202,16,250,96,160,0,169,12,905
1210 DATA 132,3,133,4,162,25,160,39,658
1215 DATA 177,3,73,128,145,3,136,16,681
1220 DATA 247,24,165,3,105,40,133,3,720
1225 DATA 165,4,105,0,133,4,202,208,821
1230 DATA 229,96,76,28,153,32,132,157,903
1235 DATA 224,40,176,246,138,72,32,129,1057
1240 DATA 157,104,168,224,25,176,235,76,1165
1245 DATA 57,216,32,132,157,224,2,176,996
1250 DATA 225,138,208,3,76,164,242,76,1132
1255 DATA 3,128,32,132,157,224,2,176,854
1260 DATA 209,138,240,3,169,128,44,169,1100
1265 DATA 64,141,64,5,32,129,157,142,734
1270 DATA 65,5,96,201,183,240,3,76,869
1275 DATA 134,134,32,115,4,32,225,157,833
1280 DATA 140,1,5,141,2,5,96,32,422
1285 DATA 189,184,32,129,157,76,76,184,1027
1290 DATA 76,134,134,201,76,208,249,32,1110
1295 DATA 115,4,201,68,208,242,169,8,1015
1300 DATA 160,1,145,43,32,24,136,165,706
1305 DATA 34,166,35,24,105,2,133,45,544
1310 DATA 133,47,133,49,144,1,232,134,873
1315 DATA 46,134,48,134,50,76,115,4,607
1320 DATA 169,0,133,13,32,115,4,8,474
1325 DATA 160,0,217,72,58,240,9,200,956
1330 DATA 192,8,208,246,40,76,30,148,948
1335 DATA 40,24,152,42,168,185,80,58,749
1340 DATA 133,4,185,81,58,133,5,169,768
1345 DATA 76,133,3,234,234,234,32,3,949
1350 DATA 0,76,115,4,169,0,133,3,500
1355 DATA 162,0,32,115,4,56,233,48,650
1360 DATA 201,2,176,11,201,1,38,3,633
1365 DATA 232,224,8,208,237,240,3,76,1228
1370 DATA 28,153,164,3,32,129,154,96,759
1375 DATA 162,0,32,115,4,56,233,48,650
1380 DATA 201,10,144,2,233,7,201,16,814
1385 DATA 176,229,149,208,232,224,4,208,1430
1390 DATA 233,24,165,208,10,10,10,10,670
1395 DATA 101,209,72,24,165,210,10,10,801
1400 DATA 10,10,101,211,168,104,32,118,754
1405 DATA 154,96,32,115,4,201,194,240,1036
1410 DATA 15,201,86,240,51,234,234,234,1295
1415 DATA 234,234,234,234,234,76,161,148,1555
1420 DATA 32,115,4,201,40,208,246,32,876
1425 DATA 115,4,32,225,157,132,3,133,801
1430 DATA 4,32,121,4,201,41,208,229,840
1435 DATA 160,0,177,3,72,200,177,3,792
1440 DATA 170,104,168,138,32,118,154,96,980
1445 DATA 32,115,4,201,65,208,206,32,863
1450 DATA 115,4,201,82,208,199,32,115,956
1455 DATA 4,201,40,208,192,32,115,4,796
1460 DATA 32,44,147,32,121,4,201,41,622
1465 DATA 208,179,164,71,165,72,32,118,1009
1470 DATA 154,76,121,4,234,234,234,234,1291
1475 DATA 234,234,234,234,234,234,234,234,1872
1480 DATA 32,115,4,201,131,240,27,201,951
1485 DATA 249,240,31,201,88,240,35,201,1285
1490 DATA 89,240,36,201,76,240,37,234,1153
1495 DATA 234,234,234,234,234,234,234,76,1714
1500 DATA 161,148,164,63,165,64,32,118,915
1505 DATA 154,96,164,198,169,0,32,118,931
1510 DATA 154,96,164,202,56,176,245,164,1257
1515 DATA 205,56,176,240,32,115,4,201,1029
1520 DATA 73,208,220,32,115,4,201,78,931
1525 DATA 208,213,32,115,4,201,69,208,1050
1530 DATA 206,164,57,165,58,32,118,154,954
1535 DATA 96,0,255,0,255,0,255,0,861

READY.
```

# Options

by R J Cook

Options is an Atari Basic routine that can be added to one of your own programs as a subroutine. Its purpose is to provide a list of options which can be selected with the mouse by clicking on them with the right hand button. When an option is selected the program will automatically jump to the routine you require.

The number of options is held on line 20000 and the text is held on line 20010. Line 140 deals with the places you want the option to branch off to.

Starting at line 25000 there is a sample subprogram to show how the program works.

```
List of \OPTION.BAS

   5     start :
   10    fullw 2:clearw 2 :effect=0 :gosub texteffect:clear
   15    gotoxy 5,0 :? "Menu options ";chr$(189);" RJC 1987 "
   20    gotoxy 8,2 :?"Choose option with RH button :" :effect=2 :gosu
b texteffect
   30    read times
   40    dim jump$(times) :dim words(times)
   50    for i=1 to times :read words$(i):next i:restore
   60    for i=1 to times
   70    gotoxy 8,4+i : ? words$(i) :next i
   100   loop: gosub mousebutton :if button=2 then goto 110
   105   if button=3 then goto 10 else goto 100
   110   char=int(y.pos/8):if char+1 <5 or char+1 >4+times then goto 1
00
   120   gotoxy 8,char+1:effect=0:gosub texteffect :? words$(char-3)
   140   on char-3 goto aa,bb,cc,dd
   10000 mousebutton :
   10010 poke contrl    ,124
   10020 poke contrl+2 ,0
   10030 poke contrl+6,0
   10040 vdisys
   10050 button=peek(intout)
   10060 x.pos=peek(ptsout)
   10070 y.pos=peek(ptsout+2)-38
   10080 return
   10100 texteffect :
   10110 poke contrl ,106
   10120 poke contrl+2,0
   10130 poke contrl+6,1
   10140 poke contrl+10,1
   10150 poke intin,effect
   10160 vdisys
   10170 return
   20000 data 4
   20010 data Load,Save,Eat,Kill,
   25000 '
   25010 '       Prog Start
   25020 '
   30000 aa :
   30010 clearw 2:gotoxy 10,8:?"    load selected " :goto fin
   30045 bb :
   30050 clearw 2:gotoxy 10,8:?"    save selected " :goto fin
   30095 cc :
   30100 clearw 2:gotoxy 10,8:?"    eat selected " :goto fin
   30145 dd :
   30150 clearw 2:gotoxy 10,8:?"   kill selected " :goto fin
   50000 fin:
   50005 for i=1 to 1000 :next i
   50010 ? :? " click RH button to run OPTION ";chr$(189);" again ."
   50020 gosub mousebutton
   50030 if button=2 then goto start else goto 50020
```

# Giant Text

Lee Barton

You too can have giant sized lettering on the Amstrad 6128, by using this routine. When the routine is run you are prompted for the text to print, maximum ten characters.

```
 10 MODE 2:CLS
 20 INPUT "INPUT TEXT";text$
 30 CLS:TAG:MOVE 2,15
 40 PRINT UPPER$(text$);:TAGOFF
 50 FOR a=1 TO 80
 60 FOR b=1 TO 15
 70 LET t=TEST(a,b)
 80 IF t=1 THEN GOSUB 120
 90 NEXT b,a
100 WHILE NOT bored:INK 1,INT(RND*27)
110 FOR d=1 to 1000:NEXT d:WEND
120 LOCATE a,16-b:PRINT CHR$(232)
130 RETURN
```

# Sector Counter

Ralph Lorenz

Count up the number of available sectors on a microdrive cartridge with this QL function. The syntax is *Print sec(1)*, for the info on microdrive one.

