

40p EVERY WEEK • No 108 • APRIL 27

**PERSONAL**

**Computer**

**NEWS**

**FREE  
COMPETITION  
Win a Spectrum**



**AMSTRAD  
DOES IT AGAIN**

**AMSTRAD PROGRAMMING**

**64 PRINTING PROJECT**

**QL DISK EXPANSIONS**

**TANDY'S NEW LAP-HELD**

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# MENU

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# MONITOR

## ATARI IN LEAD



The first shots in the battle for the hearts and minds of the world's micro users were fired at the Hanover Fair last week — but so far it doesn't look like much of a battle. The Atari STs were there, as were the Commodore 128s, but Atari trumped this by announcing that its 128K version of the 400/800 series, the 130XE, would be in the shops before the end of the show.

There was no sign of the UK



C128 — not yet in the shops.

contenders and the MSX companies were concentrating more on other areas than on MSX itself, leaving Atari and Commodore to shoot it out with Atari getting very much the better of it.

Atari was operating from a modest little stand (modest compared to the IBM football pitch lookalike, that is) with Jack and Sam Tramiel in attendance. The whole range of machines and peripherals was there, headed up by the 512K 520ST, and including a few odd little numbers that Atari UK's staff hadn't heard off until they got to the show.

As promised, Digital Research's GEM system was running on the 520, but it wasn't the finished version. The first customers are to receive disk versions of the operating system (the Tramiel Operating System) rather than the built-in ROM version.

The reasoning behind this is simple. Atari promised the STs for release in September and is now claiming they will be released earlier than this. Production is starting this week, and disk versions of TOS will allow Atari to produce a standard machine while continuously upgrading the operating system. As far as the UK is concerned Atari expects around 1,500 of what are in effect beta-test machines to go out before the final ROM TOS is built in.

This could conceivably put Atari in the same position Sinclair was in over the QL, but the company is banking on getting the problems solved fast, before it loses customer goodwill, and getting the first machines out earlier than its September deadline. It was quite clear that there were a few small niggling problems with the machines on the stand. Trying to access a disk drive that wasn't connected, for example, produced no error message, and a 'friendly' operating environment should make allowances for people trying to do daft things. Other goofs produced errors of the order, ERROR 42:B DOS ERROR ON A' which again isn't particularly friendly, and one of the machines crashed for unspecified reasons.

That said, the ST series looks good. The GEM/TOS system works well, and if the rough edges are sorted out the new Atari will conquer the world simply on the basis of value for money. One of the machines, for example, was set up to work with one of the new ultra-cheap Atari hard disks and was flipping through a series of pictures at flash-card speed.

Commodore's stand, on the other hand, was over among the



JVC — MSX linked to laser disk.

business manufacturers, reflecting the company's current desire to be seen as a business machine manufacturer. The 128K version of the 64, which will run 64 software and CP/M, was at last in evidence but won't be shipped until May/June. The price in Germany will be somewhere around the £300 mark, but with the Atari 130XE at £170 in the UK it's inconceivable that this could be maintained.

The company was also show-

## ATARI'S FIRST SHOT

ing the PC10, the PC20 and the PC900. The first two are floppy and hard disk IBM compatibles respectively, and are to be priced low. But the PC compatible manufacturers are currently much more concerned with compatible-ish machines using 80186 or 80286 processors. No matter how cheap Commodore's 8088 machines turn out to be (£1,500 has been floated) they are in severe danger of looking quaintly old-fashioned.

The PC900 was Commodore's major launch for the show. It's the core of a multi-user system and is Unix System V compatible. Again it will be cheap, but with no further news on the

processor, but the PC-816F is a whole lot of machine for PC fanciers. Its CPU is an 80286 and memory is expandable to 5Mb with a maximum 1Mb on the motherboard (256K RAM chips seem to be with us). It also includes a 30Mb hard disk. The company also offered an LCD version of the basic machine. This was practically de rigueur for the Japanese companies at the show, and with Casio showing decent sized colour LCDs it's an indication that the days of the cathode ray tube are numbered.

Panasonic went one better with the JB3300, a desktop luggable incorporating a plas-

ma display. The Starlet, incidentally, is the machine NEC UK has been denying all knowledge of for some months now. It has a built-in Wordstar compatible word processor, spreadsheet, database and Telcom program.

The model at the show had a built-in modem, which should probably put the mockers on any chances of it appearing in the UK for some considerable time. NEC was also showing disk drives for this machine and the earlier 8201A. They looked a reasonable size, and had a reasonable capacity, but it's unlikely that many people will want to be bothered carrying the extra weight around.

The Apple stand was, as usual, practically impossible to get near, but a PCN snatch squad managed to get a glimpse of a few goodies. Ensemble, from Hayden Software which produces Sargon III Chess, is an integrated package including 'database', report, form, graphics, word processing and calculations.' If it does all it promises it'll be a bit like Jazz. Front Desk, an add-on desktop package from Layered Software, was also there, as was the Macadvantage UCSD Pascal system.

But GEM was also making an impression on the business market. Digital Research UK had devoted its entire stand to



Atari's 520 ST — aiming for world domination.

Amiga, which is likely to be Commodore's ST competitor, the US company may be on the point of losing the mass market by default.

The MSX companies' stands exhibited, if anything, something of a loss of interest in MSX as a home computing standard. Most of the manufacturers were displaying monitors, PC compatibles and computerised supermarket checkouts. There were MSX machines on display interfaced to laser disk systems, but it looks like these will be used mainly for mass storage in commercial environments because programming interactive videos is just too complex to make it financially worthwhile for the mass market.

JVC had an MSX machine linked to a laser disk and touch-screen monitor, and had a passable car maintenance package running on it, but admitted that its main application would be in education or industry.

The Japanese were much more convincing on the business side, with Mitsubishi a case in point. The basic Mitsubishi PC is claimed to contain a switchable speed 8088-2 micro-



NEC Starlet — shy debut for lap portable, but heavy on disks.

ma display. Plasma displays are similar to neon lights using pixel-sized bulbs, and are effectively a variation on flat LCD displays. For some reason Panasonic has chosen to attach it to a full-size machine that's as ugly as sin — it looks like an IBM PC with a big red bat on the top.

The Japanese also appeared in the form of the Tandy Model 200 and the NEC Starlet, both of which are based on a Kyocera design for an 80x16 LCD display.

the system, had something like a dozen assorted PC compatibles running it, and DR staff were promising to use it to take over the world. The first third-party application, GemWord from Lifetree Software, was there as were promises of numerous others. GemWord, incidentally, is based on Lifetree's Volkswriter Deluxe.

All this is good publicity for the Mac, but DR and Atari are beginning to look like a plausible world-domination duo.

### IN BRIEF

#### Communicating on the cheap...

BBC Micro and Commodore 64 owners looking for a cheap way into communications can look forward to a summer bonus. Tandata (06845-68421) is offering a free quarterly subscription to Prestel and Micronet to anyone who buys one of its modems and interfaces between May 1 and July 31.

The Tm110 with auto-dial and auto-recall costs about £114 inc VAT while the multi-rate Tm200 will set you back around £200.

#### ... add a bargain printer or two...

Dean Electronics, which handles the Alphacom range, has cut the price of two models for a limited period.

The Alphacom 42 gives 40 column print at the new price of £49.95 while the bigger 81 model gives 80 columns for £74.95. Both can be used with Commodore 64 and Vic 20, Atari and Acorn micros. Dean Electronics is on 0344-885661.

#### ... and you'll have a gem of a package

The Free Software Handbook is an introduction to public domain software and offers 70 programs complete with documentation for £27.95.

The programs include games, file handling utilities and business applications and add up to 1200K of code. They will run on most CP/M systems including BBC with Z80, Apple, Osborne and Epson QX10 among others. Details from Davis Rubin Associates on 0386-841181.

#### Cumana drives at smaller disks

Following the up-market trend towards smaller disk systems, Cumana has announced a range of 3.5in drives à la Macintosh and Apricot. The models range from a 128K system on single-sided, 40 track drives, up to 2Mb of storage on twin 80-track double density units. More details from 0483-503121.

#### Spectrum RGB link takes the lead

Spectrum owners looking for high-quality display have a new option in the form of an RGB interface from Lawtronics. The unit can be supplied with the correct monitor lead, and comes with instructions for connecting colour signals to the rear connector on issue 1 and issue 2 Spectrums. Issue 3 models require no modification. Price is around £45; further details from 0732-865191.



# CPC664 ADDS DRIVE

Amstrad has launched its second computer, following its earlier product policy to the letter — nothing startling, little that's new, no mistakes and a competitive price. All in all the CPC664 can only consolidate Amstrad's position in the market.

The justification for the new machine is its built-in disk drive — the 3in unit Amstrad released at the beginning of this year — which replaces the 464's cassette player. Other minor changes include a slightly modified keyboard which has seen the removal of the rather lurid blue, green and red keys. They have been replaced with a stylish powder blue set which gives the system a rather more business-like appearance.

Locomotive Basic has also been changed with enhanced graphics commands and improved error handling to cope with the complications of the disk drive.

The truly impressive aspect of the 664 is pricing. At £340 for the system with a green screen monitor and £440 for the colour version it represents exceptional value for money especially as CP/M and the excellent DR Logo are included free.

However, a couple of doubts

remain. The first concerns software compatibility with 464 programs. Although Amstrad insists that the machines are 100 per cent upwards compatible (meaning you can run 464 programs on the 664 but not vice versa), the company admits that software companies that have taken shortcuts in the operating system might experience problems. How many packages that will affect remains to be seen.

The second doubt is the choice of 3in disks. Although 3.5in disks are now widespread on

the Macintosh, Apricots and Hewlett-Packard machines, they tend to be expensive and difficult to find. The 3in disks suffer from both problems, too.

Owners of the 464 who might wish to upgrade will be pleased to know that there is a standard cassette interface at the back of the machine, and Amstrad will replace your program tapes for the price of a blank 3in disk.

The company made no announcement concerning the future of the 464 except to say that there would be no change in pricing.



## Jack could learn from Clive's mistake

On page 1 this week you can read our report on last week's Hannover Fair which leads off with a discussion of Atari's latest plans for the ST. Cutting straight to the heart of the matter, the company intends to ship unfinished, flawed systems to the first 1,500 buyers.

This news provoked us at PCN to make a few comments. First and foremost we would say to Atari: 'Don't be so damned stupid'. There is no excuse for using paying customers as beta-test sites. Atari's job is to produce working, bug-free systems — not to ship half-finished kludges with a promise to put things right later.

In any event, it's in Atari's interest to drop this half-baked scheme. As Sinclair learned to its cost, a brilliant machine on paper is worthless if you can't get it on people's desks. Sinclair's shipping of kludged QLs certainly cost it thousands of sales after magazines and first users alike panned the system.

Atari will find itself in a similar situation — with one crucial exception. Sinclair had the time to put things right and sales have now begun to approach a reasonable level. Atari has little room to manoeuvre with Gem threatening to spring up on dozens of machines and Commodore's Amiga lurking in the wings. And although Apple isn't talking price cuts, it undoubtedly has lots of room to move on Macintosh pricing.

What it comes down to is simply this: Atari has the potential to launch what promises to be the most exciting machine in years. To live up to that potential it has to have Gem, and the software and hardware will have to work.

There is another aspect to consider. A lot of people have said all along that Jack Tramiel couldn't ship working STs this summer. Two weeks ago PCN said otherwise, but we're ready to retract that.

Tramiel talks a good machine — it's time he put his product where his mouth is.



Sugar — hoping to sell 600,000 Amstrads in '85.

## Epson Taxis onto runway with QX-16

Epson is set to tackle the likes of IBM, Apple and GEM with its new QX-16 computer.

It's a fairly standard IBM compatible with an 8088 main processor, 256K RAM and two 5.25in disk drives offering 720K bytes of storage when formatted.

The exciting feature of the QX-16 is a program called Taxi which replaces the complex commands of the MSDOS operating system with icons. All operations are carried out by using a mouse, as with the Macintosh, but with the ability to run all IBM compatible software packages.

Unlike GEM, which Digital Research hopes will be licensed by many 16-bit micro manufacturers, Taxi will only run on the



The QX-16 — taxiing down the runway with icons and IBM compatibility.

QX-16. Epson claims that Taxi is far superior to GEM.

As with the Macintosh and GEM, the mouse can be used to call up many programs such as a calculator, clock, calendar, memo pad and a game, from within a standard MSDOS program.

Three complete systems will

be available: the Business system comprising Taxi, Enable and an RX-100+ printer for £2,750; the Word Processor System including Taxi, Wordstar 3.4 and a DX-100 daisy-wheel printer for £2,650; and a Graphics System with Taxi, Logistix and a Hi-80 plotter for £2,550. All prices are ex-VAT.

## TO RUSSIA WITH MEMOTECH

Memotech is finally making its move, going into the Russian and Sinclair markets. The former will hopefully take 200,000 machines, and the latter should sell a few more.

The Russian deal means that Memotech has gained permission from NATO to export machines to an Iron Curtain country for use in education. The software will be supplied by Sci-soft and generally consists of teaching programs on how to use and program microprocessors.

If the deal goes through, Memotech is hoping to export over 200,000 computers and

20,000 disk drives. The main reasons for Russia's interest in the Memotech are its educational capabilities and robust construction. Directors from Memotech have been visiting the USSR for the last couple of months.

The Sinclair tie-in involves the production of a Spectrum emulator for the Memotech 512. This will allow Memotech to easily enter the games market. The system comprises a hardware add-on (costing £30) and a software package allowing a selection of 20 games.

At the moment, the top four games in PCN's charts are

being worked on and the software, which should be available with the hardware add-on in two weeks time, will cost under £10. By the time the system is released, the other 16 games should be running.

Because of obvious machine differences, the games will only run at 80 per cent of their normal speed. The Memotech has a similar screen set-up to the Spectrum, but the keyboard and the sound outputs would have to be reconfigured to simulate the Spectrum.

However, it can be done with a neat bit of hardware and some software.



### An unusual lesson in applied computing

As debates continue about the financing of school and college computer courses, there is mounting evidence that computers are becoming a crucial part of academic life — in forging university degrees.

An investigation at the University of Southern California raised suspicions that bogus diplomas and degrees had been sold for up to \$25,000. For your money you get more than just a piece of paper, you get a complete academic record planted in the university's main computer.

How big a problem it is remains to be seen as, even in America, the numbers of students with a spare 25 grand is strictly limited.

As far back as October last year the university said it was investigating 21 students suspected of paying for a fix. A university employee was fired after admitting taking \$500 a time for the service.

The situation is such that a government sub-committee is planning to introduce legislation against any kind of record tampering, dubbed 'computer trespass'. Such offences would be deemed felonies carrying sentences of up to ten years.

None of which helps schools that are not in the relatively rich east and west coast groves of academia. In smaller mid-western communities schools are lucky to enjoy computer-to-pupil ratios of 1 to 25 as not only federal but local district budgets too are cut.

Meanwhile, in the high-profile colleges of the east coast where computer manufacturers have gone to extreme lengths to get their products into classrooms, yet another concern is raised. This time it's the local dealers who are worried.

It's not the prospect of a student buying a discounted system through the school that's the problem. It's the prospect of the student selling it to a friend or neighbour off campus, seriously undercutting the dealer's price.

### Sports talk on the 64



Barrington to serve.

Recognisable voices on your Commodore 64? New Generation is ready to add famous names to its games. First on the airwaves will be squash champion Jonah Barrington.

The company has developed a programming technique called Reprosound, and it's about the best voice reproduction we've ever heard from a micro.

Barrington's voice is used to keep track of the score and the game, Jonah Barrington's Squash, will be out soon.

### Windows on MSDOS

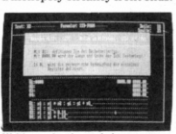


Input frame from the data files.

Microsoft's delay in getting MS-Windows out is going to cause the company problems. Already BSD (Bongarz & Schmidt Datentechnik GmbH) has announced the release of Open Window for MSDOS. Its available now for NEC's new 16-bitter, the APC III.

