40 Rock RD L

POPULAR Computing WEEKLY

Only 50p.

3-9 July 1986

Vol 5 No 27

Commodore to clash with Atari

● Souped-up 68000 machines due from Atari and Commodore this Autumn
● Both machines will have massively increased memory and processing power
● Sound and graphics industries targetted by Commodore

Full details below and inside

COMMODORE and Atari are set for a head-to-head confrontation this Autumn as both companies plan souped-up versions of their 68000 processor machines.

Prototype versions of Commodore's Amiga 2, which features a full 68020 processor and improved blitter and sound, are already thought to be in circulation in the United States, with an announcement of the machine predicted for September, while Atari is also working on a 68020 machine with a built-in blitter chip.

In Atari's case the new machine will move in at the top of the range, leaving cheaper versions of the ST to sell into mass markets while the more powerful model is used for specialised graphic and sound tasks. Commodore's current version of the Amiga is however too expensive for this to be an option, and the Amiga 2 is

Continued on page 4 ▶

AMSTRAD 464/664/6128, ATARI 64K, BBC 32K, CBM 64, MSX 64K, SPECTRUM 48/128K

Red Moon

Voted
"BEST ADVENTURE OF THE YEAR"
Commodore Computing International
Amstrad Computer User
Computer and Video Games

Voted
"BEST GRAPHICAL ADVENTURE 1985"
Zzap! 64
Amtix
Crash

£6.95
Cassette

The Price of Magik

NOW AVAILABLE

Rise from Sorcerer's Apprentice to Supreme Wizard

Many Powerful Spells

Independent Creatures

200 + locations, all illustrated
(not BBC)

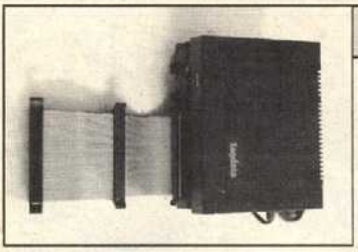
Sophisticated word-recognition and fast response.

NEW

£9.95
Cassette

Send a large S.A.E. for FREE POSTER and mail order details to:
Level 9 Computing, P O Box 39, Weston Super Mare, Avon, BS24 9UR

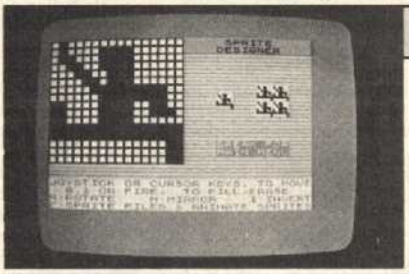
Contents



◀HARDWARE

13 Special forces
Communications is a continuing growth area for computer owners and while it sometimes seems that the Amstrads, Commodores and BBCs get all the goodies, there's something new for Spectrum owners. John Lettice plugs in the Spectre comms pack and files his report

Some of our features are missing
Apologies to those of you looking for the Amstrad supplement this week. Unfortunately, it was a casualty of technical difficulties and, all things being equal, will appear next week



◀SOFTWARE

14 DIY games
Games creators are nothing new, but while many have taken the pain out of programming, they've also taken the quality out of the games. John Minson looks at the latest of the kind, from Argus Software

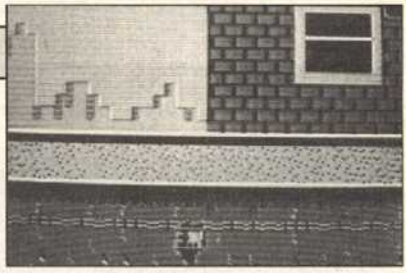
14 ST utility
If you're struggling to get to grips with machine-code programming on your ST, Microdeal has something that might help. Duncan Evans checks out the *Kissed* (??!!) debugger

GAMES▶

16 Reviews
In full colour this week, the long-awaited *Knight Games* on the Commodore 64, and Mirrorsoft's *Action Reflex* for the Spectrum. Plus *Murder on the Mississippi*, *Speed King* and *Floyd the Droid*