```
1000 DEFine FuNction sec(d)
1010 d$="mdv"&d&"_"
1020 f$="mdv"&d&"_df"
1030 DELETE f$
1040 OPEN_NEW #4,f$
1050 DIR #4,d$
1060 CLOSE #4
1070 OPEN_IN #4,f$
1080 INPUT #4,a$ : INPUT #4,a$
1090 CLOSE #4
1100 p="/" INSTR a$
1110 sectors= a$(1 TO p)
1120 DELETE f$
1130 RETurn sectors+1
1140 END DEFine
```

# Colour Set

Andrew Oakley

This C64 routine adds the command @ to Basic. When used it fills the colour memory with the present foreground colour. This has the effect of instantly changing any text on screen.

```
5 REM *@ COLOUR SET COMMAND BY ANDREW OAKLEY*
6 REM NB:CAN ONLY BE USED IN PROGRAMS
10 X=49152
20 READZ:IFZ>-1ANDZ<256THENPOKEX,Z:X=X+1:GOTO20
30 DATA169,76,133,115,169,13,133,116,169,192,133,117,96
40 DATA230,122,208,2,230,123,32,121,0,201,64,240,3,76,121,0,165,157,208,249,138
50 DATA72,152,72,173,134,2,162,0,157,0,216,232,208,250,157,0,217,232,208,250
60 DATA157,0,218,232,208,250,157,0,219,232,208,250,104,170,104,168,76,115,0,500
70 SYS49152:NEW
```

# Attention!

Unfortunately due to the sheer volume of submissions our returns department has been unable to cope satisfactorily. So, from now on we are requesting that you include a suitable stamped addressed envelope for return of your submission. Not enclosing a suitable SAE will mean that your program will not be returned. You have been warned.

The beneficial side of this system is that 90% of submissions will be returned within one week. A small price to pay for such a service I'm sure you'll agree.

With regards to future submissions we are looking for articles on programming in general, utility programs and applications software and lastly, good games. Here are a few types of program we don't want: Educational, hangman, pools predictors, mastermind, flashing borders, bank accounts, disc catalogues and clocks.

If you can't get a program listing in the magazine to work ring in to see whether it was faulty rather than writing. If there were problems then we'd let you know. Corrections normally appear a couple of weeks later. Thanks.

**Duncan Evans**
**Technical Editor**

# PEEK & POKE

## Monitoring the ST

*D P Rose, of Upper Norwood, London, writes:*

**Q I am thinking of buying an Atari ST, and I have a question about monitors. I have read a number of things about ST screen modes, and I understand that monochrome mode is at a resolution unique to Atari monitors.**

**However, I believe that Atari colour mode is at 'normal' high resolution and that third party monitors can be used. I am currently using a Philips 7542 paper white monochrome monitor (with a QL).**

**My question is simple: can I use this monitor with the ST? I realise that this will be at a lower resolution colour mode but I would like to know whether this would be 'usable'. Finally, should this configuration be possible, will I be at all limited in the range of software I can use?**

A The ST has four possible monitor connections, RGB (analogue), composite video 70Hz, composite video 50Hz, and RF modulator. The latter two are only available from the 'M' models (STM and STFM), and the 70Hz, as you say, requires a special monitor.

Presumably the monitor you have takes either composite video or RGB (though I was under the impression that the QL was RGB only). If it is either of these then it will work with the ST, all you need do is wire up the plug (see recent explanation of this in Peek and Poke).

Virtually all ST software comes in both low and high res formats, the most popular being the former. The only drawback with using a mono monitor with colour software is that everything is in shades of grey.

## Initial hopes for computer

*L Rogers, of Workington, Cumbria, writes:*

**Q I wonder if through your Peek & Poke column you could publish the correct interpretation of the initials used when referring to varous computers, eg, Amstrad CPC, PCW, etc, Atari ST, PC, CP/M, etc.**

A The ones you cite I know, while some computer acronyms are virtually lost in the mists of time. However, the ones I know are:

**PC:** Personal Computer
**CP/M:** Control Program for Microcomputers
**Basic:** Beginners All-purpose Symbolic Instruction Code
**Lisp:** Literally Thousands of Parentheses?
**Fortran:** Formula Translator
**MSX:** Microsoft Extended Basic
**PCW:** Personal Computer Wordprocessor (following numbers refer to memory size)

CPC stands for Colour Personal Computer, despite the mono monitor options! The 4 in 464 refers to the tape drive whereas the 6 in 664, and 6128 stands for disc. The 64 and 128 are the sizes of the respective memories.

The ST in Atari ST is popularly supposed to stand for Sam Tramiel (son of the Atari boss Jack) but Atari has always claimed that it stands for Sixteen-Thirty two, because it uses the Motorola 68000 16/32-bit processor.

## Confused calls on the MSX

*Brett Rapley, of Wythenshawe, Manchester, writes:*

**Q I am the owner of a Sony HB75B MSX computer. On the MSX and Amstrad computers there is a CALL command. Now, on the Amstrad this command can be used from Basic, eg, CALL &BC02 resets the colours on screen. However, on MSX, CALL is an extended command of a Rom cartridge. Why is this?**

**In the MSX, memory locations &HF380 to &HFFFF are reserved for system variables. What are these and can they be used from Basic in any way?**

**By the way, the MSX upgrade is available from Germany (I think) at around £90. Full details on MSXLink 0775-3433.**

A The two dialects of Basic on the MSX and the Amstrad are different in quite a few respects, one of these being CALL. On the Amstrad, it is used to make the processor jump to a machine code routine at the address given, ie, CALL &BC02 causes the processor to execute machine code from this memory location until it comes across a RET when it will return to Basic, and execute the next Basic command.

On the MSX, as you say, things are different and CALL is used to access extra Basic commands that are stored on cartridge. This allows any additional commands to be accessed by a Basic program with CALL command, arguments or command arguments.

The cartridge can be in any slot but must be in page one and has at its beginning the following ID area:

| | | |
|---|---|---|
| &H00 | ID | A 2 byte code 'AB' to indicate that the cartridge is present. |
| &H02 | INIT | The address of the cartridge initialisation routine. |
| &H04 | STATEMENT | The address of the expanded statement handler. |
| &H06 | DEVICE | Address of the expanded device handler. |
| &H08 | TEXT | The start address of a Basic program in the cartridge. |
| &H0A-&H10 | | Reserved. |

Note that not all of these need be present since the Basic startup cartridge search procedure does the following:
Checks the ID area to find out what kind of routine there is.
Executes the INIT routine, if there is one.
Executes the Basic program, if there is one.

Statement and device are not executed as they are simply additional commands for Basic. The addresses INIT and TEXT contain zero if they are not to be used, ie, the cartridge is for expanded commands, and Statement is used.

When Basic comes across a CALL in a program, it checks to see if the command is in the cartridge; if it is, then it executes it. If it's not, then a syntax error is generated.

For more information about this, plus a pretty good book about the machine, see *The Complete MSX Programmer's Guide* published by Melbourne House.

To obtain the equivalent to the Amstrad CALL, the USR command is used. Again, this is different to many Basics and works as follows:

There can be 10 machine code routines defined with DEFUSR, eg,

```
DEFUSR1=&H00C0
```

The machine code can then be called with:

```
D=USR1(0)
```

In this case, the example rings the bell and D and the zero in the argument are dummies, ie, can be anything since they are not used.

It is possible to pass arguments to and from the machine code in the following way:

The address &HF663 holds the type of the parameter, and the bytes that follow the value. So:

| | |
|---|---|
| &HF663=2 | Integer parameter<br>&HF7F8=low byte of integer<br>&HF7F9=high byte of integer |
| &HF663=4 | Single precision<br>&HF7F6-&HF7F9 and 8 digit binary coded decimal number a digit in each nibble lowest in F7F6 |
| &HF663=8 | Double precision<br>&HF7F6-&HF7FD a 16 digit BCD number starting in F7F6 |
| &HF663=3 | String<br>&HF7F8=low byte of string descripter address<br>&HF7F9=high byte of string descripter address<br>Address String length<br>Address+1 Address of string low<br>Address+2 Address of string high |

To return a parameter from machine code, the same format as above is used, ie, set up &HF663 for the right type and then fill in the correct locations with the value.