Open Window is a collection of development tools for applications programmers. Data can be exchanged between applications. It also offers help screens, index sequential file handling, colour and copy protection. However, mice and icons don't get a look in.

Open Window may not be much of a challenger to GEM, but it shows that Digital Research and Microsoft don't have a monopoly on fancy front ends.



Writing an invoice — help screen.

## QL BUG LIST

Sinclair has just issued the first QL Technical Newsletter. This is an informal document that will be issued to software houses quarterly.

The document contains a list of standards which programmers should follow, a list of QL bugs and, most interesting of all, details of a new QL MG ROM (turbo version?) which is currently being developed and may not be released under that name.

The list of bugs contains information which should be made available to all QL owners and not just software houses. Even bugs in the new MG ROM are detailed.

Fifty-eight different bugs are detailed and a list of the most important ones follows:

- Using input for strings which are longer than 128 characters causes a buffer full error.
- CALL can call the wrong address if more than 32K of the Basic area is used.

- Using an integer or string variable with select does not work.
  - The character '.' (full stop or point) is treated as numeric and is hence equal to 0 (zero).
  - Call to a Basic procedure which has been deleted can crash Basic. To stop this always have line 32767 STOP at the end of your program.
  - Character comparison does not work on characters whose code is greater than 128 (ie function keys).
  - GOSUB does not work in a short FOR loop.
  - Referring to mdv8\_ confuses the system.
  - RESPR can allocate as much as 512 extra bytes of memory.
  - Using more than nine local variables in a procedure can crash Basic.
  - Closing SER2 closes SER1.
- The list of standards which programmers should follow is also interesting in that the Psion programs do not follow it.

# CHARTS

# GAMES

TW	LW	TITLE	PUBLISHER	MACHINE	PRICE
1	1	Softaid	Softaid	SP, C64	£4.99
2	2	Wild Series B'ball	Imagine	SP, C64	£6.95
3	4	Spyhunter	US Gold	SP, C64	£9.95
4	3	Brian Jacks S'tar	Durrell	SP, C64, AC	£7.95
5	12	Gremlins	Adventure Int	Various	£9.95
6	10	Ghostbusters	Activision	Various	£9.99
7	7	Impossible Mission	CBS/Epyx	C64	£9.95
8	6	Bruce Lee	US Gold	SP, C64, AT	£9.95
9	—	Starion	Melbourne	SP	£7.95
10	6	Moon Cresta	Incentive	SP, C64	£6.95
11	8	Sorcery	Virgin	SP, C64, AM	£8.95
12	9	Airwolf	Elite	Various	£6.95
13	—	Grand National	Elite	SP, C64	£6.95
14	11	Dragonator	Hewson	SP	£7.95
15	13	Raid over Moscow	US Gold	SP, C64	£9.95
16	16	Pole Position	Atarisoft	Various	£9.95
17	14	Combat Lynx	Durrell	Various	£9.95
18	—	Pitstop 2	CBS/Epyx	C64	£10.95
19	15	Alien 8	Ultimate	SP	£9.95
20	17	Emerald Isle	Level 9	Various	£6.95

## SPECTRUM

TW	TITLE	PRICE
1	Softaid	£4.99
2	Spyhunter	£9.95
3	Wild Series Baseball	£6.95
4	Brian Jacks S'tar	£7.95
5	Gremlins	£9.95
6	Starion	£7.95
7	Moon Cresta	£6.95
8	Bruce Lee	£9.95
9	Grand National	£6.95
10	Dragonator	£7.95

## COMMODORE

TW	TITLE	PRICE
1	Softaid	£4.99
2	Wild Series Baseball	£7.95
3	Impossible Mission	£9.95
4	Gremlins	£9.95
5	Brian Jacks S'tar	£7.95
6	Pole Position	£9.95
7	Pitstop 2	£10.95
8	Airwolf	£6.95
9	Rocketball	£7.95
10	Super Huey	£9.95

# MICROS

## BELOW £1,000

TW	MACHINE	PRICE
1	Spectrum	£129
2	Amstrad	£349
3	CBM64	£179
4	BBCB	£399
5	Atari 800XL	£125
6	Electron	£129
7	Einstein	£499
8	CBM 16	£140
9	MSX (series)	£250
10	Sinclair QL	£399

## ABOVE £1,000

TW	MACHINE	PRICE
1	IBM PC XT	£2,349
2	ACT Apricot	£1,760
3	Compaq	£1,795
4	Olivetti M24	£1,595
5	DEC Rainbow	£2,359
6	Ericson PC	£2,095
7	Macintosh	£1,795
8	Wang Professional	£3,076
9	Televideo TS 1603	£2,640
10	Columbia	£2,065

These charts are compiled from both independent and multiple sources across the nation. They reflect what's happening in high streets during the week up to April 18. The games chart is updated every week. The prices quoted are for the no-frills model and include VAT. Information for the top-selling micros is culled from retailers and dealers throughout the country and is updated every month. PCN Charts are compiled exclusively for us by RAM-C, who can be contacted on 01-892 6596.

## CREATIVE ASSEMBLER PROGRAMMING

Z80 and/or 6502 assembler programmers are urgently required to work on graphics based entertainment and educational software.

Good salaries and good prospects are offered by a dynamic, growing software house. The jobs are permanent and based in the Cambridge area.

Telephone immediately Martin Taylor, Nick Burroughs or Barrie Brown.

## PENTAGRAM

Kiln House Yard,  
Baldock Street,  
Royston, Herts.

Telephone 0763 48818/41282

## Proteus Software

Rose Hill  
Linkside East  
Hindhead, Surrey  
Tel. (042873) 6585

## D • M • S

D-M-S, Data Management system is a disk based powerful random access data base. There are two edit modes, the first uses 3 user definable screens (80 col) per record, these screens may be laid out in any way you choose, specifying the field headings, field types (string, numeric etc), field widths and any extra characters. Data may be transferred between screens and calculations made using formulae. The second edit mode uses one screen divided into 3 sections, the middle section uses a scrolling list which may contain 6 fields across and up to 250 items in the list, the rest may be user defined as above. This section is designed for use as invoicing or estimating etc, as it also includes a fixed cost data file to make entry of an invoice or estimate fast and simple. It also includes several print modes, User Defined, List, Label, valuations, reports, list edit mode and print options. The user defined mode prints the data to user specifications including use of print fonts.

D-M-S (DATA BASE) ..... £44.95 S-FILE (Stock control) ..... £23.95  
I-FILE (Invoicing) ..... £23.95 M-FILE (Mailing) ..... £23.95

- AVAILABLE FROM SELECTED DEALERS THROUGHOUT ENGLAND.
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Link to Giant Mainframes and network to thousands of Micro users via your 'phone with free Modems and Comms software in the British Telecom Modem competition.

British  
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# MODEM COMPETITION

British Telecom is offering 1000 free gift packs to plug direct into your home 'phone line.

## 1000 FREE MODEMS

500 for Spectrum/Spectrum +  
350 for BBC Model B  
150 for Commodore 64

And if you haven't got a square-type BT phone socket, British Telecom will arrange to alter your installation at no charge!

### HOW TO ENTER

(Monday 22nd April to Sunday 5th May 6pm to midnight)

#### For the 5 questions 'phone

01-627 3000 or  
021-449 9944 or  
031-225 8999

#### To get the Tiebreaker Sentence 'phone

01-627 1199 or  
0532 455030 or  
0632 324444

Complete the entry form using your skill and judgement, and send it off in the next post.

#### RULES OF THE BRITISH TELECOM MODEM COMPETITION

- 1) The draw-in is available from 6pm Monday 22nd April to midnight Sunday 5th May 1985, when the competition closes.
- 2) Entries must be postmarked the next working day after the questions and tiebreaker were obtained.
- 3) Entries can only be made on the official entry forms and become the property of British Telecommunications plc.
- 4) The competition is open only to residents of the United Kingdom over the age of 18 years. Employees of the Network Marketing Unit of British Telecommunications plc and PARKER REDMILE LTD. and their dependants are excluded. Only one winning entry per household.
- 5) Entries not reaching the competition address before midnight on Thursday 9th May 1985 will not be considered.
- 6) A list of winners will be provided at the competition address. Please send an SAE if you wish to receive it.
- 7) The winners will be picked as follows from entries received on time and properly completed -  
The entries for each type of prize pack with all correct answers to the 5 questions and with the tiebreaker sentences judged most apt and humorous by the competition organisers will be chosen, subject to the stock of appropriate prize packs.
- 8) The decision of the competition organisers is final and no correspondence will be entered into. Winners will be notified automatically.
- 9) British Telecommunications plc offers winners requesting BT 'phone socket conversion on entry forms to waive the charge normally made for such work.
- 10) Details of how to get on Prestel/Micronet 800/Telecom Gold will be sent to winners. Subscriptions not included in prize.

### OFFICIAL ENTRY FORM

#### A. Your answers:

- Q1 .....  
Q2 .....  
Q3 .....  
Q4 .....  
Q5 .....

#### B. Tiebreaker Sentence complete (25 words or less in total):

"....."  
"....."

#### C. If I win, I would like the prize pack for the

- ☐ SPECTRUM/SPECTRUM +  
☐ BBC MODEL B (Tick Choice)  
☐ COMMODORE 64

#### D. My home telephone line (\* Delete as appropriate)

- (a) already has a square-type BT 'phone socket \* or  
(b) would need converting to square-type BT 'phone socket \*

If (b), the person renting the line from British Telecom must fill in this declaration -  
If this is a winning entry, I agree to ask British Telecom to convert my line to square-type BT 'phone socket at a convenient date before 1st July 1985. My line is on Residential rental, is not a coinbox and is not shared service.  
I understand British Telecom will not charge for doing the work.

Name ..... (Block Capitals)

Telephone number .....

Signature .....

Date ..... 1985

#### E. I have read the rules of the British Telecom Modem competition and agree to abide by them. I am over 18 years old.

Signature of entrant .....

Date ..... 1985

Name ..... (Block Capitals)

Address .....

..... Postcode .....

#### POST IMMEDIATELY TO:-

British Telecom Modem Competition  
PO BOX 73  
MITCHAM  
SURREY  
CR4 2XU

PCN 24/04

(Postage stamp required)

**WINNERS WILL BE NOTIFIED AUTOMATICALLY**

# RANDOM ACCESS



Share your words of praise or send us a rocket about PCN. We want to hear your views and feelings on the articles we print — and those you feel we ought to. Write to **Random Access, Personal Computer News, Evelyn House, 62 Oxford Street, London W1A 2HG**. You could win £15 for the best letter of the week.

## Cynical thoughts on software games

I am becoming increasingly cynical about the quality of most software. The majority — I do not exaggerate — that cost in excess of £5 are not worth the money, and for that matter neither is most budget software in the £1.99 range.

Budget software seems to consist of poor concepts shoddily executed, and probably already previously rejected by the traditional software houses.

As for the £5-plus range — some of these should be sold at £1.99, but in some cases it would still be hard to justify that price.

What of 'higher price high quality' software? Yes, what of it? The concept may be there, but what of the execution? Some so-called high quality software is full of bugs.

Doubtless some programmers will say: 'Ah, yes. Not our fault. Complex programs, y'know.' I would like to gently point out that every bug discovered by a software purchaser in use could (should?) have been found in detailed indepth pre-production testing.

It is also no use blaming bugs within the computers (real or imagined). If such faults are known they should be compensated for, surely?  
*Martin Scholes, Telford.*

## Spreading the gospel via computer

The newly-formed Christian Micro Users Association hopes to link together a large number of Christian micro users and also to promote the use of micros in church activities.

There is not only a great need to discover the few individuals and companies producing Christian software, but also to share the expertise and ideas of the many people who have sought to use micros in their church-related activities.

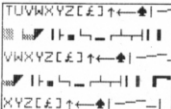
For further details and a sample magazine send a large sae to:  
Christian Micro Users Association,  
c/o 6 Walkley Street,  
Sheffield S6 3RG.  
*P.A. Clark (secretary), Sheffield.*

## Printer advice could be just the ticket

I recently asked for your advice on a suitable word processor to use with my Commodore 64 and Alphacom 81 printer. You suggested that I try Heswrite and this has turned out to be exactly what I required.

I noticed in issue 106 that John Ormes from Crew wants a printer for his 64. The Alphacom 81 supports all the Commodore graphics and is available from WH Smith for around £99 with interface. I have enclosed some odd pieces of print-outs as an example.

*DJ King, Huntingdon, York.*



## Telling tales about new technology

I wonder if any of your readers might be able to help me with a television programme which I am researching.

The programme will investigate the ways in which office automation is changing people's jobs. I am interested in hearing from people who have found their working lives

changed — for good or bad — by the introduction of new technology into their office.

The programme will look at every area of office work, including secretarial and clerical workers, managers and professionals. All replies will be treated in strictest confidence and should be sent to me at the address below.

*Lucie Hill,  
27 Swinton Street,  
London WC1X 9NW.*

## Hook-up solves Atari Centronics link

In response to the enquiry from Mr Turner of Leicester (issue 105), one of our products, called a Printerface, is a compact unit that plugs into one joystick port of any Atari computer. It provides a full 8-bit wide printer interface which will connect to any Centronics compatible printer. Disk and cassette versions are available at £33.95 and £29.95 respectively from WE Electronics, 19 North Street, Emsworth, Hants PO10 7BY.

*CR Warne,  
WE Electronics,  
Emsworth, Hants.*

## No action on Elite exchange delay

Many thanks to S Jagidar (Random Access, issue 106) for his revelation that Acorn will exchange the faulty Elite tape. Perhaps he has succeeded in obtaining a replacement tape.

I sent mine to Acornsoft on January 26, after reading this was possible in another publication. I received an acknowledgement, dated February 20, but nothing since, despite sending two letters requesting action (one of which was recorded delivery).

Perhaps Mr Jagidar could enlighten me as to what happens next — or maybe he is still waiting too?  
*Mike James, Leeds.*

## Dare I say it? Thanks Sir Clive

At the risk of giving the impression that Chris Oakes' letter (issue 105) has created a dangerous precedent in saying something nice about Sinclair, may I add two pennyworth, or, as you may see, rather more than that.

Having suffered the agonising delays of an early order of both the Spectrum and its Microdrives, it was with some foreboding that, immediately the Spectrum/Spectrum Plus upgrade was formally announced (as foreshadowed in your pages which saved me the cost of a Spectrum Plus) I bundled up the old machine and despatched it with a note of my Access number (well, one has to learn something from experience!), authorising the advertised charge of £50.

Within the week the upgraded machine was back and boy, do I mean upgraded. It responds like an issue 3 machine — it went in as an issue 1 — with some developing bugs that no longer seem to be present.

Perhaps you should withhold my name and address in case Sir C's hit squad turn up to force my old PCB back on me.

To do whatever the opposite is of adding insult to injury, Sinclair then sent me a letter to the effect that as it had rapidly reduced the price of the upgrade to £30, it was arranging to refund £20 to my Access account.

The fact that the refund in question has not appeared on my recent Access statement is neither here nor there — delayed by unexpectedly high demand or 'production difficulties', perhaps?  
*L.F. Wayman-Hales, Maidenhead, Berks.*



It's the new pinstripe finish to appeal to the well-dressed businessman.

# ROUTINE ENQUIRIES



**Suffering from circuit crunch or data dyslexia? Want some sound advice on speech synthesis or the best type of printer? Then consult the experts. But remember, no SAsEs, 'cos we can't reply personally. Address your queries to Routine Enquiries, PCN, Evelyn House, 62 Oxford Street, London W1A 2HG.**

## Two for the price of one won't work

**Q** I have a Commodore 64 and an Amstrad CPC464. Could you advise me on a good printer for under £200 that will work with both machines? Can you also tell me if I can use the same disk drive with both — if so what make?

*Ed Kay,  
London NW9*

**A** Easy bit first: you can't use one disk drive on both machines because each machine uses a different interface and operating system.