19 Arcade Action

20 Adventure Corner



◀PROGRAMMING

22 Languages
Continuing our series on computer languages, John Mawhood examines the benefits of Prolog, best known for its use in artificial intelligence research

24 Commodore 64

25 QL

26 Amstrad

28 Atari ST

30 Peek and Poke

31 Bytes & Pieces

32 Spectrum

REGULARS▶

4 News Desk

8 Letters

10 Puzzle

34 Communications

37 Soundcheck
Mark Jenkins weekly look at the world of computer music

44 New releases

46 Charts, Hackers

Editor Christina Erskine **News editor** John Lettice **Features editor** John Cook **Production editor** Michelle Beauchamp **Supplements editor** Christopher Jenkins **Supplements designer** Barbora Hajek **Advertisement and Promotions manager** Simon Langston **Assistant advertisement manager** David Osen, **Advertisement executive** Jon Beales **Classified executive** Rodney Woodley **Editorial secretary** Annmarie O'Dwyer **Administration** Geraldine Smyth **Managing editor** Peter Worlock **Publishing director** Jenny Ireland.
Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 **Typeset by** Publishers Reprographics Services Ltd, 4 Roger Street, London WC1, **Printed by** McCorquodale, Andover, Hampshire. **Distributed by** S M Distribution, London SW9, Tel 01-274 8611, Telex 261643.
© Sunshine Publications Ltd 1986.

Popular Computing Weekly. Tel: 01-437 4343.

ABC

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

QL pressure group formed

QL RESCUE plans received a shot in the arm last week after an information seminar organised by the magazine *QL World* at the instigation of Colin Hughes of Transform. The seminar was attended by representatives of companies from France, Italy, Denmark, the United States, Holland and the UK, and Hughes was voted chairman of a new pressure group to market the QL.

"It'll be called the Independent QL Suppliers' Group or something," says Hughes, but he intends to issue a press statement outlining the group's plans by the end of this week.

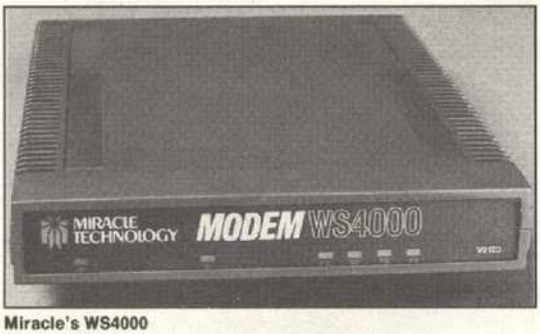
In the short term the group will attempt to maintain interest in the machine, possibly in conjunction with CST's Thor upgrade, but in the longer term if the machine is to survive it will be necessary for someone to buy the rights to it from Amstrad. The CST Thor is now being marketed by Eidersoft, and according to an Eidersoft spokesman the machine is now to be marketed as "the ultimate QL add-on". It appears that any plans to restart production of QL circuit boards, and to base the machine on these, have been abandoned.

There are however, abundant supplies of QLs at the moment, and although export distributor PST's deal with Amstrad means it can only sell its 20,000 outside the UK other companies have sufficient stocks in both component and assembled form.

CST hopes to sell 5-10,000 Thors, but the fact that the machine has a 3½ inch disc drive and no Microdrive is concerning some software houses. Veronica Cullen, who attended the seminar for Talent, was doubtful over the economics of software houses going over to disc for this sort of volume, and similar volumes for later machines wouldn't help much either. "It's going to be expensive to support the QL compatibles," she said, and although Talent intends to continue to produce QL titles for some time yet producing them in both disc and Microdrive format would be difficult.

It's not yet certain whether or not a buyer will be found for the rights to the QL in the longer term, or indeed whether Amstrad will be willing to sell the machine, but of the possible buyers it would seem that Thorn EMI a long-standing Sinclair component manufacturer, is currently the front runner. .

The QL: Abundant supplies for upgrade



Miracle's WS4000

New Miracle modem

MIRACLE TECHNOLOGY is set to launch an auto-dial, auto-answer, Hayes compatible modem for £176.40 including VAT. The new WS4000's standard version supports V21 and V23 standards, and offers speeds of 300, 600, 1200, 1200/75 and 75/1200 baud.