System variables are used by the operating system to store various pieces of information that are needed to keep the machine running. For instance, the colour of the border is held at &HF3EB, and the keyboard buffer at &HFBF0 (40 bytes long). The trouble is that there are rather a lot of them, far too many to list and describe. The book recommended above has a complete list, and all are available to Basic via Peek and Poke (the commands, not this column), eg, to read the current cursor position use:

```
X=PEEK(&HF3DD)
Y=PEEK(&HF3DC)
```

You can change the values with POKE but this can cause problems, so be careful.



## with Kenn Garroch

### Astronomical Mice

*Maurice Gavin, of the British Astronomers Association (Micro Users' Group), Surrey, writes:*

**Q I've written a short Basic program for my Amstrad PC, controlled entirely by the mouse, which I would like to use remotely in my observatory 150 feet from the house (I'm not prepared to move the PC).**

**The program identifies the x/y mouse coordinates on starmaps of objects being photographed and start and finish exposure times – these to be printed in real time by the printer adjacent to the PC.**

**I'm getting conflicing and generally negative responses from Amstrad Consumer Advice and knowledgeable electronic engineers and write to you for the definitive reply regarding the mouse.**

**Amstrad informs me that the mouse cable is 8 lines unscreened. I have identified that pins 1 to 4 are x/y mouse, pin 5 unused, pin 6 left hand button, pins 7 and 8 are the common and pin 9 is the right hand button.**

**Your confirmation that this is correct or otherwise would be appreciated. As only six lines plus common are used, would a 6 line screened (the latter as common) suffice? Opinions suggest that screening is needed.**

**I have bought Tandy male and female 9 pin D plugs for mouse and PC port. However, the PC objects by switching itself off, eg, needs rebooting even when the D plug is not wired to any connections. Is the metal surround to the D plug a problem? The Amstrad plug has a deeper and plastic casing.**

**A** As far as I can see, there should be 8 lines on the mouse (see diagram), although it is possible that the buttons are held high and pulled down to ground when pressed, making 7 in practice. I don't know much about the PC mouse; but, from your description, it is very similar to the ST mouse, in fact, apart from 7 and 8 being common, the connections are identical.

The best thing to try first is to get a short piece of the six core screened wire and connect the mouse to the PC via it; the metallic outer on the plug shouldn't have any effect. If this doesn't work, separate 7 and 8 and see if it works then. The reboot is due to the mouse not being present.

Having found out which wires need connecting, you will be able to connect the 150 foot extension and get the correct cable. The only problem with this extension is that the pulses from the mouse wheels, and to a lesser extent from the buttons, will lose their shape and, instead of being nicely squared, will become rounded at the edges due to the increased capacitance in the long cable.

The pulses will also lose voltage due to the cable's resistance. All these things combined could confuse the PC.

A way around these problems is to reshape the pulses when they reach the PC with a device known as a schmitt trigger. This works by taking all voltages below a certain value and assigning them to be low, and all voltages above a value to be high, thus squaring them up, and reassigning their correct values in one go.

In practice, you'll need two triggers in series since the only package I could find inverts the signal. Fortunately, the 40106BE has 6 schmitt inverters and is low current CMOS. Two of these ICs at the PC end using the mouse's 5V supply (or some other 5V source – CMOUS is very low current) should do the trick.

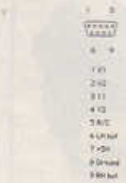
I now have to cover myself a little and say that without trying it, I don't know for sure whether this is going to work. As far as I can see, it should, although you may have to put a line driver at the observatory end to boost the signals from the mouse.

Since the most expensive part is the 150 foot cable, the best way of trying the system out without splashing out too much is to simulate 150 feet or so of cable with some capacitors and resistors. Find out the resistance per foot of the cable and the capacitance.

Obtain their equivalents, plus a bit, and attach them from each line to ground (or whatever the screen is to be). Try it first without the triggers and if it works these are redundant. Next, try it with them in circuit, hopefully it works and you can go ahead and install the 150 foot cable.



Schmitt trigger arrangement from mouse to computer at computer end



Mouse pin assignments looking into socket

I can't help feeling that it would be simpler to get a trolley for the PC and simply wheel it out to the observatory when needed.

One of the experts I consulted wondered whether you will be using the telescope to see the monitor of the PC, and presumably you will be putting in an extension for this as well. I am reliably informed that 150 foot shouldn't lose too much video signal. Please get in touch and let me know the results, if any.

### Discovery on the Discovery

*Tony V Raven, of Llanelli, Wales, writes:*

**Q I read the letter from John E Wells (Peek & Poke, June 12) concerning the Opus Discovery, with great interest, as I too had been plagued by the infamous I/O error. Yes, formatting the disc does work, but after a while even this fails.**

**I decided to strip the Discovery to see if I could find out exactly what was going on. As I am also a middle aged computer user, I made careful note of exactly what went where as I took it apart. With the drive exposed I powered up (be very careful as there's 240 volts floating around in there!) and the problem was immediately apparent, and luckily very easy to solve.**

**There is a grooved shaft coming out of the stepper motor into which fits a ball bearing held in place by a small metal plate with a hole drilled through it. This assembly changes the rotational motion of the stepper motor into the linear motion of the read/write head.**

**The problem was that the ball bearing had slipped out of the groove in the shaft, therefore the motor was turning but the head was unable to move.**

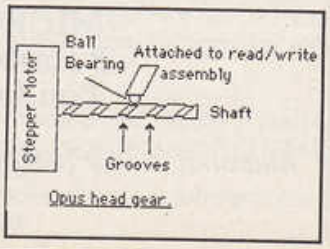
**With the aid of a small screwdriver I eased the ball back into the groove and, for good measure, spread a little of the grease already on the shaft a little more evenly.**

**It is nearly nine months since I did this and so far I have not had a single I/O error, plus the drive is now nearly silent in operation.**

**Incidentally, while you have the cover off, check to see if the joystick socket has been screwed securely to the circuit board because, if not, it will soon break loose with repeated use. Use two small screws and nuts and, for safety, you should use insulating washers on the underside of the circuit board.**

**I hope this information is of some use to your readers.**

**A** Thanks, Tony, I hope that the copy of your diagram (below) is OK. By the way, the reason why formatting works is probably due to the read/write head being moved out as far as possible and being held there to find track zero. This will eventually reseat the ball bearing in the groove, getting rid of the error, but obviously not for long.




Opus head gear.

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# UMI and the BBC as music micro

Mark Jenkins with reviews of hardware and software for the BBC, Commodore and every other micro . . .

As promised last week, I'll start with a look at the UMI3S, the new Midi interface and software for the BBC.

The 3S was born from the UMI2B, a definitely professional unit which unfortunately demanded rather a lot of expansion memory and worked out to be quite expensive. Eventually the 3S will have most of the 2B's abilities, however, and it's certainly easier to fit, having just two connectors to the 1MHz bus and User Port and offering straight Midi in and out connections.

The UMI software is on Eprom and works quite happily with disc or, using a link to bypass the DFS slots, with tape. The basic display allows you to set various default values – Clock In or Out, Midi Clock Out, Click from the internal speaker for time-keeping, variable length count-in click before recording starts, pattern length and time signature, after-touch recording (saves a lot of memory if you don't!) and so on.

The Delete key is used if you don't like a "Take," while the Return key will commit the take to memory. You can select any pattern number from one to 127 before beginning to record, and after recording a pattern you can go to the Pattern edit display which allows you to erase individual notes, play the pattern one event at a time, round off timing errors and compress or erase the modulation, bend, patch change and other data in memory.

You can then record another track in time with this one, and this can be done either in real time for a fluent performance or in step time for a regular beat. This method of working is common to many sequencers, but as we'll see, UMI does have some unusually advanced functions as well . . .