The printer question is more rewarding but not without a few potential troublespots that you should be aware of. We'd recommend the Brother M1009 as the best buy in your price range. At £199 it's all but Epson-compatible, as near standard as you're likely to get. You'll need a parallel interface to get it to work with your 64 — there are several available commercially or you could use the one detailed in our current Workbench section (issues 107 and 108).

For the Amstrad you'll have to buy a suitable cable running from the Amstrad's edge connector to a standard parallel connector. SMC Supplies on 01-441 1282 does a good one.

The major troublespot we mentioned is that the Amstrad does not use standard eight-bit protocols. It uses seven instead, which might lead to problems in some esoteric operations.

## Commodore drives cause a dilemma

**Q** I own a Commodore 64 and would like to purchase a disk drive for it. I understand that the Commodore 1541 disk drive is slow and doesn't work too well. Is there any way that I can use a 'normal' disk drive with my 64?

*Haydn Barker,  
Rotherham.*

**A** Unfortunately, Commodore seems to have the policy that if you buy its computers you must also buy its peripherals. Because of the weird design of the Commodore disk interface it is not possible to use what you refer to as a 'normal' disk interface.

There are, however, a couple of ways round this problem. RAM Electronics produces a

device, the 1541 Express, which doubles the speed at which your 1541 works. The device costs £34.95 and RAM can be contacted on 02514-5858.

The second means to an easy life requires one of the disk drives for Commodore's larger machines such as the Pet and an IEEE interface. The 8050 drive gives you around 1Mb of storage — but it's rather expensive. It should, however, be possible to buy one of the older Commodore disk drives, such as the 4040, second-hand and considerably cheaper. The IEEE interface plugs into the user port of either the user port or cartridge port rather than the standard disk port. These are both parallel interfaces which work considerably faster than the serial one issued by the 1541. Super Box 64 costs £67.85 and gives you an IEEE interface together with three cartridge slots and a reset switch. This is available from Handic Software, 5 Albert Road, Crowthorne, Berks, RG11 7LT.

## Have you got your wires crossed?

**Q** I recently bought a Microvitec Cub RGB monitor to use with my Oric 1. The monitor gives a good picture with my video recorder, but when the Oric's plugged in all I get is a diagonal rolling effect. What's the problem?

*David Watson,  
Northfield, Birmingham.*

**A** From your description it sounds as if your monitor isn't getting the frame pulse properly on the RGB Sync line. This indicates a poor connection, so check the cable connections at both ends.

Make sure that you've got the wiring diagrams the right way round, ie looking into the back of the plugs. For RGB from the Oric the pins run clockwise from 9 o'clock as follows: 1-Red, 4-Sync, 2-Green, 5-Ground, 3-Blue. Check the soldering; resoldering may cure any dry joint problems. Microvitec which doesn't sell an Oric cable, is on 0274-726500.

## Flight technique by the book

**Q** I find SubLogic's Flight Simulator II fascinating. I am running it on my Commodore SX64. Could you tell me if there are any further books

available which explain in more detail the instructions given in the Operating Handbook and Flight Manual?

*Alan Barlow,  
Thetford, Norfolk.*

**A** We don't know of any books written specifically for the SubLogic program and wouldn't really expect any. However, since *Flight Simulator II* is a genuine simulation almost any book on flying technique in small aircraft should be of value.

Your best recourse would be a visit to your local library which should have — or will be able to obtain — any number of relevant books. Manuals on instrument flight rules (IFR) should be of particular interest since they will be generally applicable.

## Getting Sanyo and QL to communicate

**Q** I need your advice on linking two machines together. Machine 1 is a standard Sinclair QL and machine 2 is a Sanyo MBC 555 with two 160K disk drives and a Brother HX15.

The Sanyo doesn't have a serial RS232 interface, but I can get one. The Sinclair has two serial ports and I have the serial printer cable from Sinclair, but I suspect that the pin-out is wrong for direct connection to the Sanyo.

Finally, what about software to enable the two to emulate each other?

The main object is for the QL to use the Sanyo disk drives and printer, and ultimately to enter the big wide world of communications via either the Sanyo or the QL.

*Kenneth Ward,  
Ashton Under Lyne.*

**A** The simplest method of connecting these two beasts together should be via an RS232 link, which you will have to get for your Sanyo. The cable you have should work, but you will probably need a null modem.

This crosses over the various cables in the lead, transmit to receive etc. You can re-wire the Sinclair cable, but this is probably more trouble than its worth.

Once you have the two connected, you will need to match the baud rates, and either write or buy some software that allows communication between the two. In its simplest form, the

software consists of a terminal program at each end.

For the Sanyo, something like *Perfect Link* will do the trick. For the QL, communications packages are quite rare. QCOM (see any of the QL news pull-outs in various magazines) provides some suitable software but it means that you will have to purchase all of the associated hardware as well.

The best, and most difficult method is to write some software that allows the QL to access the Sanyo's disks as if they were devices, ie FLP1 FLP2. From the QL end, this would mean patching the operating system. The Sanyo part is simpler, as all it has to do is receive and obey the various commands sent to it.

An almost-useable system could be written in Basic by opening a serial port on the QL and printing commands and data to it. The Sanyo end would receive and interpret the commands allowing the disks to be used. For example, the 'c' could be used to denote a command so *PRINT: "DATE"* would tell the Sanyo to open a file on drive 1 called test. Anything printed to it would then go straight into the file.

To tell the Sanyo to close the file simply send a Control Z. The Sanyo would have a Basic program that monitors the serial port and takes the correct actions depending on the instructions sent to it.

## TRS-80 user groups get a call for help

**Q** Although I own a Spectrum, I also use a TRS-80 with a disk drive and printer. The latter is seldom mentioned in the press and getting information is not easy. I wonder if there is a user's group or organisation in Britain that I could join.

*S Lane  
Banbury, Oxon.*

There certainly used to be several TRS-80 user groups scattered around the country although we don't know for sure that they are still operating — our list is some months old now. However, you could try Michael Gibbons of the Birmingham TRS-80 User Group at 1 New Street, Castle Bromwich, Birmingham B38 9AP; or Brian Pain at 24 Oxford Street, Stony Stratford, Milton Keynes.





Send your hints and tips  
to **Microwaves, PCN**  
62 Oxford Street,  
London W1A 2HG.

## Disassembler add-on relocates Spectrum

The Spectrum disassembler (issue 101) was excellent, except that it couldn't be relocated. The following 75 bytes can be added to the end of the program to enable it to be used at any address.

It works by finding out the value of the program counter and then calculating an offset from the base address (60000). A table is then worked through to find all the absolute addresses which are then patched with the offset.

Finally, a jump to the usual entry point is made and the

disassembler is run as before.

To add the code:

- 1 CLEAR 50000 and type in the loader program as before
- 2 LOAD "DISP" CODE
- 3 Run the loader program responding to the start address prompt with 61439
- 4 Enter the data below — listed in the format of the original article.
- 5 SAVE "DIS\_MK2" CODE 60000, 1514
- 6 LOAD "CODE" where addr is the desired starting address. The program is then run with PRINTUSR(addr+40). Further calls to the routine while it is still in memory should be to addr+600.

D W Arthur,  
Penicuik, Midlothian.

61439	00	21	00	5B	36	E1	23	36
61447	85	23	36	C9	CD	00	5B	AF
61455	11	0E	F0	ED	52	44	ED	21
61463	33	F0	09	EB	21	BE	EC	09
61471	7E	81	77	23	7E	88	77	1A
61479	3C	CA	B8	EC	85	6F	30	01
61487	24	13	18	EC	77	04	04	04
61495	40	1E	0D	46	05	05	0C	01
61503	01	25	72	02	71	11	07	13
61511	38	86	FF	00	00	00	00	00

## Getting graphic on the Enterprise

Graphic windows and user channels can be created easily using the Enterprise's Basic.

If the short procedure TRACE is included in a Basic program, then the line number currently being executed will

be shown at the bottom of the display. This region is not normally used by the default settings of the video pages, provided by Exos, so the trace does not corrupt the screen.

You can turn the trace off by pressing function key 8.

P J Walton,  
Hillsborough, Sheffield.

```
1000 REM EXAMPLE PROGRAM
110 CALL TRACE
120 GRAPHICS HIRSES 4
130 SET INK RND(3)+1
140 PLOT RND(979),RND(7191)
150 IF INKEY$="" THEN GOTO 130
160 FOR T=1 TO 50
170 SET PALETTE RND(255),RND(255),RND(255),RND(255)
180 NEXT T
190 END
1000 DEF TRACE
1010 SET FNEY=B*TRACE OFF+CHR$(13)
1020 SET VIDEO MODE 2
1030 SET VIDEO COLOUR 0
1040 SET VIDEO X 32
1050 SET VIDEO Y 2
1060 OPEN L1:"VIDEO:"
1070 TRACE ON TO L1
1080 DISPLAY L1:AT 26 FROM 1 TO 2
1090 END DEF
```

## Easier route to Amstrad file repeat

I read with interest the Micro-wave by B G Moore, (issue 106) about the Amstrad file repeat.

An identical method, from

Basic is:

KEY DEF 76,188,88

where 76 is the key number of the fire button, 1 indicates that it should repeat when held, and 88 is the ASCII value returned.

C J Lawson,  
Software engineer, Amsoft.



Bulletin board buddies  
should send details of new  
operations and products  
to Tony Dennis,  
PCN, 62 Oxford Street,  
London W1A 2HG.

## Commstar flies the colour graphics banner

Traditional bulletin board software has been weak in one particular area: the ability to display colour graphics. In an effort to rectify the situation AFPAS (the Association of Free Public Access Systems) issued tentative guidelines on on-line graphics and direct cursor addressing in October 1983. To my knowledge no-one has ever taken it up as a standard.

Fortunately BBC Micro owners are luckier. Commstar, the terminal program from Pace, supports graphics as part of its ability to access Prestel. Enterprising Beeb bulletin board operators like Robert O'Donnell have taken advantage of this to include colour demonstration frames for bulletin board callers to access. To do this you have to switch Commstar's filter to Off.

It looks suspiciously like on-line graphics are becoming machine-specific. PC Canada, one of the largest bulletin board systems in North America, has launched the GFX graphics system which currently only works with an IBM PC fitted with a graphics card and colour monitor.

However, it is the principle of operation that is interesting. In order to receive the graphics the user must first have the GFX graphics program resident.

The bulletin board host software then sends out a signal to check the graphics program is there. If it is, the user will see colour graphics in seconds rather than the two minutes it takes to transmit the same information as a frame (that is for 300 baud operation). PC Canada can be reached on (010 1) 416 751 3221 (voice) or 416 751 6337 (300 or 1200 baud BELL). Naturally, GFX can be downloaded if desired.

Hopefully the same principle could be adapted to apply to all micros. With the number of host bulletin board systems still below ten in the UK, it could swiftly be adopted as a standard without causing too many problems.

In fact a UK version may already have been developed.

Viewpak from Steebek Systems works with most micros that have a serial interface and will be shown at Communications London, Earls Court this week.

It has a built-in viewdata editor and the ability to send text/graphics directly to a modem at speeds up to 9600 baud. Viewpak currently has a 1200/75 internal modem but there's no reason why 300 and 1200 baud units could not be produced. Enquiries to Steebek on 0635-33009.

A couple of guys I'd like to see get more encouragement are George and Brian Lloyd. They run RBBS 24 hours a day (0376-518818). The software has been written by Brian and it runs on a Dragon 64 using the built-in RS232 interface.

The system has three disk drives, one from Dragon and a couple of Cumanas. In all Brian reckons they have about a megabyte of storage space. The board uses an auto-answer Telemode modem but can also be used with an auto-answer WS2000.

The host software is still being revised by Brian but wouldn't it be nice if he was approached by a distributor? All those Dragons could come out of mothballs again.

Following the recent demise of Stack Computers, budding Commodore 64 communicators must be looking for a suitable RS232 interface. SMC Supplies of Barnet is marketing its interface for £19.95 inc VAT. The company claims that it will work with modems. SMC can be found at 11 Western Parade, Great North Road, Barnet, Herts. Tel: 01-441 1282.

Jack Tramiel already seems to have breathed new life into Atari. These micros are now running close to Tandy and BBC Micros as Syssop's favourite choice.

Two new Atari boards have appeared and, interestingly, they are both from north of the border. Try Nick Rosser's SABBS on 0698-884804 and Ray Agostini's LBBS on 0506-38526. Both run 24 hours on 300 baud.

Tony Dennis

# EVENT BLOCK EFFECTS

Beeb users are familiar with interrupts but Amstrad users may be surprised to find they can use them, too, says J Keneally.

Ever wondered how the Amstrad does those clever EVERY...GOSUB, AFTER...GOSUB and ON,SQ,GOSUB... Basic commands? So did I until I discovered event blocks. Lurking in the depths of the operating system, they are the key to achieving some remarkable effects. They are never at rest, always waiting somewhere in a queue or being kicked about by any program that has a mind to do it. Used in the demo program to provide extended Basic commands which are defined by a Basic subroutine, they are similar to PROC functions.

Event blocks may be only seven memory bytes long, but they control all the above commands and many other machine features. They are the means by which a program can request the operating system to run a particular Basic or machine code subroutine at the appropriate time. All becomes clear when we look at the format (Figure 1).

## Event block format

The first two bytes are a chain pointer. Computer buffs will know this implies that the event block is part of a list of event blocks. Each block contains a pointer which shows where the next block is located in memory. The operating system is thus able to search the list every so often. In fact the list is searched for any 'active' blocks, ie any block which contains a request for a subroutine to run.

The next byte determines whether the block is active. When the count byte is non-zero, there are uncompleted requests. Count can go up to 127, so there may be lots of outstanding requests all waiting to run when the operating system decides it is time to do them. In deciding whether the event can be carried out, the operating system uses the class byte. As shown in Figure 1, bit 7 determines whether the event is synchronous or asynchronous. The latter are carried out almost immediately, and would normally be used for urgent or time-critical actions.

These can be used to enable a Basic program to split the VDU screen in two with a different Mode for each part, and to achieve two colour borders.