It can also be upgraded to include V22 1200 Baud full duplex and 2400 baud full duplex, and has options of DTMF tone dialing, battery-backed internal telephone directory, process control port and approved Bell standards to be used for transatlantic communications purposes.

Details from Miracle Technology, St Pteters Street, Ipswich IP1 1XB (0473 216141).

Cheetah Amdrom now on sale

CHEETAH intends to start shipment of its £34.95 Amdrum digital drum machine for the Amstrad this week, and expects them to appear in the shops by next week. Latin and Electro kits with kit editors should also be available for the Amdrum at that time.

Details from Cheetah Marketing, 1 Willowbrook Science Park, Crickhowell Road, St Mellons, Cardiff (0222 777337).

Commodore to clash with Atari

◀ Continued from page 1

liable to supplant it.

Atari is thought to be scheduling its new machine for a September launch, and to differentiate it from the current top of the range 1040ST it is likely to have at least two megabytes of memory. The company is also likely to take advantage of the extra memory and the blitter to try to widen the ST's appeal into more specialised fields.

This is the route Commodore intends to take with its current Amiga in the UK. The company has recently appointed eight new dealers who specialise in graphic design rather than in computers, the idea being that these dealers will be able to sell the machine as part of a graphics solution rather than as a computer.

"The graphics industry is an ideal area for fully utilising the Amiga's abilities", said Commodore acting general manager Chris Kaday. "This represents the first of many vertical market areas into which we will be launching the Amiga".

Commodore's hit list of these areas consists of graphics, business, desktop publishing, education and music, and it hopes to develop a small but lucrative market in each of them. But the advent of a more powerful blitter-based Atari machine latter in the year is likely to mean Commodore will need the support of the Amiga 2 to succeed.

In the United States Atari would seem to be winning the 68000 war. Initial reports after the launch of the Amiga and the ST were that the Amiga was holding its own, and possibly doing better, despite a higher price. Atari however now claims worldwide sales of 200,000 STs, and predicts 500,000 by the end of the year. This is a tough target to achieve, but the company now seems to have sorted out its US distribution, and is managing to get the ST into the major chain stores.

Enterprise is beamed down

ENTERPRISE Computers has gone into receivership just shy of three years into its lifespan. The company announced its micro, first called the Elan, and subsequently the Flan then the Enterprise due to legal problems, on September 14 1983, but September 14 1984 had come and gone before the high specification micro finally came out of the traps. The Z80-based machine had looked attractive when first announced, but although its launch specification exceeded that of competing micros such as the Spectrum and the Oric it arrived too late to reap the benefit of the home micro boom, and like the Memotech (recently dead, buried and resurrected itself) it existed on low sales and a small but determined band of enthusiasts.

A spokesman for receiver Grant Thornton wasn't able to comment on whether or not there would be an attempt to rescue the company, but given the current financial climate in the micro industry the chances of this happening look bleak.

Debts run into six figures.

Enterprise: Boldly gone . . .

Robtek launches 50 game King Size

ROBTEK is to launch a new "King Size" range of budget tapes which will consist of 50 games for £9.95 over a variety of formats. The company hoped to launch the Commodore 64 version this week, with C16/Plus 4, MSX, Atari, Spectrum and Amstrad versions following through July.

Budget utilities, including a turbo loader for the C16/Plus 4 at £4.95, are also planned for release shortly.

Details from Robtek, Unit 4, Isleworth Business Complex, St Johns road, Isleworth, Middx TW7 6NI (01 847 4457).

Domark's new signing is trivial

DOMARK, which was recently forced to redesign its 'unauthorised' *Splitting Images* game, appears to have learned the error if its ways and has bought the rights to produce the computer version of *Trivial Pursuits*. The company intends to launch the game for the Spectrum, 64, Amstrad and BBC at the PCW show in September, and claims advance orders of over 40,000 units – enough to produce a hit game.

It is intended that the game will feature many of the standard questions, but will also have additional questions designed to take advantage of sound and graphics. It will cost £14.95.