We'll complete our look at the UMI3S next week, and you can catch a complete demo at the Acorn User Show. First news of a range of add-ons ideal for the system or any other micro-controlled Midi setup.

Cheetah, who gave us the SpecDrum, the AmDrum, the Mini Interface for the same machines and more recently the MK5 Midi keyboard, look set to embarrass the musical instrument industry with an astonishing new range of products. Seemingly the MK5 – at £99 with pitch bend, patch change and full-size keys, by far the cheapest method of controlling any Midi system – must have taken off, because now Cheetah have gone mad with a whole new range of control keyboards, starting with the MK5 MKII for under £200. This unit offers 61 keys (5 octaves), 128 patch changes with easy access buttons, hold and program up footswitch sockets, octave shift, LED display and Midi output assignable to any one of the 16 available channels.

Next up is the MK5V, a similar unit which also transmits velocity information and which will cost under £280. Top of the range is the MK7VA, which has a seven octave keyboard, velocity and after-touch sensitivity, weighted keys, three programmable split points, Midi In and Thru to simplify connections, four Midi Outs, pitch bend and modulation wheels, a patch change keypad, hold and program change footswitches for less than £400.

**"Cheetah have gone mad with a whole new range of control keyboards starting with the MK5 MKII for under £200. Next up is the MK5V, which will cost under £280"**

These prices are absolutely unprecedented for this kind of equipment and offer the home micro programmer a good choice of options, depending on the degree of expression you want to put into your music. But there's more . . . the MS67 is a Midi synth module which is six-voice polyphonic but also capable of playing multi-timbrally. It has two digital oscillators per voice (based on standard Curtis Electronic Music chips used in the Prophet and other professional synths) and is rack-mountable. It has a built-in arpeggiator (to play patterns of notes held on the control keyboard automatically) and features Midi In and Midi Thru. Cost is around £250, which again is unheard-of for a unit of this kind.

There's also the MD8 digital drum machine, which plays up to eight sounds simultaneously with new sounds being loaded from a data tape. Ten sounds are provided and new tapes will become available rapidly; drums from different kits can be combined and an LCD display allows you to compose patterns. Alternatively you can compose and edit using a micro in real or step time. The drum machine stores 16 songs of up to 64 patterns each and has separate outputs for each sound; cost is well under £150 (yes, that's right – £150). The DP5 Electronic Kit is a set of five full-size drum pads which allow you to play the MD8 like a drum kit. Apparently these may have applications for other machines as well, but this isn't quite clear yet. Cost is around £160 and Cheetah's sub-£50 eight-track sequencing package for the Spectrum is still available.

The debut for all these new products is on stand N78 at the British Music Fair, Olympia, London, 31 July–2 August, with a live performance in the Apex Suite on 2 August. Clearly the new Cheetah range is aimed at pro and semi-pro musicians, but should be ideal for all micro users, and since the company have a solid micro background they'll no doubt be more receptive to micro-based queries than other companies. It looks like being a very exciting year for Cheetah and for micro music in general.

A quick letter from Chris Thorpe of Luton, who asks whether the Datel Commodore 64 Sampler works with the Sequential Circuits Midi interface. Well, apart from not being quite sure what you mean by "works with" (controls, or is controlled by, or works at the same time as?), the answer is a resounding "no". The Datel unit doesn't have any Midi facilities so certainly couldn't be played by information coming from the Interface. In any case, you couldn't plug both units into the computer at the same time – they both use the cartridge slot – and even if you used a cartridge port splitter you couldn't run both lots of software at the same time. If you write again and tell me which of these units you already have I'll come up with some alternative ideas.

*Cheetah Marketing Ltd, Norbury House, Norbury Road, Fairwater, Cardiff CF5 3AS, 0222 555525.*
*U-Music, 17 Parkfields, London SW15 6NH, 01-788 3729.*

# COMPUNET CHARGES GO DOWN

Graham Edkins brings you a thorough report on the way Compunet's new mainframe has affected the way subscribers access the system

The arrival of Compunet's new mainframe has made inevitable changes to the way that many of its subscribers access the system. Previously users had a choice of either accessing via one of six access numbers dotted about the country through which there were no off-peak connect charges or through the Istel network. The use of this is charged but for many people it worked out cheaper than paying the extra phone costs incurred by making a non-local call to the 'free' numbers. The access numbers for the users who have had to change to Istel are listed in fig. 1, the full list of access numbers is available online and offers local call access to most users.

The old 'free' numbers are now no longer available but the cost of using the Istel network has been greatly reduced to 1p per minute (+VAT). Better still, for subscribers with a 'Gold' account, there is available the option to pay a quarterly fixed fee to cover all off-peak connection charges.

There are three different types of subscription to Compunet, the cheapest is Basic which costs £9.00 per quarter but will only allow you to access the system for six hours in each quarter. The next level is Standard, this puts no time limit on your access to Compunet and also gives 500 page/days free, this costs £12.00 per quarter (a page/day is 1 page or 1K of program stored on the system for 1 day).

The top account which costs £15.00 per quarter is called Gold. With a Gold account you are given 1000 page/days free and the opportunity to buy further privileges, the most important of which is unlimited free off-peak connect for just £3.00 (+VAT) per quarter. Gold subscribers can also buy unlimited storage on Compunet for £10.00 per quarter, personalised alpha GOTOs and Banners for their area, which stay for as long as the area is 'alive', for £5.00 and £10.00 respectively. You can even have an I.D. of your choice subject to certain conditions. GOTO 'Privs' for more details.

The cost of accessing during peak times (9am to 6pm, Monday to Friday) has been cut to just 60p per hour (+VAT) if you call the London number but will cost £4.00 (+VAT) if you use any other number. An IPSS number for access from outside the UK will also be available shortly.

It is possible to recoup the cost of using Compunet by selling either programs or text frames on the system itself. When you upload anything you are given the opportunity to decide how much anyone should pay to read it or download it. Most users make no charge for their uploads but some of the bigger and more useful software is sold successfully, the distribution charge made by Compunet is 50% for text or protected programs and 40% for unprotected programs. More information on charges etc. is available on the system. GOTO 'CNET'.

The list of alpha GOTOs is now quite long and shows just what diversity of areas exists and how the network has grown. It is worth remembering that in addition to these there are many excellent areas which are still reached by page number or index instead of an alpha Goto. Multi user games are a very important part of Compunet for many of its users and the announcement that the MUG *Gods* is to become the other new game along with *Federation II* will reenforce this.

*Gods* has been available for some time as a system in its own right but as the only access number is in London it is expensive for many users to use it on a regular basis, with its availability on Compunet it will reach a wider audience and is bound to attract even those who have in the past shied away from the blood-letting and violence of other MUGS.

Finally Compunet have moved office, anyone wishing to contact them now should write or phone them at Compunet Teleservices Ltd., Sheraton Business Centre, Wadsworth Road, Perivale, Middlesex UB6 7JB. Tel. 01-997 2591.

**FIG.1**

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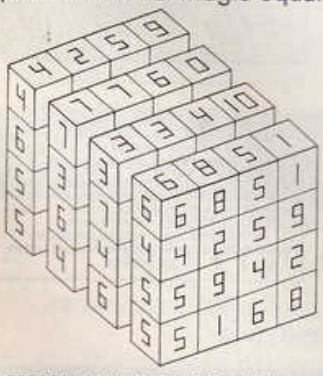
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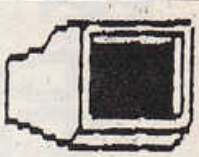
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The game of the film, converted from the ST but with an extra five screens. It's an enjoyably violent martial arts combat game, well animated and containing a variety of sampled grunts and groans. You play against the computer or against another person in two-player mode.

## Amstrad CPCs

**Program** *Game Over* **Type** Arcade **Price** £8.95 tape, £12.95 disc **Supplier** Imagine, 6 Central Street, Manchester M2 5NS.