## Synchronous events

Synchronous events wait for an uncer-

## Basic listing

```

10 REM DEMO PROGRAM.
20 MEMORY 42999: INIT=43000: PGSET=43062
30 REM **Poke in machine code.**
40 a=INIT:b=0: WHILE b>0: READ b: POKE a,ABS(b): a=a+1: WEND
50 REM Machine-code data.
60 DATA 221,110,0,221,102,1,34,&60,&aB
70 DATA 33,0,0,34,&58,&aB,33,&51,&aB
80 DATA 6,2,14,&fd,17,&79,&c8,205,&ef
90 DATA &bc,1,&44,&aB,33,&4d,&aB,205
100 DATA &dl,&bc,201,221,126,0,50,&sf
110 DATA &aB,237,91,&60,&aB,205,&62
120 DATA &aB,216,34,&5b,&aB,33,&51,&aB
130 DATA 205,&f2,&bc,201,221,110,0
140 DATA 221,102,1,58,&sf,&aB,119,35
150 DATA 54,0,201,&49,&aB,195,&ie,&aB
160 DATA 67,76,&d3,0,0,0,0,0,0,0,0
170 DATA 0,0,0,0,0,0,0,0,0,0,0,42,&81,&ae
180 DATA 35,35,35,78,35,70,235,167
190 DATA 237,66,216,40,15,9,235,43,43,6
200 DATA 0,43,78,9,121,177,32,231,55
210 DATA 201,235,43,43,43,43,167,201,-1
220 REM
230 REM **Call INIT with line no. 65000
240 MODE 1: CALL INIT,65000
250 CLS: PRINT TAB(10): "DEMO PROGRAM": PRINT: PRINT "Illustrating the use of event blocks"
260 PRINT "to implement extra BASIC commands which": PRINT "can be programmed as BASIC routines."
270 PRINT: PRINT "The demo first fills the screen with"
280 PRINT "a graphics pattern, then clears it"
290 PRINT "using the three commands: -"
300 PRINT "cls, 1": PRINT "cls, 2": PRINT "and": PRINT "cls, 3"
310 PRINT "These extra command words have been": PRINT "implemented so that they call Basic"
320 PRINT "subroutine 65000 via an event block.": PRINT: PRINT "Press a key"
330 IF INKEY="" THEN 330
340 REM
350 REM s/r 500 fills the screen. The
360 REM !CLS,n command clears it in various ways.
365 REM NOTE. The ! Character in line 370 is actually a vertical bar (see text)
370 GOSUB 500: !CLS,1: GOSUB 500: !CLS,2: GOSUB 500: !CLS,3
380 STOP
500 LOCATE 1,1: FOR i=1 TO 24: PRINT STRING$(40,206);: NEXT: RETURN
65000 REM
65010 REM ****BASIC s/r called by !CLS command.
65020 i%=0: CALL PGSET,0: ON i% GOTO 65040,65060,65080
65030 RETURN
65040 TAGOFF: PRINT CHR$(23): CHR$(0):
65050 FOR i%=0 TO 320 STEP 2: PLOT 320-i%,200+i%,0: DRAW 2*i%,0: DRAW 0,-2*i%: DRAW -2*i%,0: DRAW 0,2*i%: NEXT: RETURN
65060 PAPER 0: LOCATE 1,25
65070 FOR i%=0 TO 24: PRINT "": NEXT: RETURN
65080 TAGOFF: PRINT CHR$(23): CHR$(0):
65090 FOR i%=0 TO 230 STEP 2: PLOT 0,i%+230,0
65100 DRAW 160,0: DRAW 0,-60: DRAW 160,0: DRAW 0,60: DRAW 160,0: DRAW 0,-60
65110 DRAW 160,0: PLOT 0,230-i%
65120 DRAW 160,0: DRAW 0,-60: DRAW 160,0: DRAW 0,60: DRAW 160,0: DRAW 0,-60
65130 DRAW 160,0
65140 NEXT: RETURN

```

## Machine code listing

```

CODE FOR CALLING BASIC 2/R VIA AN EXTENDED COMMAND.
ORG 43000
$BSTART ORG 0AEB1H $ADDRESS WHICH HOLDS START OF
$BASIC ADDRESS.
INITEV ORG 0BCFPH $FROM S/R TO INIT. EVENT BLOCK.
LDEXT ORG 0BCD1H $FROM S/R TO SET UP RSX.
KICKEV ORG 0BCF2H $FROM S/R TO REQUEST EVENT.
$INIT:
LD L,(IX)
LD H,(IX+1)
LD (LINE),HL
LD HL,0
$CLEAR ORG 0BCFPH $EVENT BLOCK.
LDEVL,7,H $PREPARE TO INITIALISE IT
LD B,2 $'CLASS' BYTE
LD C,0FDH $'ROM' BYTE.
LD DE,0C0FPH $FROM ROUTINE TO BE CALLED.
CALL INITEV $INITIALISE.
LD BC,CTAB $PREPARE TO INTRODUCE RSX.
LD HL,CBUF
CALL LDEXT
RET

$CLSR: $ROUTINE CALLED BY 'CLS COMMAND
LD A,(IX)
LD (PARAM),A
LD DE,(LINE)
CALL BLADR
RET C
LD (EVL+10),HL
LD HL,EVL
CALL KICKEV
RET

$POET: $ROUTINE TO RECOVER THE 'CLS PARAMETER.
LD L,(IX)
LD H,(IX+1)
LD A,(PARAM)
LD (HL),A
INC HL
LD (HL),0
RET

CTAB: $COMMAND TABLE FOR RES. SYSTEM EXT.
DEFM CTAB $ADDRESS OF COMMAND NAME TABLE.

```

tain length of time before being processed. All that happens when the event is 'kicked' is that the count is advanced by one. It is not until the operating system decides to scan the list that the event has a chance of running, and even then it runs only if all higher priority events have been done.

As you will see in Figure 1 the event priority held in bits 1 to 4 of class. When the event does run, of course, the count is reduced by one and the computer jumps to the routine whose address is given by the address and ROM bytes.

The way that address/ROM bytes are used depends on whether the routine is in RAM or ROM. If it's in RAM, bit 0 of class is zero and the 16-bit address contains the address of the routine. If the routine is in ROM, bit 0 of class must be a one.

The address and ROM bytes are then used as a three-byte address which defines which 16K ROM the routine is in, and the relative address in that ROM. Further details on these 'far' addresses can be found in Amsoft's excellent Firmware Specification, and the demonstration program shows how to call a routine in the upper ROM.

Above the event block there may be any required number of extra bytes for the routine which is called. In the demonstration program, these are used to hold a pointer to a Basic subroutine, so that the extended Basic command can call that routine.

## Adding CLS commands

To use the CLS command, type in and run the Basic listing. The routine at line 65000 which is called when the CLS command is used can be changed to provide other types of screen clearing. To type the vertical bar that precedes the command, type:

KEY DEF 69,1,97,65,124  
and press the CTRL A key.

The machine code listing provided shows how this is achieved. This is poked in by the Basic demo program and carries out these essential steps:

1 INIT routine accepts the line number of the Basic routine to be called by the extended command and loads it into LINE. It then initialises the event block (EVL), placing it on the synchronous events queue and arranging to link the event block with an upper ROM routine at address C879 hex. This is the same routine that is called by the EVERY... GOSUB... command, and is able to place a request to run a Basic routine. INIT then introduces the resident system extension table containing the CLS command to the operating system. The JP CLSR instruction ensures that the routine CLSR is called whenever a CLS command is executed from Basic.

**2** When a `|CLS` command occurs, the CLSR routine first records the parameter passed from Basic in `PARAM`. This parameter is later picked up in the first line of the Basic routine, and is used

Figure 1

0+	low byte	16-bit chain pointer
1+	high byte	
2+	count	
3+	class	
4+	low byte	16-bit s/r address
5+	high byte	
6+	ROM	
7+	user fields	

The class byte is split as follows:

- bit 0 = 0 for ROM address, 1 for RAM
- bits 1 to 4 = priority (synchronous events)
- bits 5, 6 = always zero

bit 7 = 0 for synchronous, 1 for asynchronous.

to determine the type of Clear Screen required. CLSR then locates the address of the Basic routine in memory by picking up LINE and calling S/R BLADR. Examination of BLADR will show how this works. Finally, CLSR loads this address into the user field of the event block and 'kicks' the event.

**3** Once the event has been kicked, the operating system will call the Basic routine at the earliest opportunity, namely after the `|CLS` command has finished. As you will see from the Basic listing line 65000, routine `PGET` is used to recover the parameter used in the `|CLS` command. It's easy to extend the number or type of parameter passed to include decimal numbers and strings.

# LISTEN TO THE MUSIC

Using interrupts, you can add musical routines to your programs to produce continuous background music for your games. Jonathan Temple explains how to make your BBC Micro sing.

Some professional programs now include smooth, continuous background music, even while they load from tape. It's all done with interrupts.

An interrupt occurs when a signal 'interrupts' whatever the computer is doing and, if necessary, redirects the computer to an interrupt handling routine. Once the handling routine is finished — as a rule on the BBC such routines do not last longer than two milliseconds — the computer returns to the point at which it was interrupted.

By writing your own handling routine, you can make the computer generate a sound each time it is interrupted, and produce continuous background music.

This is the basis behind the Interrupt-Driven Music routine given here. The program plays music continuously, whatever the computer is doing. So music can be played while a tape is loading or someone is playing a game.

Type the program in, save it on tape before running it and then type:

PROCcode  
CALL on

Music should then be played in the background. If it's not, reload the program and check through it until you are sure you have got everything right.

Once the music is playing, try some variations eg listing the program, or even saving it. The music will carry on regardless. To stop it press Break and then type OLD, or type:

CALL off

The routine has been designed for use in your own programs. Include the procedure near the end of your program, and the line:

PROCcode  
near the start. To switch the music on and off, use "CALL on" and "CALL off" as before.

The music supplied with the routine is nothing special — in fact it's taken straight from the user guide. To use your own tunes, you will have to change the data from line 2230 onwards.

The first number in the data should be

the number of notes in your music (up to a maximum of 255). The second and third numbers control how often the program is interrupted; in other words, the speed at which the music is played.

Try experimenting to find out which combinations of numbers best suit your music, but bear in mind that the second number must be in the range 1-255 and the third 1-65535. The numbers following — lines 2260 onwards — should be the channel number, volume, pitch and length of each note in your tune.

## Two-timers

For those that are interested, the program generates the signal for each interrupt by using the 6522 VIA's timer 2. Each time this timer counts down to zero, an interrupt is generated. The computer is then redirected through the IRQ2V vector at &206 to your handling routine (lines 1620-1890).

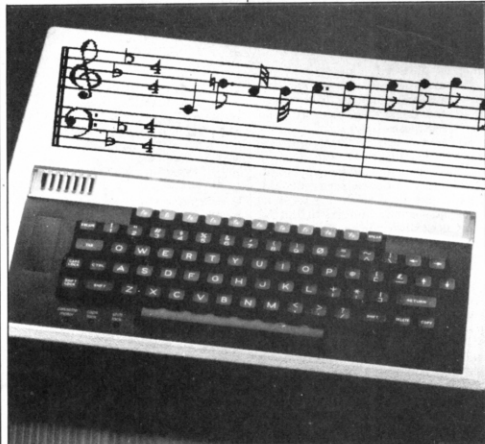
Because timer 2 is only a two byte counter, it can only time extremely short intervals, so the handling routine does not generate a sound each time it is entered. Instead, it uses a counter so that a sound is produced only every so often.

As it stands the program won't work across the tube, as it directly addresses the 6522. However, it should not be too difficult to modify the routine so that it uses the OSBYTE &96,&97 calls — user guide, page 436.

The routine was, in fact, originally written using these calls, but they are only available on OSI.0 upwards. Rather than leave OSI.1 owners out I have converted the program to direct addressing, so that the routine should work on all operating systems. ■

## Listing

```
LIST
1000 DEFPROCcode
1010 :
1020 DIM code 200,sound 7
1030 osword=&FFF1
1040 osbyte=&FFF4
1050 vector=&206
1060 :
1070 speed=&70
1080 number=&73
1090 counter=&74
1100 position=&75
1110 :
1120 READ ?number
1130 DIM channel ?number
1140 DIM volume ?number
1150 DIM pitch ?number
1160 DIM length ?number
1170 :
1180 READ speed?0
1190 READ cycles
1200 speed?1=cycles MOD 256
1210 speed?2=cycles DIV 256
1220 :
1230 FOR note=0 TO ?number-1
1240 READ channel?note
1250 READ volume?note
1260 READ pitch?note
1270 READ length?note
1280 NEXT
```



## Listing (cont)

1290 :	1630 PHP	1970 LDY #&FF
1300 FOR pass%=0 TO 2 STEP 2	1640 PHA	1980 JSR osbyte
1310 P%=code	1650 TXA	1990 CPX #15
1320 OPT pass%	1660 PHA	2000 BNE continue
1330 .on	1670 TYA	2010 LDX position
1340 LDA #0	1680 PHA	2020 LDA volume,X
1350 STA counter	1690 LDA counter	2030 STA sound+2
1360 STA position	1700 CLC	2040 LDA pitch,X
1370 LDX #7	1710 ADC #1	2050 STA sound+4
1380 .loop	1720 STA counter	2060 LDA length,X
1390 STA sound,X	1730 CMP speed+0	2070 STA sound+6
1400 DEX	1740 BNE return	2080 LDA #7
1410 BPL loop	1750 LDA #0	2090 LDX #sound MOD 256
1420 LDA #&5F	1760 STA counter	2100 LDY #sound DIV 256
1430 STA &FE6E	1770 JSR music	2110 JSR osword
1440 LDA #&A0	1780 .return	2120 INC position
1450 STA &FE6D	1790 LDA speed+1	2130 LDA position
1460 STA &FE6E	1800 STA &FE68	2140 CMP number
1470 LDA #&96	1810 LDA speed+2	2150 BNE continue
1480 STA &FE6B	1820 STA &FE69	2160 LDA #0
1490 LDA speed+1	1830 PLA	2170 STA position
1500 STA &FE6B	1840 TAY	2180 .continue
1510 LDA speed+2	1850 PLA	2190 RTS
1520 STA &FE69	1860 TAX	2200: NEXT
1530 LDA #handler MOD 256	1870 PLA	2210 ENDPROC
1540 STA vector	1880 PLP	2220 :
1550 LDA #handler DIV 256	1890 RTI	2230 DATA 5
1560 STA vector+1	1900 .music	2240 DATA 75
1570 RTS	1910 LDX position	2250 DATA 30000
1580 .off	1920 LDA channel,X	2260 DATA 1,-10,97,10
1590 LDA #&7F	1930 STA sound+0	2270 DATA 1,-10,105,10
1600 STA &FE6E	1940 EOR #251	2280 DATA 1,-10,89,10
1610 RTS	1950 TAX	2290 DATA 1,-10,41,10
1620 .handler	1960 LDA #&80	2300 DATA 1,-10,69,20

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Many chess fans find the dedicated chess computers more challenging than their home computing rivals. Tony Harrington reviews a new release.

We move away from the personal computer based programs this week to look at one of the dedicated chess computers, the TurboStar, by SciSys.

Dedicated chess computers have several advantages over the screen based variety — the most obvious is the fact that the manufacturer can use purpose built chips and ROMs to power the machine. The home computer chess program (HCCP), however, has to work with what the target computer has available.

One exception to the rule, and one that showed what could be done for HCCPs, is Psion's chess program for the Sinclair QL. But even Psion Chess, despite being built on a VAX computer, can't match the best of the DCMs.

The two types of program are beginning to be seen as complementary rather than competing for the same market. People who buy chess computers also tend to buy home computers. Invariably they then acquire one or more HCCPs which they enjoy pitting against their DCM. It's an excellent way of learning the openings and gaining an understanding of tactical play.

The four big DCM suppliers are SciSys, Novag, Fidelity and the German firm Hegener and Glasier. For the past year or so SciSys has had something of a problem. It released the SuperStar machine in early 1984 which was immediately overshadowed by considerably stronger releases from its rivals.

With the launch of the TurboStar in the early part of this year — though SciSys claims that early versions of TurboStar were available in the UK just prior to Christmas — the company seems to have produced a machine of equivalent strength to anything else on the market.

TurboStar is based on the same program as the SuperStar but has 32K of ROM instead of the latter's 24K and runs at 4MHz instead of 2MHz. At £295 the price is steeper than SuperStar's £140 tag but SciSys reckons it will fall as the dollar/sterling rate improves. SuperStar owners will be pleased to know that they can upgrade their machines into the SuperStar 36K for £50, though the machine will still run at the standard speed of 2MHz.

# PAWN BROKERS

SciSys is also marketing a plug-in 8K 'Kasparov' openings module priced between £40 and £50 to be distributed by Systema (Tel: 0734 586 429). This has been compiled by Ray Keene with the approval of Kasparov.

TurboStar has all the usual facilities including automatic replay and a flexible method for dealing with time controls which allows practically every conceivable setting, including secondary settings.

Speed chess is a popular recreation among players of all levels. If you make a mistake, the agony is over within minutes rather than hours. Computers are particularly effective for this, since quick games are very often decided by little pieces of tactics which a human can overlook. The following game extract, annotated by John Nunn, gives some idea of the level attained.

The programs are Turbostar (White) and Super Constellation (Black). White, who is about to make his 39th move, is a clear pawn up and has a powerful passed pawn at e6, advantages amply sufficient to win the game.



39 Qd3-a6

A good idea. If the queens are exchanged Black will find it impossible to stop the advance of the b-pawn, so Super Constellation correctly runs away.