Mark Strachan and Dominic Wheatley check their new game for signs of life.

Gold bows to telex pressure

TELECOM Gold is to drop its 50p charge for receipt of incoming telexes today (Thursday). The charge has been levied since the electronic mail service began its telex service two years ago, and has caused a considerable number of complaints from subscribers, particularly those who found that some of their telex traffic turned out to be junk mail.

Phone trouble for Software Discounts

MAIL ORDER software discount house Software Discounts appears to have had its phone disconnected. *Popular Computing Weekly* would welcome information from anyone knowing the company's new phone number, and/or its current status.

SID meeting

THE CREDITOR'S meeting for Software International Distribution, which went into liquidation recently, is to be held in London on 17 July.

Any readers owed software from the company's discount software offer should write to *Popular Computing Weekly* giving their details as soon as possible.

Coming soon: a PC glut?

THE LAUNCH of Spectrum's IBM compatible machine, manufactured by Bondwell, (see last week's issue) seems to have triggered a price war between Spectrum and the machine's main UK distributor, Barbatan.

On hearing of Spectrum's pricing Barbatan dropped the prices of its own Bondwell machines, making Spectrum's "Amstrad cruncher" look a lot less revolutionary. The price level for the basic 640K machine is £690, which – excluding very small production run machines and 'one-offs' is a new low for the UK.

Trade prices of £250 for IBM compatibles are however becoming more and more a reality here.

This is unlikely to please Alan Sugar, who has traditionally attacked 'soft' markets with is products. The PCW series, for example, is based on tried and tested Z80 technology, using the CP/M operating system. Small manufacturers had actually been doing this for some time, with £250-£400 5¼ inch drive CP/M machines having been on the market for some time prior to the advent of the PCWs.

But Amstrad scored with the marketing of the PCW. It was available in quantity through easily accessible dealerships and sold into new markets as a word-processor/typewriter. Because it was relatively hassle-free, and was perceived as good value, it sold.

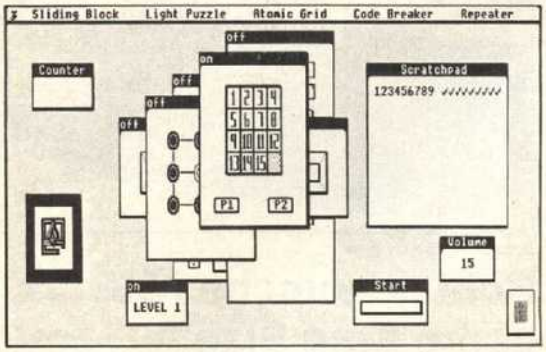
Now Amstrad probably intends to do this with his PC. In order to sell it must be perceived as being something that is exceptionally good value. But there's the rub.

With the PCW Amstrad didn't have any serious competition, as most of the manufacturers of CP/M machines had already moved over to the IBM/MSDOS standard. This time round they're still with IBM, and will be forced either to withdraw from the low-end PC market, as Apricot has, or cut prices.

Even if it's simply a case of their having nowhere else to go at the moment, many of them will think in terms of price cuts.

If Sugar has a new angle to his PC that will make it difficult from the price-cutting opposition it will succeed. But if not he has a fight on his hands.

Product News



Compumart cuts prices for discs

MAIL ORDER company Compumart has cut the price of its blank discs. Amsoft 3 inch discs are down from £40 a box of ten to £32, while 3½ inch discs £19 for single sided and £24 for double.

The company's 5¼ inch discs are now £9.95 for a plastic box of ten, with two free discs being given free with every ten purchased. All orders are subject to a £1 charge for postage and packing.

Details from Compumart, Unit 8, Falcon Street, Loughborough, Leics LE11 1EH (0509 262259/233893).

A mice pair

ZAP ZONE and MIND GAMES are two new BBC packages designed to be used with the AMX Mouse. *Zap Zone* comes on tape and is a mouse powered arcade game, while *Mind Games* is a collection of five intelligence testing games. It costs £14.95 on disc, while *Zap Zone* is £4.95.