An enjoyable and fast moving combat game, with excellent graphics, but which, like *Zynaps*, suffers from the 'go-back-to-the-start-each time-you-die' syndrome.

**Program** *Darkwurlde* **Type** Arcade **Price** £1.99 **Supplier** Top Ten Hits, 12 Chiltern Enterprise Centre, Station Road, Theale, Berkshire, RG7 4AA.




A 300 screen maze game, and a quest to hunt down some moles (!). It's all fairly standard stuff, but not bad for the price.

**Program** *Raging Beast* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.

Simple bull-fighting game that's not much to write home about.




## Atari ST

**Program** *Tracker* **Type** Strategy **Price** £24.95 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.

**Program** *K-Data* **Type** Database **Price** £49.95 **Supplier** Kuma Computers, 12 Horshoe Park, Pangbourne, Berkshire RG8 7JW.

**Program** *Gauntlet* **Type** Arcade **Price** £24.95 **Supplier** US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.

One of the biggest releases of the year for the ST market, and a bit of a disappointment.

The graphics are excellent, as you might expect, but what lets the game down is the scrolling. It's awful, especially when moving diagonally. The screen larches about and the top couple of lines on the screen start to flicker as well.

With imprecise movement control and a dreadfully slow elf (who is meant to be really fast), *Gauntlet* on the ST just doesn't match the speed of action of the original.

## Atari XL/XE

Program *Forbidden Forest* **Type** Arcade **Price** £1.99 **Supplier** Top Ten Hits, 12 Chiltern Enteprise Centre, Station Road, Theale, Berkshire RG7 4AA.

Guide your archer through the haunted forest in an attempt to confront the evil Demogorgon.

Originally released as a full-price game by Audiogenic, Forbidden Forest is starting to look a little bit dated now, although it's good value at its new price.

## Commodore

**Program** *Road Runner* **Type** Arcade **Price** £9.99 tape, £14.99 disc **Supplier** US Gold, Units 2/3 Holford Way, Holford, Birmingham B6 7AX.

See panel for comment.

**Program** *Laurel and Hardy* **Type** Arcade **Price** £9.95 **Supplier** Advance Software, Unit 1, Harold's Close, Harlow, Essex.

This month's other big licensing tie-in, and like *Road Runner* it doesn't quite capture the slapstick spirit of the original. The ingredients are there, since your main task in the

**continued on page 43 ▶**

**It's just another routine day in the life of a lieutenant of the Stellar Patrol: hop over to the space station and pick up a batch of forms.**

**You have your paperwork, draw a robot from the pool, and pilot a spacetrack over there.**

**But there's an adventure in that, is there? So it's no surprise that things start going disastrously wrong in *Stationfall*, the latest adventure from Infocom, and from the keyboard of Steve Meretzky.**

**Meretzky is the author of previous Infocom classics. *Planetfall* and *Hitchhiker's Guide to the Galaxy*, as well as the more recent *Leather Goddesses of Phobos*.**

***Stationfall* is a sequel to *Planetfall* and it was to be expected that the cute little robot in the robot pool would be Floyd, your sidekick from the earlier game.**

**Together you head off for the station, only to find it deserted. Deserted, that is, by the human crew.**

**In one of the docking bays you find a spaceship containing an alien skeleton. There's also a robot called Plato who'd rather read a poetry book than help you, and a bunch of welding machines that would rather kill you than do anything.**

**In fact it quickly becomes apparent that anything human is destined for trouble, while anything mechanical is slowly being subverted – even the otherwise adorable Floyd.**

**Finding the station commander's log will answer some questions, and raise many more, as will the chief scientist's diary, and several information tapes you'll find lying around.**

**There are, in fact, dozens of puzzles, to be solved and success requires imagination and close attention to detail. I overlooked a vital item several times before its significance dawned on me.**

**If you can gain access in the space village attached to the station you'll find many useful items and bits of information – but you may starve to death first.**

**Ultimately your goal will be to get into the lower levels of the space station, sealed off from below by some mysterious intelligence, where the vital life support machinery and master computer systems are housed.**

***Stationfall*, in my book, marks a return to excellence by Infocom. I confess to mild disappointment at recent releases like *Moonmist* and *Leather Goddesses*.**

**But this game has everything: marvellous text, cunning puzzles, and a well thought out background story. The atmosphere is terrific.**

**And, as we've come to expect from Meretzky, there's a lot of sardonic humour. If you save a game, Floyd's eyes light up and he asks: "Oh boy! Are we going to do something dangerous now?" If you attempt some fruitless action, instead of the ubiquitous "You can't do that" you're likely to get "Another move wasted".**

**One minor criticism: the program will not recognise a lot of words used in the descriptive text. It may be time for Infocom to upgrade its parser and to accommodate a larger dictionary.**

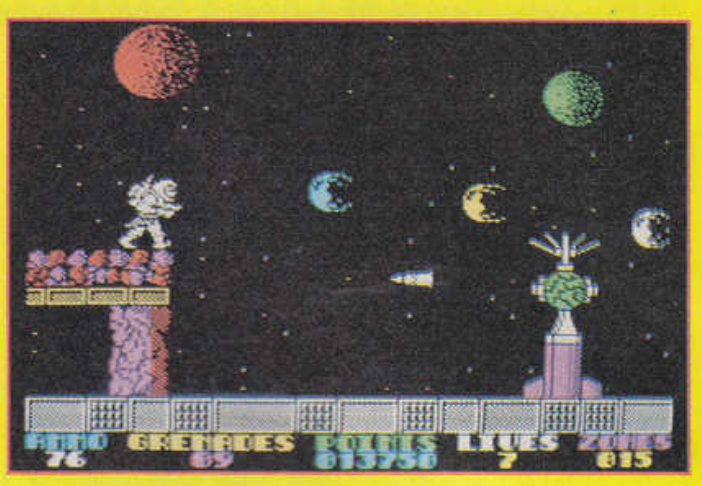
**That aside, *Stationfall* is well up to the high standards set by *Zork, Suspect, Enchanter* and other Infocom classics. An essential buy for adventure fans.**

**Peter Worlock**

Hall of Fame

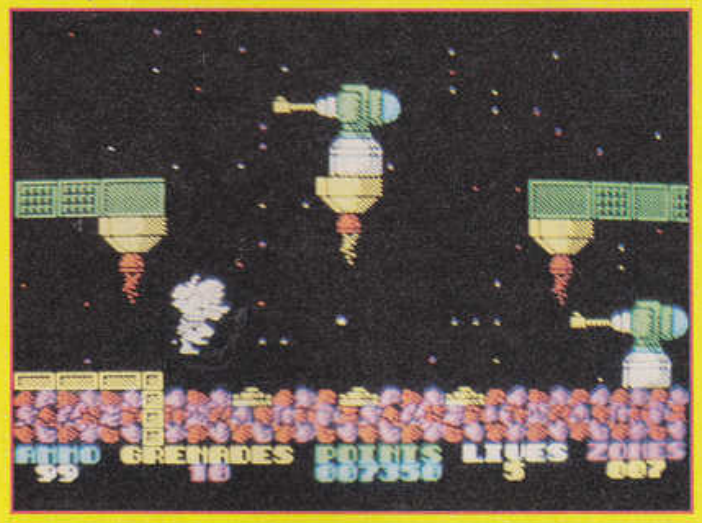
**Program** *Exolon* **Type** Arcade **Price** £7.95 **Supplier** Hewson, Hewson House, 565 Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX.