39

... Qa8-d8

40 Bd2-c3?

This mistake, which makes Black a present of two whole moves, is the first sign of hesitation by Turbostar. 40 Qa6-b7 followed by Qb7-d7 was the simplest way to win.

40

... d5-d4

41 Bc3-d2

Ne7-d5

Thanks to his active knight Black has some counterplay and White's win isn't so easy.

42 Qa6-a5

Qd8-f6

43 Qa5-b5?

Another poor decision. White blocks the advance of his passed b-pawn for no good reason. 43 b4-b5 was simple and good.

43

... Nd5-f4

44 Bd2xf4

Qf6xf4

45 Qb5-c4!

Now White is on the right track again. Black threatened to draw by giving perpetual check with his queen, ie 45... Qf4-e3+ 46 Kg1-f1 Qe3-c1+ 47 Kf1-e2 Qe1-c2+ and White cannot escape the bombardment. By covering the crucial c1 square, Turbostar prevents the draw.

45

... Qf4-d2

46 e6-e7

Black has no serious threats, so White takes the opportunity to move within one square of a second queen.

46

... d4-d3

A desperate and ingenious attempt to swindle White. Black threatens mate by 47... Qd2-e1 and White must choose his counter with care.

47 h2-h4?

White falls headlong into the trap and allows Black to escape with a draw. 47 Ne5xd3? Qd2-d1+ 48 Kg1-f2 Qd1-d2+ 49 Kf2-g3 Qd2-g5+ was also bad, since Black wins the e-pawn, but 47 Qc4xd3! would have wrapped the game up.

47

... Qd2-e1+

48 Kg1-h2

e5-e4!

An original combination. Black blocks the line d4-h4 and so threatens another perpetual check, this time by 49... Qe1xh4+ 50 Kh2-g1 Qh4-e1+ etc.

49 Qc4xe4

Bg7-e5+

The second point of 48... e5-e4! is that the e5 square is cleared for the bishop. White's reply is forced.

50 f3-f4

Qe1xh4+

51 Kh2-g1

Be5-d4+

This forces a draw at once. At first sight Black could even have won the game by 51... d3-d2, but White has the spectacular defence 52 Qe4xg6+! Kh7xg6 53 e7-e8=Q+ Kg6-h7 54 Qd8-d7+ Kh7-h8 with a draw by taking at d2 or by continuing to check with the queen.

52 Qe4xd4

Qh4-e1+

53 Kg1-h2

Qe1-h4+

54 Kh2-g1

Qh4-e1+

55 Kg1-h2

Draw

## Exciting draws

The starting position of chess is slightly in White's favour because he has the first move. In practical play White scores



roughly 57 per cent to Black's 43 per cent; among top-class grandmasters it is considered a success to draw with Black against a player of equal strength.

Many of the Black opening systems employed today are designed specifically to steer the game towards a draw and when successful these openings can result in games of unrelieved tedium. Because of this, drawn games have acquired a reputation for boredom, but a draw can in fact be the natural result of a hard struggle, as in the following encounter.

White: Super Constellation (level 7)  
Black: SciSys Turbostar (level B3)

1 e2-e4 e7-e5  
2 Ng1-f3 Nb8-c6  
3 Bf1-b5 a7-a6  
4 Bb5-a4 Ng8-f6  
5 0-0 Nf6xe4

Black is playing the so-called Open Defence to the Ruy Lopez, an opening which regained some of its popularity when Korchnoi used it in his world championship matches against Karpov in 1978 and 1981.

6 d2-d4 b7-b5  
7 Ba4-b3 d7-d5  
8 d4xe5 Bc8-e6  
9 c2-c3

This move is the introduction to a plan based on Nb1-d2 and Bb3-c2, designed to displace Black's knight from e4. However, White mixes his plans by following up

with Qd1-d3 and Bc1-e3. If White wanted to adopt this plan, he should have continued 9 Bc1-e3 Bf8-e5 10 Qd1-d3 0-0 11 Nb1-c3 (this is why White should not block c3 with a pawn) with a slight plus for White, as in a game Nunn-Murei, Brighton 1983.

9 ... Bf8-e5  
10 Qd1-d3 0-0  
11 Bc1-e3 Bc5xe3

Black makes an error of move-order. As we shall see, it would have been better to play 11...f7-f6 first, when 12 e5xf6 Qd8xf6 13 Nb1-d2 (13 Bb3xd5 Ra8-d8 14 Bd5xe6+ Qf6xe6 15 Qd3-e2 Ne4xf2! 16 Kglxf2 Rd8-e8 17 Rf1-e1 Qe6-d6 gives Black enough attack for a draw) Bc5xe3 14 Qd3xe3 leads to the same position as in the game, but without allowing White the opportunity he misses at move 13.

12 Qd3xe3 f7-f6  
13 e5xf6

White should have played 13 Rf1-d1! Ne6xe5 14 Nf3xe5 f6xe5 15 Qe3xe4! d5xe4 16 Bb3xe6+ Kg8-h8 17 Rd1xd8 Ra8xd8 18 Be6-g4, since in this position the bishop and knight are worth more than a rook and a pawn.

13 ... Qd8xf6  
14 Nb1-d2 Ne4xd2  
15 Qe3xd2 Ra8-d8  
16 Bb3-c2 Be6-g4

There is nothing wrong with this move, but it would have been simpler to play 16...d5-d4 forcing more exchanges and

leading to a near-certain draw.

17 Nf3-d4 Nc6xd4  
17...Nc6-e5 was much more to the point, so as to prepare ...c7-c5 expelling the knight from d4.

18 c3xd4 Qf6-f4  
19 Qd2-c3

White should have played 19 Qd2xf4 Rf8xf4 20 f2-f3 Bg4-h5 21 Ra1-d1 Rd8-e8 22 Bc2-b3 Bh5-f7 23 Kgl-f2 with a slight advantage in the endgame because of the weak pawn at c7, which cannot be defended by another pawn.

19 ... Bg4-e2!  
Black seizes his chance; after a few twists and turns the position is revealed to be a forced draw.

20 Qc3-h3  
The rook at f1 cannot move, since Black could then capture at f2, but now White has two threats, either to take at h7 or to play Qh3-e6+ forking king and bishop.

20 ... Be2xf1  
21 Qh3xh7+ Kg8-f7  
22 Qh7-g6+ Kf7-g8  
The king cannot flee as 22...Kf7-e7 23 Ra1-e1+ Ke7-d7 24 Qg6-e6 is mate.

23 Qg6-h7+ Kg8-f7

**Draw**  
White cannot do any better than to force a draw. For example 24 Qh7-h5+ Kf7-g8 25 Bc2-h7+ Kg8-h8 and after a discovered check, the Black queen can interpose at h6, stopping the attack and giving Black a likely win. ▀

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# PRIME SUSPECT

**Mike Gerrard finds he's the number one suspect when a murder is committed at Ashcroft Farm.**

Agorilla was taking the coats at the door. A six-foot invisible rabbit began to dance. Cardinal Richelieu strolled by. Near the bar, a sheik was deep in conversation with a fairy queen while an astronaut rubbed shoulders with a vampire. A werewolf chatted up a ballerina. As a cowboy, I didn't feel too conspicuous.

It's not every day that a newspaper reporter gets invited to a very exclusive Halloween Night Fancy Dress Ball and since my editor thought there might be a good story to be had, who was I to complain?

So here I was again, caught up in yet another totally engrossing disk-based text adventure from Infocom. This new one is called *Suspect* (various micros, £35-£40) and follows in the footsteps of its illustrious whodunnit predecessors. *Deadline* and *The Witness*. *Suspect* introduces a new twist - a murder is committed and you are the prime suspect!

## Southern discomfort

The setting is Ashcroft Farm, a hundred-year old southern mansion. You play the part of a local newshound who has been invited to mingle with the upper crust by the hostess, Veronica Ashcroft-Wellmann, an old friend.

You left it late in ordering a fancy dress costume so had to take the only one left, a rather ridiculous cowboy outfit. In this company, it only stands out by reason of its relative taste.

So here you are, mixing with society's best, swigging champagne, gorging caviar and enjoying the excellent orchestra and the outlandish costumes.

However, the party fun evaporates when Veronica is strangled. You experience a slight choking discomfort yourself when you see that the murder weapon is your cowboy lariat which is still looped round her pretty neck.

Well, you know you didn't do it but the evidence is damning and, because you are a social outsider, all fingers are pointing in your direction. Get the picture? You've been framed.

You must convince the police

(by now swarming all over the place) of your innocence. The best way is to find the guilty party. Who dunnit? And why? And where's the irrefutable proof? You also have to remember that someone out there is a murderer, probably watching every move you make. Laughing at you too, most likely.

## Gruesome joke

The adventure starts in the ballroom, near the bar. The place is teeming with people. Some of the older guests are already dancing - the band played 'Breathless' - while many becostumed partygoers stand on the edge, discussing everything from politics to local scandals.

A sheik talks to Veronica, decked out as Titania, the Fairy Queen. I strolled over and joined them. Veronica is discussing an upcoming horseshow in which one of her horses will appear. *Zork* fans will be tickled by the horse's name - Lurking Grue. As a further in-joke, one of the guests comes dressed as a grue.

Veronica is clearly just a tiny bit 'tired and emotional'. Her speech is slurred and, as she waves a glass to emphasise a point, she slops the red liquid all over her white dress. Uttering a

word that lace-winged fairies are not supposed to know, she hurls her glass to the ground and stalks off.

## Follow that fairy

As I already knew that the plot centred around the bumping off of the hostess, I thought I'd be cunning and keep a close eye on her. So when she left, I followed. Infocom, as usual, was several steps ahead of me.

In hot pursuit, I reached the South Long Hall where Smythe the butler was helping a guest with his coat. Here's what happened: 'You reach the vicinity of the coat closet, but you must weave your way around the butler and a guest. Smythe is taking the guest's coat to hang it up, and the two of them are blocking the hall. The guest turns to stare at Veronica as she rushes by, and bumps you. Now Smythe, whose vision is not improved by the gorilla suit he is wearing, becomes entangled in the guest's overcoat. Unfortunately, it's still attached to the guest and the two of them fall to the floor. You are entangled in the confusion. Veronica heads off to the south.' I typed *Follow Veronica*. The response?

'You try to extricate yourself from the undignified tangle, but only succeed in confusing

matters more. Veronica, off to the south, disappears from sight to the west. *Again*. Smythe almost succeeds in reaching his feet, but the guest pulls him down again by trying to pull his coat back on. *Again*.

'You succeed in regaining your feet. Smythe regains his composure, and helps you to your feet, apologising profusely. 'I've got your costume all dirty. Permit me to straighten it.' He removes a small brush from his suit, straightens your vest, and brushes the dirt off. While Smythe is administering to your costume the other guest speeds and thankfully departs the area.'

Needless to say, after this delicious bout of slapstick, Veronica has disappeared.

## Diverting

Just this single humorous diversion highlights the amount of care, ingenuity and attention to detail which Infocom lavishes on its adventures. Where else would you find such a convincing and witty method of preventing you from taking a course of action?

*Suspect* is a superb, richly detailed and incident-packed whodunnit, possibly the best adventure yet from Infocom. Go get it.





# MODEL PERFORMANCE

The Tandy 100 set the theme for lap-held portables in the early '80s. Now Tandy has brought out a new model — the Tandy 200 — in the US. Geof Wheelwright reports



The Tandy 200 is roughly the same size as the Model 100, but features a flip-up display which is very reminiscent of the Data General One.

Two years ago Tandy turned the personal computer business — and the perception of its 'dowdy' designs — upside down with the introduction of the portable Model 100 lap-held computer. It — and the NEC 8201A Olivetti M10 variations based on that same Kyocera design — proved that something approaching a usable business computer could be run on penlight batteries and fit inside a briefcase.

A lot has happened since then. LCD screen technology has advanced beyond the 40 column by eight line displays which characterised the original Kyocera machines. Companies such as ACT, Data General and Hewlett-Packard have all introduced portable lap-held machines which not only have more powerful 16-bit processors, but can also use disk drives and 80 column displays.

Given these advances — and the recent price cuts by both Tandy and NEC (NEC's PC-8201A computer now sells for £299 and includes a free electronic mailbox subscription in that price) — it

might seem surprising that Tandy has decided to release a new lap-held with a higher price tag than its earlier machine and without the 16-bit specifications of the Data Generals and Epsos of this world. But that is exactly what it has done with its new Model 200 portable, which features a 40 character by 16 line flip-up LCD screen, more built-in software and more memory.

### First impressions

As a veteran user of both the Model 100 and NEC's PC-8201, the first thing I noticed about the Model 200 was what it had borrowed from the NEC and Olivetti variations on the Model 100.

NEC gained points for including a separate cursor keypad on the PC-8201. Tandy has borrowed this feature and included its own proper cursor-key cluster on the Model 200. Similarly, Olivetti was praised for providing an easily adjustable tilt-up screen on the M10 — and voila, there's a flip-up screen on the Model 200.

The other major criticism levelled at the Model 100 was its lack of memory compared to the NEC PC-8201. Tandy has gone some way to remedying this by borrowing NEC's bank-switching concept in the way it handles memory on the Model 200, which can hold up to 72K of RAM, held in banks of 24K which you 'switch' in and out of. The entry-level Model 200 comes with 24K RAM — three times the amount of the unexpanded Model 100.

### In use

The LCD display is almost identical to the Model 100, except larger. The date, time and copyright message that appears across the top of the display is identical to its older brother's (except for the RAM bank identifying number which follows the time), and the bottom line of the screen identifies the function keys and free RAM in the same way. Accessing the files from the screen is conducted by moving the cursor over the file name you want to open and pressing



Enter.

The keyboard has been altered slightly. Tandy has improved the function key layout by moving the Paste, Label, Print and Break/Pause keys from the right of the keyboard to the left, and has included a power-on button. It offers the same 'light touch' on the full-stroke 59-key keyboard and integral numeric pad.

Storage is provided by the built-in CMOS RAM - in one of three 24K memory banks in the fully-expanded machine. The memory is, of course, non-volatile and battery-backed and data is organised into 'RAMfiles'. These can be output through the built-in parallel or RS232 printer interfaces and printed to a file, the cassette port or the screen.

The Tandy 200 includes the same type of cassette interface as the Model 100, so any Model 100 software which doesn't operate in machine code should load on the 200. I didn't have a chance to test this, but a quick look at the Basic confirmed the machine's compatibility, except when addressing memory locations. Some software might only operate in the top eight lines of the screen, however.

Aside from the ability to run most of its Basic programs the Model 200 can also use the 100's disk/video interface. The fragile multi-pin on the Model 100 has been replaced by a discreet and much sturdier interface on the back of the Model 200, with a smaller and better connector.

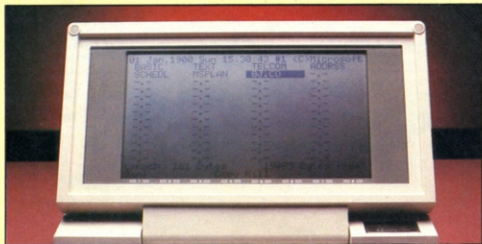
But the software that runs the disk/video interface is slightly different. An off-the-shelf disk/video interface for the 100 will need a different connecting cable and modified operating system software on the Model 200.

The usual complement of interfaces - including parallel and serial printers, a bar code reader and a cassette recorder - come on the Model 200. On the American version of the machine I looked at, there was also a built-in modem, with a connecting plug for the phone, but this will not be included on the UK version.

Internally, it will take up to three banks of 24K RAM, each accessed as an individual set of files. The word Bank has been added to the function keys, enabling you to switch from bank to bank. Like the Model 100, the 200 can also take ROM software inside the machine. Its 72K of ROM software can be boosted with an additional 32K.

### Software

There are six pieces of software with the Model 200. O BASIC is a standard implementation of Microsoft's Basic with all the proper addressing to each of the interfaces on the 200. O TEXT is a barebones word processor almost identical to that on the Model 100 but with the addition of an 'interim menu' when the PRINT option is selected. This allows you to set line length, left margin,



All available programs can be selected from the main menu which appears at power-on.

top margin, number of lines per page, spacing (through a 'number of lines to print per page' option) and a print-pausing operator for sheet-fed printers.