Details from Advanced Memory Systems, 166-170 Wilderspool Causeway, Warrington WA4 6QA (0925 413501/2/3)

C compiler for BBC 68000

DELCOMM'S DMS 68000 second processor for the BBC micro and Master series is now available with a C compiler at no extra cost. The DMS 68000 currently comes with 128K Ram, and can be expanded to 15 megabytes. A 256K expansion board is currently under development.

The current system includes the board, two Eproms containing linking software and a cross assembler, user manual, assembler manual and a guide to 68000 assembly language. System software includes assembler, monitor and the C compiler, the complete package costing £351.76.

Details from Delcomm Microcomputer Systems, 46 Nasmyth Road, Southfield Industrial estate, Glenrothes, Fife (0592 775022).

The last word on home WP

WORD PROCESSING is a user group and by-monthly magazine designed for users of home word processors. It currently concentrates on Amstrad machines, with some coverage of the BBC micro, but plans to expand to further micros, and to other serious software, eg databases and spreadsheets, in future issues.

The group's aim is to produce easy to understand information for the new user. It has also managed to secure discounts, including £20 off NewWord, for members. Membership (including the magazine) is £6 a year.

Details from Word Processing, PO Box 67, Wolverhampton, West Midlands.

Hantarex launches mono monitor

THE HANTAREX HX12 is a high resolution 12 inch monochrome monitor featuring 80 column display, 18Mhz band width and audio input. It costs £79.50. Details from Hantarex, Unit 2, Lower Sydenham Trading Estate, Kangley Bridge Road, London SE26 5BA (01 778 1414).

Diary Dates

JULY

16-18 July
PC User Show
Olympia, London
Details: Hardware and software for IBM machines and their compatibles.
Organiser: EMAP, 01-608 1161.

24-27 July
Acorn User Exhibition
Barbican Centre, London
Details: Hardware, software and peripherals for the Electron, BBC micro and Master machines.
Trade only 10am-1pm on 24 July.
Price: £3 adults, £2 children, £1 discount for advance sales.
Organiser: Editionscheme, 01-349 4667.

SEPTEMBER

3-7 September
Personal Computer World Show
Olympia, London
Details: Software and hardware for home, educational and business computer users. For the first time this year the show is to be organised in three separate halls – business, games and education.
Price: £2.
Organiser: Montbuild, 01-487 5831.

8th September
Official Commodore Computer Show
UMIST, Manchester
Details: A wide range of Commodore hardware, software and peripherals. Formerly the Commodore Horizons show.
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Publications, 061-456 8383.

26-28 September
Electron and BBC Micro User Show
UMIST, Manchester
Details: Software, hardware and peripherals for the Electron, BBC micro and Master machines. Produced by Acorn.
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Publications, 061-456 8383.

OCTOBER

3-5 October
The Amstrad Computer Show
Novotel, London
Details: Home and business software and hardware for the Amstrad range of computers.
Price: £3 adults, £2 children, £1 discount for advanced booking.
Organiser: Database Publications, 061 456 8383.

30-31 October
Hampshire Computer Fair
Guildhall, Southampton
Details: Business computers and communications.
Price: Free entry by business registration.
Organiser: Testwood Exhibitions, 0703 31557.

NOVEMBER

22 November
The 6809 Christmas Show
Royal Horticultural Hall, Westminster, London
Details: Dragon software and peripherials.

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

THE IMAGE SYSTEM

This is THE IMAGE SYSTEM: a computer graphics package with a difference!

In addition to providing the usual drawing and painting facilities THE IMAGE SYSTEM allows you to zoom, move, copy, scale, rotate and even twist and fold your pictures in 3D SPACE.

With facilities like these you can produce an almost infinite variety of effects from the simplest of images. Gone are the days of spending hours to create a single picture. THE IMAGE SYSTEM sets you free to experiment and use your imagination.

--And there's more; using features like transparency and colour filtration you can modify and combine your images using the full range of colours available on the AMSTRAD.

The pictures you produce can be controlled from Basic adding graphic flair to your program. THE IMAGE SYSTEM even COMPRESSES pictures saving valuable memory space.