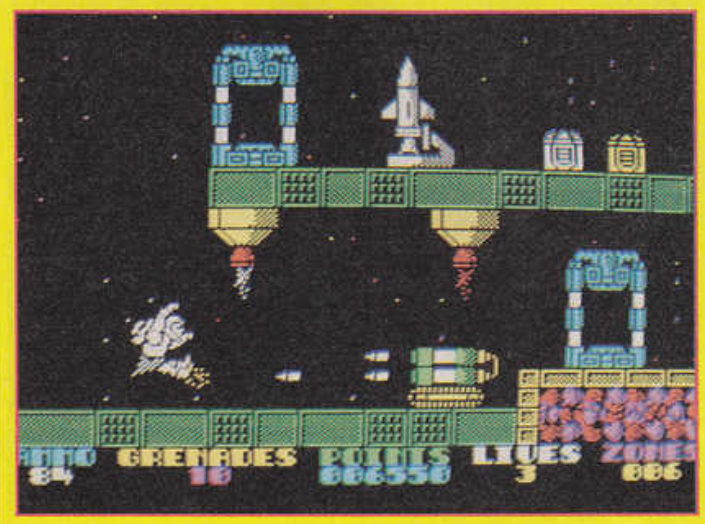
# HIT THE AL-IEN AGAIN




Ever since the success of *Uridium* there has been a constant stream of shoot 'em ups of one type or another coming out of Hewsons, and they've finally hit the alien on the head again with the release of *Exolon*.

The plot behind the game is simple to the point of being non-existent: you are a heavily-armed soldier fighting your way past waves of deadly aliens and their defence systems. Your weaponry consists of the *Exolon* exoskeleton, which gives you limited protection against attack, and limited supplies of grenades and ammunition for a hand blaster.




The blaster is used by pressing the fire button quickly, and is most effective against small moving targets, while grenades are launched from your backpack by holding the fire button down for about a second and are needed to get past larger, fixed obstacles. You'll soon run out of these grenades but spare supplies can be found on some of the screens.

The aliens themselves look suspiciously like beach balls, and wander across the screen with a slow up-and-down movement. Judging your timing to get past these, or shoot up as many as possible, is difficult enough but the chances are that you'll also have gun emplacements firing at you at the same time. These come in two types; one fires at head height and can only be destroyed if you duck below its fire and launch a grenade at it. The trouble here is that launching a grenade means you have to keep the fire button pressed for a moment or two so that you can't use your blaster, leaving you vulnerable to attack from all those aliens.

That's the easier type of gun to get past. The other type fires high-speed bullets at you at both waist and knee-height. You can't duck below these, but, if you are incredibly quick on the trigger, and duck up and down fast enough, you can actually pick the bullets out of the air with your own blaster and work your way to safety that way.

Some of the screens contain birth-pods full of little aliens (which look just like little beach balls, believe it or not). You have to blast these out of your path with a grenade, but doing so releases the young aliens who are just as deadly as their mums and dads but harder to hit because of their size.

Then there are the rockets that get launched against you, and the missiles, and the teleport pads and the land mines and . . .

Despite all this, *Exolon* probably sounds very much like a lot of other shoot 'em ups. What makes it stand out is the way that all these standard elements have been put together to make an enormously playable game.

It all starts off simply enough, and the first few screens are deceptively simple to get past – so much so that I initially thought the game probably wasn't going to be all that good. But things got better (or worse, depending on your point of view).

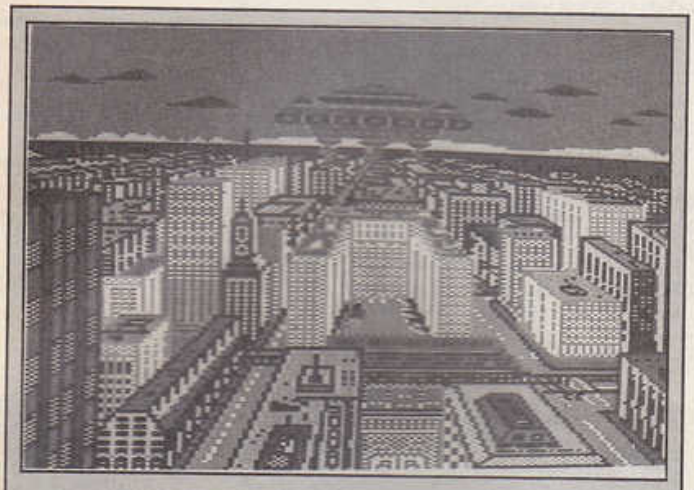
After blasting your way past a few simple obstacles just to get your trigger finger warmed up, the aliens and their mechanical defences start to gang up on you until you're reduced to a sweaty heap slouched over the keyboard and begging for mercy (or an infinite lives poke).

Some of the screens look instantly overwhelming and leave you sitting wondering where all your (nine) lives went to, but if you try again you'll find that there is a way through each screen and even if you can't actually get through on your first, second or third attempt you'll want to try again because you got so close last time and you're sure you'll be able to do it if you have just one more try . . .

Add to this Hewson's usual high standard of graphics and smooth animation and you've got the best shoot 'em up to hit the Spectrum so far this year.

**Cliff Joseph**

◀ continued from page 41



**Those of you who spent sleepless nights playing *The City*, the first part of the Alternate Reality series, will probably be ready to rush out and buy part two, *The Dungeon*.**

**This is a role playing game (RPG) in the *Dungeons and Dragons* tradition, in which you play the part of a warrior setting forth to explore the mysteries of the dungeon. Unlike more traditional games, RPGs seldom have a final goal for you to achieve, your aim being simply to survive and grow in wealth and experience as a result of your adventures. If you've played the first game in the series then you're allowed to carry your old City character over into the Dungeon and benefit from all the experience gained there. New players (armed with a blank disc for saving the game on) will have to create their characters from scratch and attempt to equip them with the weapons and such like that they'll need to survive.**

**The screen display is in three sections; the top few lines show your stats – strength, intelligence and so on. Below this is the main display which gives you a three-dimensional view of the dungeon from your character's point of view. You control your movement in the dungeon by joystick or keyboard control, and an on-screen compass shows the direction you're travelling in so that you can make a map as you go along. (Fortunately the instruction booklet provides a partial map of the first dungeon level to get you started, and there's a sketch of some of the main locations provided as well.)**

**The final part of the display shows you the various options you can choose as you encounter each new situation. When you're faced with a monster the options tend to relate to combat, but in other situations you may find yourself haggling with a merchant over equipment costs, or having a chat with some of the locals just to see if they've got any useful information to pass on.**

**My character, Fergie, got off to a bad start, with hardly any money to buy weapons or armour he picked up a disease from a rat bite then got pounded into the ground by a mere apprentice magician (the shame!). Fortunately a passing healer cured some of his wounds, simultaneously relieving him of his remaining cash.**

**There have been a few attempts at producing computer controlled RPGs, though I've always felt that the essence of these games lay in the fun of being part of a band of unpredictable human players, so that playing solo against a computer lacks that vital element of spontaneity and companionship. However, the Alternate Reality series is about the best attempt I've yet seen at putting an RPG onto a computer. The aciton is slowed down a bit by the need to constantly swop discs around on the C64 version, but it's still well worth a look if you're at all interested in RPGs.**

**Cliff Joseph**

game is to plaster your opponent with custard pies, but somehow or other the game goes adrift a bit as you seem to spend most of your time wandering around a town looking for the pies rather than flinging them at someone.




**Program** *Forbidden Forest* **Type** Arcade **Price** £1.99 **Supplier** Top Ten Hits, 12 Chiltern Enterprise Centre, Station Road, Theale, Berkshire RG7 4AA.

See Atari for comment.




**Program** *Zynaps* **Type** Arcade **Price** £8.95 tape, £14.95 disc **Supplier** Hewson, Hewson House, 56b Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX.

The C64 version of *Zynaps* is the best yet. The graphics are more detailed, and the game plays faster and more smoothly than the other versions. The only thing that I find disappointing about it is the irritating way you get sent back to the start of a level each time you get

**continued on page 44 ▶**



# NEW RELEASES

◀ continued from page 43

killed. Repeating those early stages of the game over and over soon got on my nerves, whcih is a shame because this is one of the slickest shoot 'em ups I've seen for a while.

**Program** *Zolyx* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.

**Program** *World Class Leader Board* **Type** Golf Simulation **Price** £9.95 tape, £14.95 disc **Supplier** US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.