Page numbering, headers and footers are not supported by the new TEXT software, so there will still be a large market for all the Model 100 'formatting' programs which have popped up in the past couple of years. O TELECOM is basically the same telecommunications package Model 100 users have come to know and live with. It supports even, odd and no parity, various stop and data bit formats and a range of baud rates from 75 to 19200.

O ADDRESS and SCHEDL are an address book and a time-scheduling program which make use of database facilities built into the Model 200. Neither requires pre-set filenames for

addresses and schedules, so you can have a number of different databases to be manipulated by either program.

Finally, the latest addition is O MPLAN Microsoft's Multiplan spreadsheet in ROM.

### Verdict

The success of the Model 200 will be largely dependent on its price tag. It's a nice machine and a distinct improvement on the still-impressive Model 100 - but I'm not sure it's worth the £1000 Tandy plans to charge for it. Tandy should really move the Model 200 into the £500-£600 price region vacated by the Model 100 and NEC PC-8201.

At £1000, this pleasant portable may be overshadowed by the Epson PX-8s and NECs of this world. And that would be a shame.

### SPECIFICATIONS

Microprocessor	80C85
Speed	2.4 MHz
Memory	72K ROM expandable to 104K 24K RAM expandable to 72K
Keyboard	52 keys plus eight function keys, four command keys and four cursor keys
Display	16 x 40 LCD display
I/O	Modem, parallel, RS232, cassette and bar code reader
Price	\$999



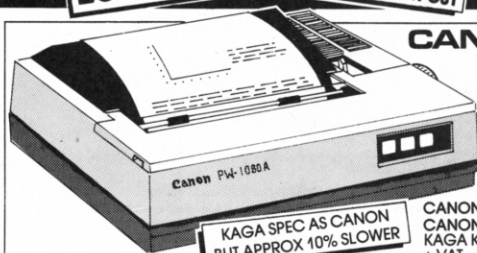
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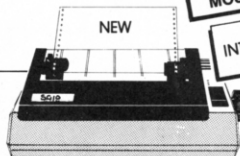
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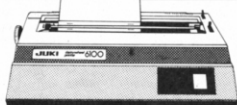


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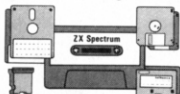
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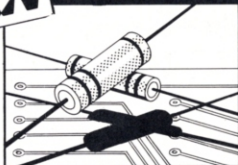
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# PROJECT 3

Put your new Commodore 64 printer interface to work with these useful listings from Richard Keeble. If you lose the program, you can use your new reset switch.



Last week I explained how to install a reset switch and build a printer interface for the Commodore 64. Now we will put them to work.

Listing 1 allows you to retrieve any program you're forced to reset by using the reset switch. Load the program whenever you're likely to require it. Press reset and type SYS 49152.

Using the printer interface is a little more complicated. The user port that the cable is plugged into is the output from a 6526 Communications Interface Adaptor (CIA).

Three registers inside the chip are of interest to us here. The first, at location 56577 (\$DD01), is the Input/Output register for port B on the CIA. This is the address that you must either poke with a number if you wish to send it out of the 64 or peek if you are reading a value in.

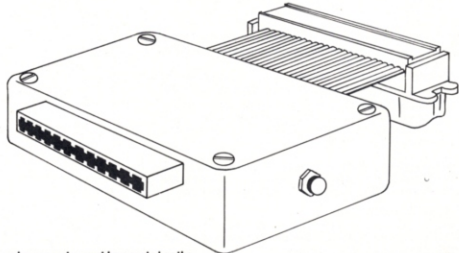
There are eight I/O lines associated with this port, and they can be used in any combination.

The computer knows which lines are for what purpose by examining the status of the Data Direction Register for Port B, held at location 56579 (\$DD03). This port has eight bits and each bit tells the computer whether the corresponding bit in the data register is an input or output. A 1 signifies that the pin is an output line and a 0 that it is an input.

So now we know how to send data out of the computer. Make sure that the DDR has 255 stored in it (this is eight ones in binary) so that all I/O lines are used as output and poke the number of the character to be printed into the data register. All we have to do now is to handle the 'handshaking' so the computer and printer know when data can and is being sent. Put the character to be sent to the printer in the Data Register for port B and then take the strobe line high and then low.

The strobe line is pin 2 of the data register for Port A on the 6526; this is at address 56576 (\$DD00). As with port B this also has a DDR which is at memory location 56578 (\$DD02), and is used in exactly the same way as the one for port B. So, you just have to make sure that bit 2 of the DDR is set to a 1 and set bit 2 to a 1 and then take it back to a 0.

Listing 2 is a simple typewriter program that demonstrates this. Listing 3 allows you to use an Epson or similar printer. The program uses the normal Commodore printer syntax. Enter it by using the Basic loader. If you press Run/Stop and Restore, you will need to re-enable the software by typing SYS 50722.



The edge connector must be mounted on the outside edge of the box.

## Wiring diagram

Centronics	CBM 64
1	M
2	C
3	D
4	E
5	F
6	H
7	J
8	K
9	L
10	B
16	A

Wiring connections between Centronics and edge connectors.

## Listing 1

```

10 FOR N=0 TO 18
20 READ A
30 POKE 49152+N,A
40 NEXT
50 DATA 169,1,141,2,8,32,51,165,
165,34
60 DATA 133,45,165,35,133,46,76,
94,166
    
```

## Listing 2

```

10 GET A$: IFA$="" THEN 10: REM INPUT A CHAR
ACTER
20 N=ASC(A$)+32: REM OUTPUT IN LOWER CASE
30 IFN<97 THEN N=N-32: GOT070: REM OUTPUT CH
R$ CODES UPTO 64
40 IFN<>165 THEN GOT070: REM F1 FOR UPPER C
ASE
50 GETA$: IFA$="" THEN 50
60 N=ASC(A$)
70 PRINTA$: REM OUTPUT TO SCREEN
80 POKE56577,N: REM PRINTER DATA TO PORT
B
90 POKE56579,255: REM PORT B DIRECTION DA
TA
100 POKE56578,255: REM DIRECTION DATA POR
T A
110 POKE56576,153: REM SET BIT 2 OF PORT
A TO 1- OUTPUT
120 POKE56576,151: REM RESTORE BIT 2 TO N
ORMAL VALUE
130 GOT010: REM RETURN TO START
    
```

## Listing

```

10 print "*****Reading data..."
11 rem clr,3*cursor down
12 print "*****Please wait..."
13 rem cursor down,red
20 for i=50432to51141:reada:pokei,ast:=a+nexti
30 if <82428 then print "typing error somewhere in data statements":end
35 print "*****Interface ready for use - type sys 5072
28to re-initialise."
36 rem white,yellow,white
40 sys50722
50 end
100 data141,12,3,165,154,201,4,240,6,173,12,3,108,
52,3,152,72,138,72,173,12
110 data3,162,0,221,110,198,240,62,232,24,3,208,2
46,41,255,48,29,201,13,240
120 data42,201,32,48,51,201,65,48,41,201,91,48,7,2
01,96,48,33,76,97,197,24
130 data105,32,76,91,197,201,160,240,8,201,193,48,
2,201,219,16,18,41,127,76
140 data91,197,169,10,32,187,197,169,13,32,187,197,
76,12,198,162,0,221,113
150 data198,240,8,232,224,34,208,246,76,12,198,169
198,133,252,169,138,133
160 data251,134,254,160,255,24,169,9,101,251,133,2
51,169,0,101,252,133,252
170 data200,196,254,208,238,169,27,32,187,197,169,
76,32,187,197,169,12,32,187
180 data197,169,0,32,187,197,160,0,177,251,32,187,
197,200,192,9,208,246,160
190 data3,169,0,32,187,197,136,208,248,76,12,198,1
41,1,221,173,0,221,170,41
200 data251,141,0,221,173,13,221,41,16,201,16,208,
247,138,141,0,221,96,224
210 data4,208,7,132,255,160,255,132,185,200,108,25
4,3,224,4,240,3,108,252,3
220 data169,0,133,144,138,166,152,202,48,5,221,89,
2,208,248,189,89,2,133,184
230 data189,99,2,133,186,133,154,189,109,2,133,185
24,96,104,170,104,168,169
240 data3,133,154,169,0,32,202,241,169,4,133,154,1

```

```

73,12,3,24,96,173,38,3,201
250 data0,240,68,141,52,3,173,39,3,141,53,3,169,0,
141,38,3,169,197,141,39,3
260 data173,26,3,141,254,3,173,27,3,141,255,3,169,
213,141,26,3,169,197,141
270 data27,3,173,32,3,141,252,3,173,33,3,141,253,3,
169,227,141,32,3,169,197
280 data141,33,3,169,255,141,3,221,96,10,15,27,133
137,134,138,139,136
290 data140,147,19,148,20,17,145,29,157,18,146,144
5,28,159,156,30,31,158,129
300 data149,150,151,152,153,154,155,222,0,222,0,22
2,0,222,0,222,246,0,246,0
310 data246,0,246,0,246,254,0,0,0,254,0,254,0,254,
254,0,254,0,254,0,0,254
320 data238,0,238,0,240,0,254,0,254,254,0,254,0,30
0,238,0,238,238,0,238,0
330 data30,0,254,0,254,254,0,2,0,250,0,250,0,250,2
34,20,138,4,194,4,138,20
340 data234,254,0,154,0,108,0,178,0,254,0,0,254,0,
254,0,254,0,254,198,0,198
350 data0,130,0,190,0,190,254,0,134,0,122,0,130,0,
252,254,0,198,0,198,0,198
360 data0,254,254,0,186,0,186,0,130,0,254,254,0,25
4,0,0,0,254,0,254,254,0,130
370 data0,166,0,218,0,254,238,0,238,0,238,0,238,0,
238,190,0,190,0,190,0,128
380 data0,254,254,0,130,0,170,0,170,0,186,234,0,13
0,0,106,0,186,0,250,62,0
390 data30,0,14,0,6,0,2,84,0,170,0,254,0,254,0,254
254,0,222,0,130,0,222,0
400 data254,238,0,198,0,238,0,238,0,238,238,0,194,
0,222,0,194,0,190,218,0,138
410 data0,2,0,138,0,218,254,0,254,0,240,0,238,0,23
8,186,0,214,0,238,0,214,0
420 data186,254,0,198,0,214,0,198,0,254,254,0,140,
0,160,0,140,0,254,254,0,254
430 data0,254,0,254,0,238,0,198,0,130,0,198,0,23
8,238,0,238,0,0,0,238,0,238
440 data255,0,255,0,255,0,255,0,255,0,255,0,255,0,
255,0,255,0,255,0,255,0,255

```

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# TREASURE QUEST

The QL comes of age at last, thanks to the latest expansion package from Quest. With the addition of 128K RAM and two 400K disk drives it becomes a good business/home computer, argues Bob Bingham.

One of the main selling points of the Sinclair QL is that people can acquire a powerful 68000 computer for a relatively small sum.

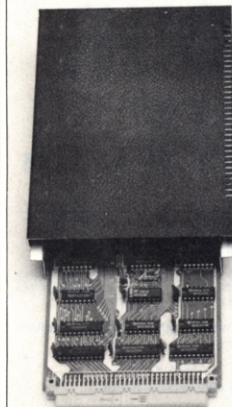
It's main drawback was the lack of fast reliable storage. But that is in the past, for Quest has produced a product line for the QL that includes CP/M 68K, disk drives, and memory expansions.

## Hardware

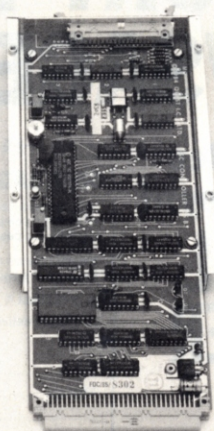
The hardware consists of a range of drives, a disk controller board, a RAM board, and an expansion console. The drives range in capacity from 200K to 800K and with the exception of the 200K unit, are based on Shugart half-height drives. They are housed in a smart plastic case (5in×7in×15in) which also contains their switched mode power supplies.



The Quest spring collection leaps into action with disk drives, disk controller and memory expansion (connected to the QL).



The memory expander and disk controller (sans case).



To use the disk drives, the device driver must be loaded from the Microdrive every time the QL is switched on or reset, which takes about 20 seconds. Once loaded, the drives can be operated from QDOS with exactly the same commands as the Microdrives, except that the device name is now FDV1—rather than MDV1—

It is possible to move complete Microdrives to disk by altering the clone program so all references to MDV2—read FDV1—

Once on disk, the improvement in performance is quite significant, especially with any software that needs to access mass storage frequently. Copying individual files from Microdrive to disk is performed with the normal copy command, as both MDV and FDV are known to the system.

After the drudgery and uncertainty of using Microdrives, the disk drives are a joy. The Quest drive is well integrated with QDOS, and operates well throughout the tests.

A detachable ribbon cable connects the drive to its controller, an expansion card that plugs into the left hand side of the QL. The bit sticking out the side is covered by a black pressed aluminium box, in the same style as the rest of Quest's kit.

Inside is a Western Digital floppy disk controller chip capable of running 8in, 5.25in, 3.5in, and 3in drives. This board also contains the ROM switch required for the CP/M 68K operating system.

The disk drive system comes complete

with a Microdrive cartridge containing the device driver needed to control the disks and any software using them under QDOS. On version 1.02, there is also a utility that allows CP/M 68K to read QDOS files.

The memory expansion board uses Texas 64K memory modules, allowing up to 512K of RAM. The boards are available in different sizes from 64K at about £100, to the 512K maximum at about £500.

There is also a useful piece of software available that allows the memory expansion to be used as a RAM disk. This package emulates the Microdrive, or disk drive, in RAM. Rather than waiting for the Microdrive to find your file, and load it into the QL's drive buffer, it is available almost instantaneously and is then placed in the drive buffer. If you have all of the memory expansion, this facility makes things a lot easier.

The review expansion was the top-of-the-line 512K model. My only major problem was inserting it into the QL. On the first attempt, I inadvertently bent some of the pins on the QL's expansion connector. With a little patience and practice, this can be overcome, but it is a matter of technique — something not documented in the manual.

Apart from this minor hitch, the board worked faultlessly. The extra memory greatly improves the QL in terms of the size of programs that can be run and increased workspace.

The real power of the memory expansion is realised when it is used with the RAM disk software. Abacus loaded from RAM in about ten seconds, and once the program was running, a help screen appeared in about three seconds — about the same speed as the floppy disk drives.

As with a Microdrive, the RAM disk must be formatted before use, and any programs must be cloned from Microdrive to RAM disk. This takes about two minutes. Unless the RAM disk package has been configured to set itself up from Microdrive in boot-up, this can prove a little awkward.

To use the disk drives and the additional memory at the same time, you need the expansion console. This allows up to four expansion cards to be mated simultaneously with the QL, leaving room for the extra power supply needed when operating more than one expansion from the QL.

At the time of writing this review, the expansion consoles weren't available, but at Quest in Camberley I was given a 'hands on' look at the final prototype. The unit was demonstrated with a JM version of the QL's ROM which still had some bugs in it, but it worked well with a variety of expansion cards and their associated firmware.

## Software

The CP/M 68K is supplied either on two 5.25in disks, or five Microdrive cartridges. A ROM comes on either the disk

controller card, or a special OS card for the Microdrive version. This is used to disable QDOS while CP/M 68K is running and is automatically switched in and out as necessary, hence the name switch ROM.

The CP/M is advertised by Quest as offering 'a proven and familiar environment in which to develop applications software'. The Digital Research system supplied does indeed offer this, coming complete with a 68000 assembler, a C compiler, and several utilities.

The problem is that the QL will not run these without some additional memory. This rather important fact is not mentioned in any of Quest's advertisements to date.