You will find an explanation of all the features mentioned, and more in the comprehensive manual which accompanies the program including a fully illustrated step by step exercise to take you through the all important first half hour of using this program.

AMSTRAD
CASSETTE £19.95
DISC £24.95

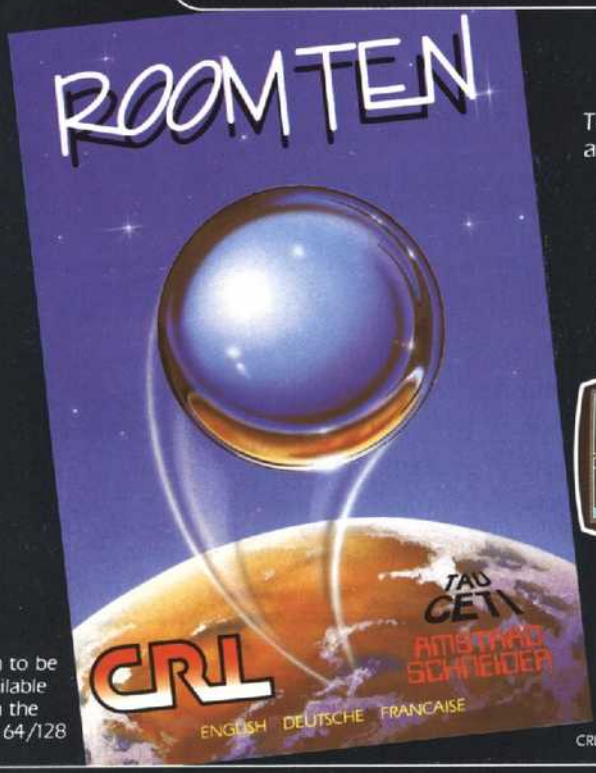
HOT LINE: 01-533 2918

THE IMAGE SYSTEM
LET YOUR CREATIVITY FLOW

CRL

CRL Group PLC, CRL House
9 Kings Yard, Carpenters Road
London E15 2HD

TWO MORE GREATS FROM CRL



Soon to be available on the CBM 64/128

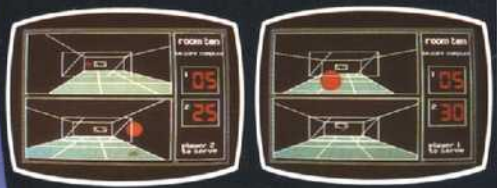
ROOM TEN

The stunning game of the future by the author of the legendary TAU CETI.

GAME OF THE MONTH C+VG

Room Ten is simple Addictive fun with a capital F. Well put together with neat graphics, terrific Sound and totally absorbing Game play.
"COMPUTER AND VIDEO GAMES"

A crisp combination of simple but effective ideas add up to an addictive and challenging game.
"SEAN MASTERSON (AMTIX)"



ACTUAL SCREEN SHOTS

£7.95
CASSETTE

Hot Line: 01-533 2918

CRL

CRL Group PLC, CRL House 9 Kings Yard, Carpenters Road London E15 2HD

Letters

Citizen patriot

I'm writing this letter as I was surprised that the Citzen 120D printer was not listed in the supplement (*Popular Computing Weekly, June 19*).

I've had my Citizen for more than a month and I've continually used it without fault with my QL. It is compatible with Epsons and an IBM Graphics printer through its Centronics or the optional RS232 interface. The interfaces are on cartridges which means that changing from a parallel to a serial printer takes only a few seconds and not a costly business in sending it back to the factory. it prints at the speed of 120 CPS in draft mode and 25 CPS in NLQ.

NLQ, italic, emphasized, condensed and pica can be selected through the front panel by pressing a combination of the On Line, LF and FF buttons. A fully comprehensive manual comes with the printer which is a credit to Citizen.

It works well with *Quill* although I did have difficulty printing in NLQ at first. The problem was that *Quill* was programmed to send the code, *Chr$(27); @*, to initialise the printer to the present DIL switches before sending the letter. Therefore the only way to print in NLQ was to set the option in the DIL switches, which was impractical.