Upgraded version of the golf game which exerts a strangely hypnotic pull on large numbers of computer owners.

**Program** *Hocus Focus* **Type** Arcade **Price** £2.99 **Supplier** Bug Byte, Victory House, Leicester Place, London WC2H 7NB.

Budget re-release of a recent Quicksilva title. It's quite a sophisticated game, but not wildly addictive.

**Program** *Core* **Type** Arcade **Price** £2.99 **Supplier** Bug Byte, Victory House, Leicester Place, London WC2H 7NB.

Another re-emerging Quicksilva title. *Core* is a large arcade adventure, that wasn't outstanding at its original price but is good value as a budget game.

**Program** *Mermaid Madness* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.




A fairly amusing Activision title that's been released as a budget game. It was overpriced when first released, but like *Core*, it makes a very good budget title.




**Program** *Hero* **Type** Arcade **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.

A simple and fairly repetitive arcade game. Another old Activision title, and one that's starting to show its age.

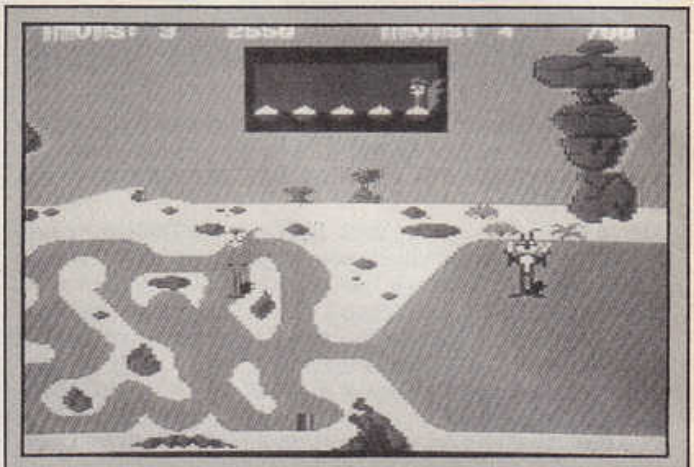
## Spectrum

**Program** *Dawnssley* **Type** Arcade **Price** £1.99 **Supplier** Top Ten Hits, Maynard International, 12 Chiltern Enterprise Centre, Station Road, Theale, Berkshire RG7 4AA.

Fairly standard maze game; collect the objects, avoid the monsters, that sort of thing.

**Program** *The Living Daylights* **Type** Arcade **Price** £9.95 **Supplier** Domark, Domark House, 22 Hartfield Road, Wimbledon SW19 3TA.

**Program** *Zenji* **Type** Strategy **Price** £1.99 **Supplier** Firebird, 64–76 New Oxford Street, London WC1A 1PS.



**The bad news is that *Road Runner* is a multi-load game, which means an awful lot of time spent rewinding the tape and waiting for each level of the game to load. In fact, I think I've spent as much time waiting for each level to load as I've spent playing the game.**

**The format of the game follows the cartoon series pretty closely; ie, Wile E Coyote chasing Road Runner along a highway. Each stretch of highway has its own dangers – falling rocks, speeding lorries, crevasses and the like – and you have to guide Road Runner past these obstacles. You can also stop along the way to eat the seeds and drink the lemonade dotted along the way, which keep up the energy levels.**

**And, of course, there's the Coyote who comes chasing after Road Runner equipped with a weird assortment of jetpacks, skateboards, pogo sticks and so on. It's a simple enough formula, and if it had been properly implemented could have been highly addictive.**

**Unfortunately the game has been split into so many small pieces by the multi-load system that you never really get into the swing of things. The individual levels are all fairly easy to master, generally containing just the one main obstacle, and just as you start to get the hang of a particular level you find that it's time to stop and load up the next. Obviously this won't be such a problem on the various disc versions, but I'm not sure that the content of the game justifies the extra cost of a disc.**

**The game isn't a total disaster by any means. There's some mild fun to be had in between loading sections of the game. The graphics are nice and cartoonish, and Road Runner moves smoothly enough, though some of the narrower sections of the road are a bit too fiddly to move smoothly along. But somehow the game never really reaches the same pitch of frantic activity that the cartoon series achieves.**

**Cliff Joseph**

# CHARTS

## Top Twenty

| | | | |
|---|---|---|---|
| 1 | (7) | Paperboy | Elite |
| 2 | (3) | Last Ninja | System 3 |
| 3 | (4) | Milk Race | Mastertronic |
| 4 | (1) | Barbarian | Palace |
| 5 | (2) | BMX Simulator | Code Masters |
| 6 | (–) | Road Runner | US Gold |
| 7 | (5) | I Ball | Firebird |
| 8 | (6) | Four Great Games | Micro Value |
| 9 | (–) | Run For Gold | Alternative |
| 10 | (8) | Football Manager | Addictive |
| 11 | (6) | Stormbringer | Mastertronic |
| 12 | (9) | Gauntlet | US Gold |
| 13 | (14) | Olympic Spectacular | Alternative |
| 14 | (15) | Army Moves | Imagine |
| 15 | (13) | Six Pak | Hit Pak |
| 16 | (–) | Head Over Heels | Ocean |
| 17 | (11) | Kik Start 2 | Mastertronic |
| 18 | (10) | Feud | Bulldog |
| 19 | (–) | Destructo | Bulldog |
| 20 | (–) | Konami's Coin-Op Hits | Imagine |

**All figures compiled by Gallup/Microscope**

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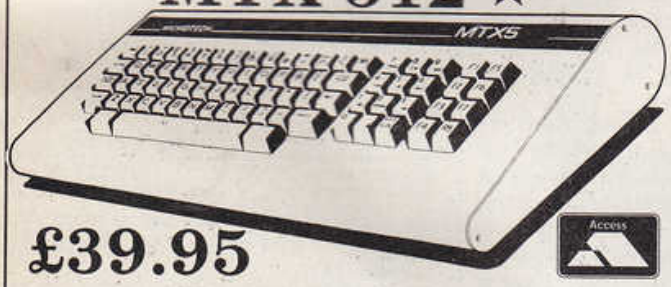
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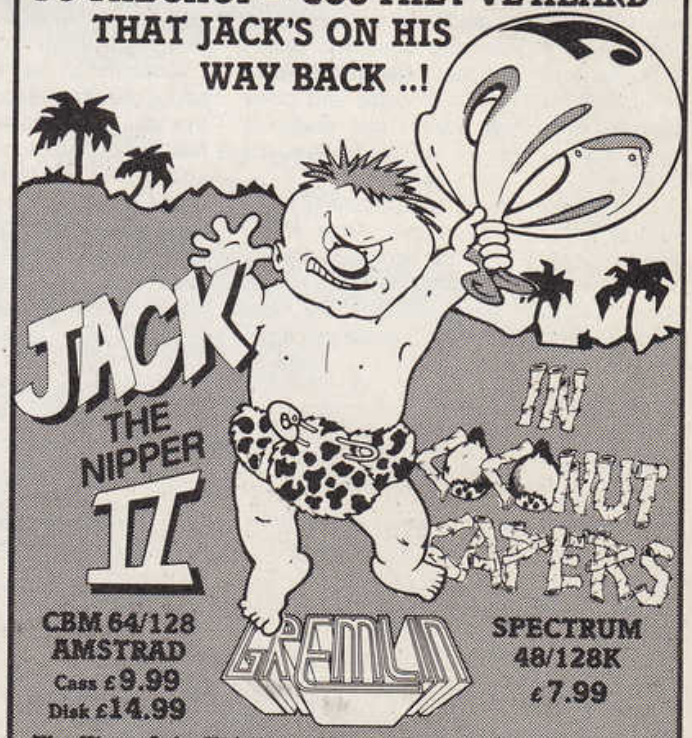
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# LANDING SOON!