The CP/M 68K operating system is implemented in conjunction with QDOS. This means that if a character needs to be printed on the screen, CP/M has to make the appropriate QDOS call. This switches out the CP/M ROM, and switches in QDOS which then prints the character on the screen. Control is then returned to CP/M which resumes running the program. Clearly with all of this the screen handling is rather slow, but not unusable.

The current CP/M 68K, version 1.01, is being reviewed for improvement to the disk drive response time and to amend a few bugs. Disk access is certainly slow compared to the IBM PC or the Apple, but not excessively so. These speed problems stem from attempting to cram a full CP/M 68K into the QL's available memory — the system runs a lot better with additional memory.

While at Quest, I witnessed the C compiler and an assembler working in

conjunction. The QL took some time to rearrange the files in a set of C programs which had been prepared and compiled on an IBM PC but the programs compiled and ran.

## Documentation

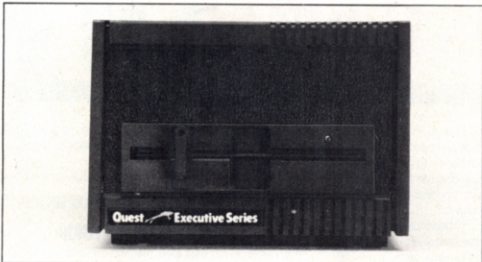
The manuals are generally well presented and avoid computer jargon. The first time user is taken through everything on a step by step basis. The disk drive manual has a good index, making it a good reference book. It lacks descriptions of the standard QL packages and how to use them with the RAM disk, and is also light on the general specifications of the system.

## Verdict

Overall, Quest has developed some useful additions that go a lot further towards realising the potential of the QL. The review system did need a little refinement here and there, but Quest says this will be fixed before long.

There is no way that the CP/M 68K can be used with Microdrives for any serious work. Without a memory expansion, the system is too small and slow.

With the addition of two 400K drives, the 128K RAM, and the expansion console, things begin to look a little more realistic. And having spent £1600 on a QL, monitor, and the above equipment, you will have a system that will run 68000 software at a decent speed, and also allow more efficient software production with the C and assembler packages. A price of £1600 is a lot for a machine that was originally produced as a cheap business/home computer. But to make the QL perform well, add-ons need to be added. ■



The Quest disk drives match the styling of the QL.

## SPECIFICATIONS

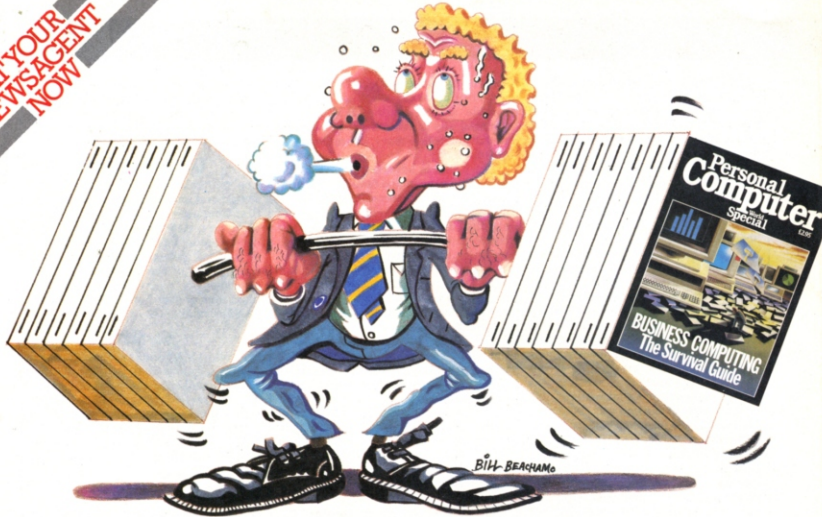
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## C64/SPECTRUM SHADOWFIRE



Beyond broke new ground with its land-scaping technique in the immensely successful *Lords of Midnight*. Now it takes another innovative step forward with *Shadowfire*, a graphics-only, non-arcade quest-cum-strategy game which it claims is the world's first ever icon-driven adventure.

*Shadowfire* is set in the future where spacecraft can travel between stars, but not planets. Plans for an inter-planetary ship, *Shadowfire*, have been developed, placed on micro-disk and, for some bizarre reason, embedded in the spine of one Ambassador Kryxix.

General Zoff, a traitor, desires universal domination. He has kidnapped Kryxix and stashed him on the skyfortress Zoff V. As mission controller of an organisation called Enigma, you must rescue the ambassador before time runs out.

Enigma is a sort of Magnifi-

cent Seven, although Super Six might be more appropriate. There's Manto, a transport droid, essential for getting the rest of your crew aboard Zoff V. Maul is a weapons robot, designed to be an efficient killing machine but without.

Sevrina, Maris and Torik are alien criminals skilled in marksmanship, lock-picking, weaponry and explosives. Completing the team are Zark Moontor, the human leader and unarmed combat expert, and Sylik, an insectoid.



Control of the game is managed entirely by the selection of icons (small graphic images) using a joystick, lightpen (Commodore 64 only) or keyboard. All you have to do is move a large cross-hair to the desired icon and press the fire button (or equivalent) to select it.

The screen is divided horizontally. At the top is mission command, split into three

areas. To the right is a picture of the character in play while a countdown clock and a cluster of six status icons, the colour of which indicates how the character is faring (eg inactive attacking, getting well, etc) is on the left. In the centre is the view screen, an iris (64) or blind (Spectrum), which opens to reveal where the character is and who else is nearby.

The lower section is used for three main displays — objects, movement and battle — which are called up on request. Each includes icons that allow you to jump back to the previous display (or cancel a command) and access the other displays.

The objects screen lets you equip a character. This shows weapons and equipment in the same location as the character, objects being carried (blank at the start) and a cluster of action icons. The cluster lets you pick up or drop an object, activate an object (eg arm a weapon system) and make an object ready for immediate use. Objects include rocket launchers, smoke bombs, toolkits, key cards, self-destruct units, transporters and assorted rifles. A bar indicates weight carried.

The movement screen shows a mixture of hollow and solid

directional arrows together with a text description of the location. A solid arrow indicates that movement in that direction is possible; selecting one will cause the character to move accordingly.

The battle screen contains similar directional arrows and permits the character to peek into an adjacent location, to attack, defend or retreat.

The graphics are generally excellent. My only criticism is of the small and differently coloured monitor icons which allow movement between screens. The optional, volume-controlled, music is first rate. Playing the game using the icon selection method couldn't be easier.

There's a great deal in this complex game and the countdown element enhances the challenge. Beyond promises a later program which will allow you to modify many of the elements in *Shadowfire*.

Although *Shadowfire* is not a game to get the adrenalin pumping, it does offer an absorbing mission. One thing's sure — you'll find it different from anything you've ever played before.

Bob Chappell

Price £9.95

Publisher Beyond 01-837 2899

## SPECTRUM

### FANTASTIC VOYAGE

Not only a neat little 'caverns' game, *Fantastic Voyage* might teach you more than deft finger-work.

The title's licensed from the film but — like others — borrows little more than a scenario. Which is not to say it isn't pretty good.

You've been micro-miniaturised and injected into the body of one Dr Ernest Hacker, and due to a foul-up with the redactor ray, your only hope is to get out. In your search for the eight scattered pieces of your submarine you'll have to reduce

infections, excise tumours and blast viruses. When the pieces are brought together in the brain, they shrink, and you can escape.

You start in the mouth, no exit right; those white pillars are teeth. So pick up part of the rocket that's on the tongue, and it's down the red channel of the throat. A parting of the ways next — trachea or gullet? But the way gutwards is blocked. To the lungs then, picking up a red corpuscle for energy and dodging warily past a flap of flesh that springs out regularly.

It's as you float about in the two-screen cavern of a lung that you get your first full appreciation of the animation. The

keyboard response is fast and the movement is smooth, but the collision detection can seem over-enthusiastic.

Lives left, temperature,



score, energy etc are shown at the top of the screen. Let your energy drop too low and you become invisible. To the right is a white torso on which a red square may appear, marking

an area under threat from infection. You must sort it out, for your life depends on your host's.

All locations are labelled and, while not spectacular, can be quite detailed. The lung walls have some unusual black and white texturing. Organs and hazards have been given a lot of thought and there are many surprises. Good to look at and fun to play, it's a game you'll come back to time and again.

Bryan Skinner



Rating 9/10

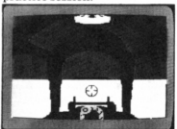
Price £6.95 Publisher Quicksilver 0202-891744

## COMMODORE 64

### SPITFIRE '40

If you can't afford the £250,000 or so it would cost you to buy a real Spitfire in flying condition, you might be tempted to look at this somewhat cheaper simulation from Mirrorsoft, whose original slogan of 'software for all the family' means the cockpit is likely to be rather crowded. I can't see would-be flyers clambering over each other to try it, though. It has some first-rate combat sequences but the actual flying controls are sluggish and jerky.

In fact, the only place where they're really hot is at the start, when the fire button allows you



Would that the real controls were so fine. The space bar which switches you between cockpit view and instrument panel is particularly poor —

several firm bashes are usually needed. When banking, the horizon-line jerks round in rather large lurches, and the landscape beneath your plane is very limited indeed. If you fly out over the sea, according to your cockpit view you're still over land. You're also allowed to fly beyond the edge of the map (of south-east England) but though you continue to fly, the map isn't updated.

Having listed the faults, there is still many good features in *Spitfire '40*. The cockpit instruments are beautifully done, and the software is well packaged. There are detailed instructions on landing and take-off procedures, and a great deal of background information

too. The combat practice section allows you to almost forget about the controls and concentrate instead on manoeuvring and shooting — watch out for the enemy in your rear-view mirror.

If you can get up in the air and deal with the enemy in real combat, your status can be saved to allow you to work up through the ranks.

But for all its virtues (including excellent sound effects) *Spitfire '40* looks better than it plays.

Mike Gerrard



Rating 7/10

Price £9.95 Publisher Mirrorsoft 01-353 0246

# GAMEPLAY

## SPECTRUM

### WIZARD'S LAIR

Bubble Bus's first piece of Spectrum software, which owes more than a little to *Sabre Wulf*, is another attempt at your actual arcade adventure; it spreads 250 screens over seven levels of the caves, rooms and passages making up the Wizard's Lair, into which poor Pothole Pete has stumbled. The only way to escape is by collect-

ing the four scattered pieces of the Golden Lion and negotiating the different levels which



are connected by Wardrobe Lifts and Magic Lifts.

There's the usual array of weaponry to help you, and an ever-diminishing supply of energy to go with each of your four lives. As well as bits of old lion, you can amass diamonds and rings out of sheer greed, and keys to help you open some of the doors.

As well as an array of goodies there's a naturally an even bigger array of baddies.

The graphics are well done, and play is fast and furious. Several joysticks are catered for

and you can define your own keys. Even without the complexity of *Sabre Wulf*, the game is much more accessible to the more humble player. If you've mastered the harder examples of this type, it would prove a disappointment, but otherwise it's thumbs up.

**Mike Gerrard**



**Rating 8/10**  
**Price £6.99**  
**Publisher Bubble**  
Bus Software  
0732-355962

## SPECTRUM

### MIGHTY MAGUS

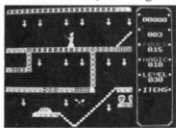
Imagine a cross between *Quo Vadis*, *Booby and Sorcery* and you've got *Mighty Magus*.

It's a platform game with adventure and mythology. As Magus, your quest takes you down thirty levels to a final encounter with Fraugy The Pierce in the Rising Sun Temple. The adventure ends when you return to the start.

Platforms are patterned squares, with the odd brick of a different colour, and beware a change of texture. Standing on some magic squares may throw you over, kill you or teleport you elsewhere in the great domain.

Ladders are staggered white diagonals, but you can jump through them by pressing the 'search' key. This is useful for checking piles of rubbish or chests for useful items such as shields or extra magic. Shields protect you as long as the screen

border stays yellow (not long enough). Occasionally you confront a monster, like a giant



spider. You can flee, fight or cast a spell (strengths 1 to 9).

Regrettably I haven't yet caught sight of the deadly dragon-like Fraugy. Bonus points to Quicksilver for its 30-name, saveable high score and monochrome option. The graphics aren't brilliant, and the theme isn't novel, but it's addictive and none too easy.

**Bryan Skinner**



**Rating 8/10**  
**Price £6.95 Publisher**  
Quicksilver 0202-891744

## SPECTRUM

### BODYWORKS

After his successful television programme and pop-up book, Jonathan Miller has now lent his name to computer software: *Bodyworks* from Genesis Productions. The package consists of seven programs on two cassettes, a colourful wallchart and an instruction booklet.

*Bodyworks* is for anyone who wants to learn more about how their body works, though it's more suitable for the classroom. It promises an exciting voyage of discovery around the human body, with stunning graphics, animation and games. One cassette covers cells, digestion, respiration and circulation; the other, nerves, muscles and a

marathon simulation.

The programs are surprisingly simple, and take little longer to go through than to load.

I started with the nerves program, designed to illustrate



how the nervous system controls and co-ordinates the body. There are no explanations — nowhere are you told what a nerve is or why we have them, so you're taken straight into the transmission of a nervous im-

pulse. Lay-people are likely to find the terminology and graphics difficult to follow. But the highlighting and the replay facilities do help you follow what's supposed to be going on. Reading the booklet helps; it contains more information than the software.

The graphics are hardly stunning, with their simple animated illustrations of complex mechanisms. The so-called 'games' are more boring than informative. In short, the software suffers from a lack of imagination.

The marathon simulation is designed to show how activity affects heart and breathing rates, body temperature, lactate production and so on. It's explained better in the booklet than any of the other programs,

but completely failed to capture my interest. And I was very surprised to discover that a male smoker aged between 56 and 65, who is also 30 per cent overweight, can sprint at 16 miles per hour for over a mile — I know I couldn't.

All in all I was very disappointed by *Bodyworks*. The graphics aren't good, nor is the software particularly informative. It might be useful for O-level or CSE revision, but I've seen much better. For £15 you could buy a comprehensive and illustrated book (or two).

**Clare Gurton**



**Rating 5/10**  
**Price £14.95 Publisher**  
Genesis  
Productions  
01-580 8436

## SPECTRUM

### CAR CURE

*Car Cure* sets out to provide an expert mechanic at your shoulder. It offers information about vehicle diagnostics and routine maintenance. There are no graphics — just menus and screens of text and its publisher Simtron claims to have crammed in 300 symptoms, 90 parts and 900 faults.

Once the program's loaded you get a menu — symptoms or problems. Menu movement and selection is two-keyed, eg shift and up/down arrow to move, and item selection by shift and right arrow. Single key operation would be less clumsy.

Once you've made your selection another menu appears, this time of different areas such as: running engine, starting engine, electrical system, brak-

ing and so on. Selecting one of these takes you to a further list, such as: fuel leak, coolant leak, fuel consumption too high etc.

Before any selection you can mark the menu item, which highlights it; later you can review the route you've taken — a clever and useful idea.

The bottom level in symptoms is a suggested remedy, eg check and adjust or replace as necessary, together with a difficulty rating and some comment like 'Garage — specialist equipment required', or 'A competent home mechanic can tackle this'. Of course, you may then have to refer to a workshop manual for procedures, and that will probably tell you as much, if not more than, the program. And if you are a competent mechanic, would you be using *Car Cure* in the first place?

There are some nice touches, but an equal number of nigglings.

The screen isn't just cleared, but 'curtains' are drawn across. This may look nice but it's slow. You can hold down keys for fast menu traverse — just as well, as the keyboard response is otherwise rather slow and often misses. Text is redrawn too frequently — more delay.



The most unusual facilities, and certainly the most useful, are Trace and Ok. Trace is an extension of Mark and is used when you think a certain part may be at fault and want to check the symptoms that it might cause. Ok is used to

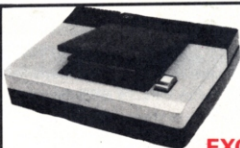
from menus when you've checked them out and know they're not needed. And you can save and load fault diagnoses.