The solution was to load the install bas program as described in the information section of the User Guide. You then select the option to edit the Epson code and delete the *Esc@* from the preamble code.

In my opinion the Citizen 120D is better than most of the printers listed in the supplement, better even than the Epson FX-80 and RX80, Seikosha 700A, 100, and 250X, Brother HR15 and HR-5 and perhaps even better than the Centronics GLP.

The Citizen 120D printer sells at the reasonable price of £160 from some shops which is much lower than its competitors.

Rhys Miles
Little Quarry
Heol Las
Energlyn
Caerphilly

Brain storm

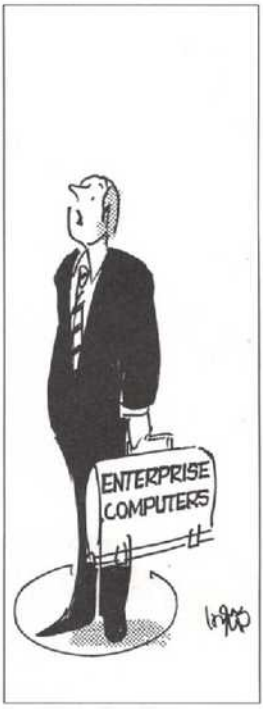
I have recently purchased a second hand New Brain AD computer as manufactured by Grundy Business Systems, who I believe ceased trading, but I understand that the New Brain was rescued.

Would it be possible for you to send me a list of any back issues of Popular Computing Weekly which feature articles or listings for this computer together with the name and address of the company that rescued the New brain if they are still trading, also any additional information, names of publications etc. that may be of help to me.

Also if any of your readers could help me with listings, software or secondhand hardware for this computer I would be most grateful.

A J R Yates
68 Lansdowne Crescent
Carlisle
CA3 9EP

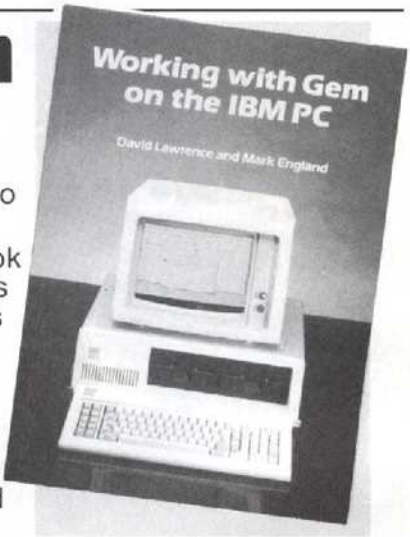
I'm afraid we never covered the New Brain in much depth Mr Yates – perhaps one of our readers could help?



Scotty! . . . Scotty?

The jewel in the crown

- Working with GEM on the IBM PC is the indispensable book for anyone who wants to understand and make the most of the GEM operating system that has brought the IBM PC into the era of windows, icons and mice.
- Fully illustrated in the way that only a GEM book could be, working with GEM on the IBM PC ranges from the simple techniques to exploit fully GEM's Desktop user interface, to analysis of the functioning of the GEM software, user-friendly, graphics-based system.
- This is the first book to take full account of the changes in GEM since its early versions. Working with GEM is the definitive handbook for users and enquirers alike.