**Gremlin Graphics Software Ltd., Alpha House, 10 Carver Street, Sheffield S1 4FS Tel: (0742) 753423**

# Misplaced watch

Frank went to teach in Zambia in the sixties. He returned for further training here in the early seventies, enthusing about educational technology, prophesying a great future for schooling over the air waves across the great distances of Third World countries. He visited again last month after five years with US Aid, setting up a network of satellite linked transceivers for remote mountain villages in Peru.

In a region where roads are rare and access to rural development know-how even rarer, micro-technology helps to improve the quality of life for poor campesinos. It's a pity that the PCs the agencies use for Head Office admin in Lima come from the States, rather than the emerging computer industry of neighbouring Brazil, who could do with the trade.

Digital watch chimes can be heard in ever more remote regions of rural Africa. Nomadic cattle herders still keep time by the sun and seasons, but now also enjoy the new consumer fashions. Their traditional life is threatened, though hardly by entering into new world markets. The desert is eating up their pastures. Technology which could help them understand and maybe tackle the problem is largely absent.

Prophets of the I.T. revolution saw vast stores of knowledge becoming accessible to ordinary people through the network of home and desktop computers. The micro would facilitate an electronic democracy, a pooling of resources and ideas from which all humanity might benefit. Regular features on Communications in *Popular* and other journals show how quickly this dream is being realised. But, it's only for the few, not for all.

The gigantic phone bills of some MUG addicts are a regular joke. Most micro owners can't afford the hardware investment, or the running costs. How many small businesses can really afford it? At what stage, to quote our firm's finance manager, does it become more costly to do the job without I.T. tools? Hard economics dictate that the information pecking order stays in place. The big rich guys still get most of the advantages, despite decreasing costs making new products available. And this hits hardest at the Third World.

Never mind modems, did you know that there are more telephones in Tokyo than there are in the entire continent of Africa? Ninety per cent of the world's phones belong to fifteen per cent of the world's nations. Despite the continuing reductions in the cost of electronic circuits and components, two thirds of the world's population has no access to a phone.

Only nine of the 36 of the world's lowest income countries can afford domestic satellite communications links, instead of telephone lines. Others can hardly manage existing technology let alone develop anything new. Many are still repaying the debts incurred by yesterday's attempts at industrialisation. With the notable exceptions of India, Brazil and Singapore, already deeply committed to I.T., the economic gulf separating the industrialised nations from the rest ensures that most of humanity is unlikely to benefit from the I.T. revolution when it is most needed.

Digital watches are one thing. Satellite computer networks to enable continental populations to communicate, monitor trade and environment, share ideas and collaborate to transform life in the future is another.

Competition may have encouraged many beneficial innovations, but over-competitiveness deprives us of the co-operation humanity needs to survive.

The poor are fobbed off with electronic baubles when they need tools for self reliance – I.T. and otherwise. There will be both profit and honour for those who find ways to enable two thirds of humanity to share the benefits of the global village.

**Keith Kimber**



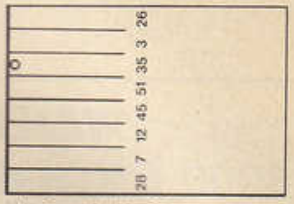
**Puzzle No 267**

Last week we left Jamie at one of the stalls in the village Summer Fete. Another of the stalls which attracted his attention was one of those roll a ball games.

"Score 100 to win!" proclaimed the sign above the stall, so Jamie paid his money and received seven ping-pong balls. These were to be rolled down the slope into the channels at the far end.

The score for each channel was marked, and as you can see, Jamie's first ball is already in place.

Can you say where he has to aim his remaining six balls if he is to win the prize?




**Solution to Puzzle No 262**

Jamie started with the number 988, and his father is 43 years old.

As the operation of reversing the digits and dividing by seven is performed three times for each starting value, this routine is entered as a subroutine (lines 170 to 210). For each starting value in the range 100 to 999, this subroutine is called three times at lines 110, 120 and 130.

In each case the number to be operated on is transferred to variable Z before going in to the subroutine, and the variable FL is used as a flag and is set within the subroutine to zero if the division by seven is exact, or to one if it is not.

Any values for which this flag remains at zero throughout are printed out at line 140.

There are just three starting values which pass this test. These are 633, 856 and 988, which result in a final value of three, one and 43 respectively. Of these, only the latter could represent the age of Jamie's father, so this is the result.

**Winner of Puzzle No 262**

This week's winner is Steve Wood, of Wombourne, Staffs, who will receive £10.

**Rules**

The closing date for Puzzle 267 is August 12.

```
100 FOR F=100 TO 999
110 Z=F:GOSUB 170:IF FL=1 THEN 150
120 Z=V:GOSUB 170:IF FL=1 THEN 150
130 Z=V:GOSUB 170:IF FL=1 THEN 150
140 IF FL=0 THEN PRINT F,V
150 NEXT F
160 END
170 Z$=STR$(Z):R$="":FL=0
180 FOR D=1 TO LEN(Z$):R$=MID$(Z$,D,1)+R$:NEXT
190 V=VAL(R$)
200 V=V/7:IF V<>INT(V) THEN FL=1
210 RETURN
>
```

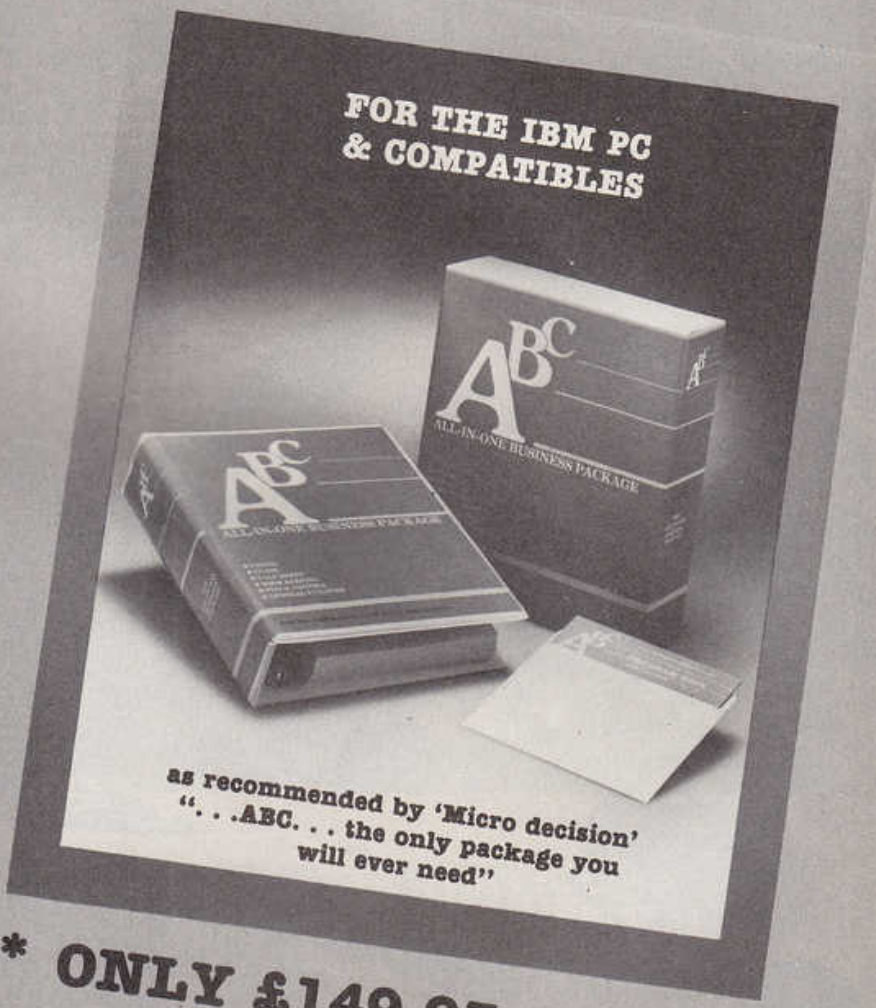




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