The main failing of programs like this is that a book can provide far more detail and you can literally have it to hand while you're at work. A vehicle's workshop manual describes how parts of a car work, how to dismantle, check and replace them and there are many fault-finders on sale. *Car Cure* just gives you a rough idea of what may be wrong, and requires a lot of prior knowledge — you've got to have a fair idea of what's wrong before you start. However, of its type it's the best I've yet seen.

**Bryan Skinner**



**Rating 7/10**  
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# AMSTRAD

Most of the releases this week are conversions of games on other machines. *Zapp*, however, is an original, single-pass assembler. It comes with an editor, monitor, symbolic disassembler, hex editor and file manager. It compares well with Kuma's *Zen* and Arnor's *ADE*

and is cheaper, so if you're just getting into machine code it's worth a look.

*Combat Lynx* is a faithful conversion of the 64 and Spectrum games, and Durell has added a really neat rotating wire-frame chopper to the weapons selection screens.

Combat Lynx	£8.95	Durell 0823-54489
Death Pit	£6.95	Durell 0823-54489
Millionaire	£6.95	Incentive 0734-591678
Super Pipeline II	£8.90	Tasket 0262-673798
Zapp	£14.95	Hewson 0235-832939

## COMMODORE 64

*Gates Of Dawn* looks very nice indeed. The graphics aren't particularly detailed, but the imagination that's gone into them is striking. It's an arcade adventure and Virgin claims that it only leaves 14 bytes free. We'll review it in full soon.

*Gribbly's Day Out* is an amusing and tricky little number. Gribbly is a cleverly animated

frog, and while the rest of the graphics aren't brilliant, it's worth a second look.

**Elidon** won't be released till May 1, but Orpheus reckons to have been working on for five months, so it should be good. You guide a faerie through several hundred highly detailed screens to find the seven magical flowers of Finvarra

Gates Of Dawn	£8.95	Virgin Games 01-727 8070
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Stringer	£9.95	Addictive Games Chacom 418297
Mooncresta	£6.95	Incentive Software 0734-591678

## SPECTRUM

*Ashkeron* sounds almost too good to be true — a 100 per cent machine code, real-time adventure featuring 'the unique walk-through graphics system'. Whichever way you turn, the perspective alters. Your task is to recover five stolen treasures from the wizard's castle.

*Key of Hope* is part two of *Tower of Despair*. There are

over 400 locations and the atmosphere is enhanced by the manuscript text and graphic illustrations. Summoned by the White Goddess, you (the Warrior-Mage of Castle Argent) must recover the fragments of the key of hope, the last defence against the shadow of Malnor. Games Workshop is really becoming a vital force in graphics adventures.

Ashkeron	£5.95	Mirrorsoft 01-822 3947
Arnhem	£8.95	CCS 01-858 0763
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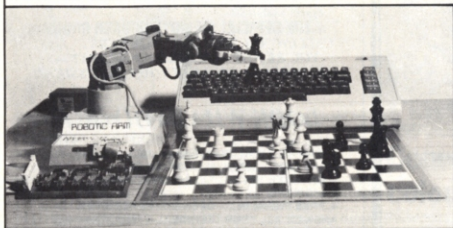
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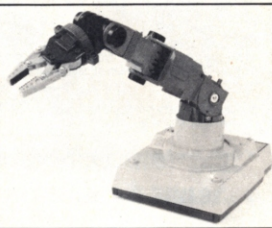


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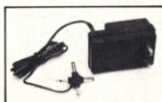
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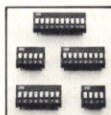
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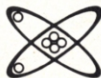
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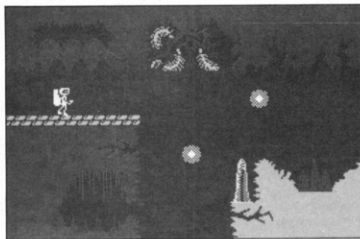
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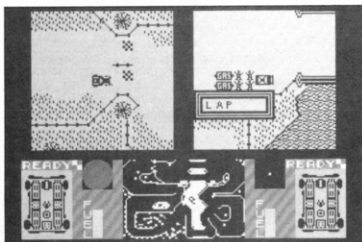
Here's part two of our great competition that could make you the owner of a Spectrum Plus with Interface 1 and Microdrive. In conjunction with Sinclair, we're giving away two complete systems with ten runners-up prizes of top software titles.

We gave you three screen photographs last week; here are the remaining three. All you have to do is identify all six games from the eight titles given below. Complete the entry form and send it to Spectrum Competition, *Personal Computer News*, 62 Oxford Street, London W1A 2HG before Friday, May 3.

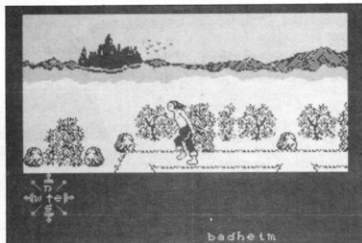
1 Monty Mole 2 Battle Cars 3 Tir Na Nog 4 Sorcery  
5 Backpacker's Guide 6 Valhalla 7 Pyjamarama  
8 Strangeloop



F



D



E

### Entry Form

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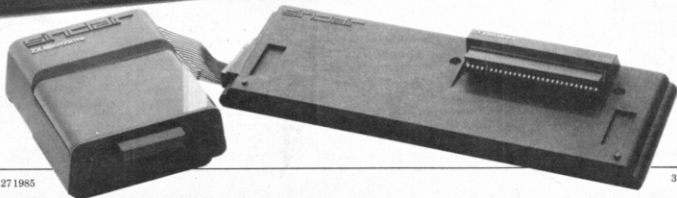
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The editor's decision is final. No correspondence will be entered into. The competition is not open to employees of Sinclair Research, VNU Business Publications, Quickset, or Chase Web Offset.



# PSIZABLE DATABASE

Simon Williams introduces a database, written for the BBC B and suitable for hobbyists, which proves that Basic isn't as slow as it is often made out to be.

A computerised database can be a boon, for anybody running a club or keeping a collection of, for example, albums. Card indexes are all very well, but alterations look tatty, and sorting them can be a hefty task.

One of the latest databases on the market for the BBC Micro (and Electron) is *Psi File*, written by HaiKu Software Technology, and published by Sigma Technical Press. Anyone familiar with the HaiKu Japanese verse form might expect something short and esoteric. But *Psi File* takes quite a bit of room, needing just under 12K for data storage.

## Presentation

The package consists of a cassette or disk (the review copy was on cassette), and a 32 page manual, all packaged in a video-style case.

The manual is well written, as you might expect from a company which specialises in computer books. Nonetheless, it is sketchy in places, particularly when discussing the use of key fields, an important part of the database.

The program itself is pretty well structured, and if you have any knowledge of databases in general you will probably be able to find your way around *Psi File* without much reference to the manual.

## In use

*Psi File* uses the Beeb's teletext Mode 7 (40 × 25) for display. This is mainly because of its economical use of memory (1,000 bytes), but it does also allow all eight colours to be used.

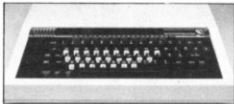
When you first load the program you are presented with an eight option menu and status information on the database currently in memory. This includes the number of records created; the available memory remaining; the estimated number of records you can squeeze into it, and a space for any messages from the program.

The eight menu options are fairly standard for programs of this type (see table).

When creating a file you must specify the field name and type of each field, and whether you want it to be a key field: *Psi File* is hot on field types. This ensures that the data in your file is stored

efficiently, but doesn't make the package as friendly as it might be. There are six data types: integer, long integer, real, character, string and block string. Each field type must be specified before you can enter data into it.

Once you have declared the name and type of your field, you must decide whether you want it to be a key field or not. *Psi File* allows up to 30 key fields, and since most databases will not have that many fields in total, this is generous. When you later come to sort and search your file, you will find it much quicker to use key fields than non-key ones — so you might as well declare them all.



## Menu options

- 1 Create
- 2 Enter
- 3 Maintain
- 4 Access
- 5 Print
- 6 Load
- 7 Save
- 8 Quit

When you've finished setting up all your fields, you can start entering data into them. As you go through each field, you are prompted with the field name and type, and the length of the field is marked with white squares which are overwritten as you type in your data.

You can delete characters from your entry and the white squares refill the empty spaces.

You can edit and delete individual records, and you can also sort them using *Psi File*'s bubble sort routine. This sort is one of the slowest sort algorithms around but has the virtue of being short on code.

Searching can be performed on any number of fields, either as a key search, in which the program assumes it is looking for a unique record, or a non-key search. A non-key search will present each record which matches a given

criterion. The criteria can be quite complex and on the disk version may involve comparators such as '<' and '>' as well as '='.

All versions allow wild cards and instring searches. You can use the '?' wild card to replace any single character and the '+' sign to replace the end of a word. Thus, for example, 'Fo+' will match 'For', 'Fothergill', 'Football' and 'Fool'. The instring search uses the '\$' symbol and will match a given set of characters if found anywhere in the strings being searched.

You can print your file from any point within it to any other, or by using the search facilities just described. Limited formatting of text is available, to allow for the printing of address labels, for instance.

Saving and loading files is straightforward, although the prompt 'Cmd/File' is less than helpful.

## Verdict

A typical application with ten to 15 fields of average length can have between 120 and 150 records. This is enough for many jobs, although probably only for the hobbyist.

The screens are well laid out, with good use of colour to distinguish the different parts of the display. The program is in Basic, although its protection is good and may hide machine code routines for searches and sorts. It's surprising how much guff is spoken about the unsuitability of Basic for serious applications. Compared with some of the CP/M-based commercial software I've seen, coded in C or straight machine code, *Psi File* is commendably quick. Even though the program is RAM-based, and likely to be language rather than disk bound, you'll never have to wait more than a few seconds for the file to be searched.

It may be unfair to compare a RAM-based program with a random access database, which can handle much bigger files, but with RAM costs dropping all the time, a lot more applications software uses core memory for full scale data storage.

*Psi File* is well up to scratch as a small-scale home database, although it might have been nice to have more emphasis on the use of the product than on the clever techniques employed in programming it. ■

## REPORT CARD: 1 TO 5

Features	●●●●
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Performance	●●●●
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You'd think after publicity-seeking politicians had finished victimising innocent Scotland supporters, football hooliganism would be pretty well played-out in public relations terms. But not a bit of it. Shy and retiring Sperry, mainframe computing's answer to shy and retired Jimmy Gries, has teamed up with Systemsolve, a 'long-established UK computer services company' (computing's answer to Eddie Waring?), to produce an identity card service for fans.

The idea is that fans register with their clubs and pay an annual fee for the card. This is then passed through a card reader at the turnstile. You'd think this then contacts Sperry's mainframe to check to see if you've been involved in any GBH-related incidents. You'd be wrong though, because all that happens is the club sends a regular list of the bad boys to Systemsolve, and Systemsolve sends a blacklist back to the clubs.

At this point you might well find yourself asking some pointed questions. The blacklist that comes back will be sent to the home team, and will

include details of the visiting team's troublemakers... but most of the gubbins still looks like being on paper.

On the subject of GBH, poor old Sir Clive has copped it from the Advertising Standards Authority again. The complaint referred to a QL advertisement that said 'you can load a 90K program in just six seconds'. The complainant pointed out that the Pison software takes 60 seconds to load, and that his own programs took 90 seconds for 20-40K.



Apple splashes out in a big way.

The complaint was upheld, but the ASA noted that Sinclair had, before the complaint was notified, changed the wording to read 'you can load a 90K program in seconds'. It doesn't really have the same ring to it...

Meanwhile we have exclusive news of the Inter-Galactic Robot company, subtitled 'The Droids' but no relation to the Sirius Cybernetics Corporation. IGR is the front company for well-known computer specialist Robin Bradbeer, who reveals that the company is currently working on a robot lawnmower. When you've finished falling about laughing it might occur to you that it's not such a daft idea after all. The idea of squat little R2D2s running round the grounds of Woburn Abbey whistling *In an English Country Garden* is a little bizarre, however.

Over in Germany they do things differently, of course. British computer shows usually have a fair quota of pallid, lank haired hackers in anoraks, but the Hannover fair indicated that the German version is a big strapping lad — no question of brushing him away from in

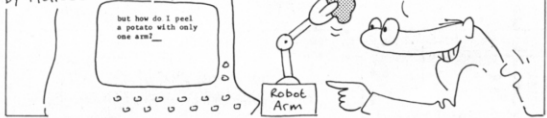


Some people will do anything...

front of a Commodore 128. Apple Germany is currently trying to build on the German computer user's undoubted physical advantages with various little items along the lines of those illustrated here. The Badetuch (bath towel) in 100 per cent Baumwolle might be a goer, but we doubt if there's much market for 'die Sporttasche Wimbledon aus Crinole Canvas'. Not if you have to prance around like that with it, anyway...

## PAL2000

by Mollusc



## SYNTAX ERRORS

The BBC scroll routine in issue 106 Microwaves rolled up in the newsgroups with an error in it. Line 1051 should have read: 1051 ?&350 = \$%\*8?&351 = (\$%\*8) DIV 256

What a shame, just when we thought we had finally achieved a perfect issue. Better luck next time.

## PCN DATELINES

Event	Dates	Venue	Organisers
TI99/4a Exchange (UK TI User Group)	April 28	Royal Pavilion, Brighton	Clive Scally, 0273-503968 after 7.30pm
Computer Aided Production Management Exhibition	April 30-May 2	Wembley Conference Centre	David Houchin, 01-579 9411
COMDEX Spring	May 6-9	Atlanta, USA	Interface Group, 300 First Avenue, Needham MA 02194, USA
Apple 85	May 9-11	Novatel Complex, Hammersmith, London	Pamela Goodwin, 061-480 7863
Electron and BBC Micro User Show	May 9-12	New Horticultural Hall, London	Database Publications, 061-456 8383
Micro City 85	May 14-16	Bristol Exhibition Complex	Argus Specialist Exhbn 04427-73291
Hong Kong Comp Conf & Exhbn	May 21-24	Hong Kong	Trend Exhbn, 1203 Wah Kwong Building, 60 Hennessy Road, Hong Kong
DEXPO South	May 26-29	New Orleans, USA	Reed Exhbn 01-643 8040
Compec Europe	May 7-9	Brussels	CGP 01-528 9256
Nat Software & Comp Exhbn	May 29-31	Brisbane, Australia	Riddell Exhbn Promotions, Riddell House, 137/141 Burnley Street, Richmond, Victoria 3121, Australia
Business Computer Show	June 4-6	Earls Court, London	Reed Exhbn 01-643 8040
Computer Peripherals & Equipment Trade Exhbn (COMPETA)	June 4-6	Kensington Exhbn Centre, London	Network Events 0280-815226

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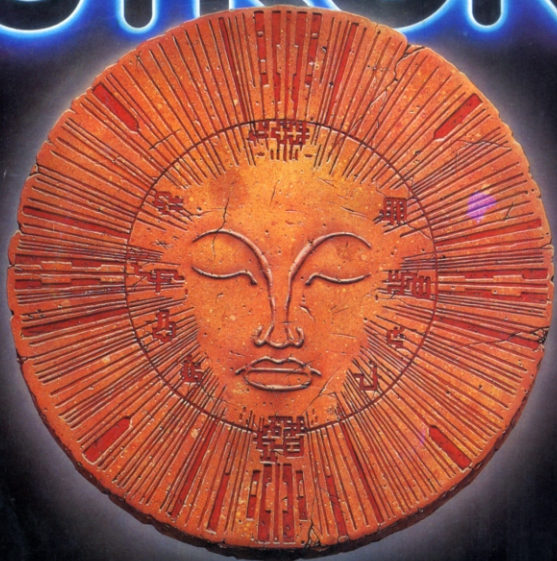
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