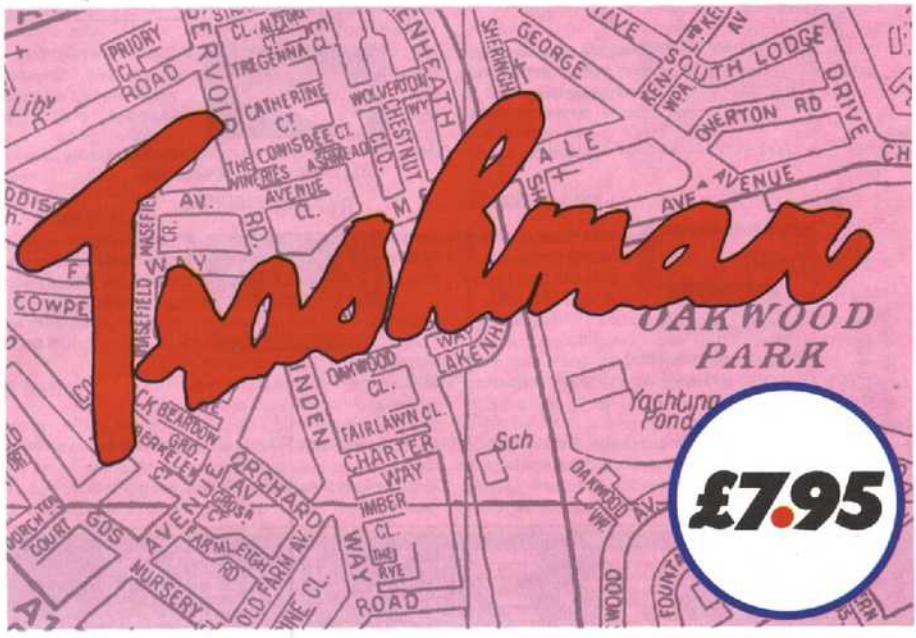


To Theresa Lacy, Sunshine Books
12/13 Little Newport Street
London WC2H 7PP

Please send me_____copies of Working with GEM on the IBM PC. ISBN 0 946408 85 8 at £12.95 (plus 90p p&p)

I enclose a cheque/postal order for £_____payable to Sunshine Books.
Alternatively please debit my Visa ☐ Access ☐
American Express ☐
Account Number _____ Expiry Date_____
Signed _____
Name (capitals please)_____
Address _____

IT'S WHAT YOU'VE BIN WAITING FOR!



TRASHMAN, *a smash hit on the* ***Spectrum 48k,*** *is now available for the* ***Amstrad CPC 464/664/6128.***

is a humourous arcade game in which you play a binman working in the neatly kept streets of suburbia.

In this time of high unemployment our Public Health Operative must impress his employers by working very hard.

Laden with heavy bins, he has to follow the dustcart. He can pick up a nice bonus by helping out the eccentric locals but too much tramping on well tended lawns may make the household pet a man-eater.

A game no Amstrad owner can ***REFUSE*** *– available from all good software retailers – or drop us a* ***LITTER!***

Name .....

Address .....

.....

Spectrum ☐ Amstrad CPC 464/664/6128 ☐

Tick appropriate box.

TRASHMAN *costs* ***£7.95.*** *Please make cheques payable to* ***Virgin Games Ltd*** *and post to the address below. Please do not post cash.*

Virgin Games Mail Order, *2/4 Vernon Yard, Portabello Road, London W11 2DX*

ADVANCE WITH SAGA

If you want the best from your Spectrum ensuring it advances with technology, then Saga Systems have the ideal keyboard for you. Look at the choices available.

Saga Systems Limited

SOFTWARE

T·H·E LAST WORD

With a database and spreadsheet to follow soon, when it comes to word processors we have The Last Word.

▶ **The Last Word** - Sinclair User Classic Award. £13.95.

KEYBOARDS

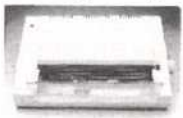
▶ **Saga 1 Emperor** - "Good looks ... works remarkably well..." Sinclair User. £39.95.

▶ **Saga 3** - "The best." Chris Jenkins, Popular Computing Weekly. The Last Word available with it free. £69.95.

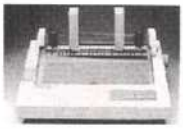
▶ **Saga 2 +** - "Well done, Saga." Sinclair User. £54.95.

▶ **Saga 2001.** Infra red remote transmission, out of this world. The Last Word available with it free. £119.95.

PRINTERS



▶ **LTR1 Printer.** Letter quality printer for only £119.95



▶ **The Citizen 120D** Precision dot matrix, with 2 year warranty. "The 120D is an excellent printer." Sinclair User. £235.00

▶ **The GLP** (Great Little Printer) Dot matrix printer, 100 cps, letter quality mode. £199.95

PERIPHERALS

▶ Microdrive extension cable for use with your Saga 3. £4.95.
▶ Sound Boost. To put music in your ears (and television) £9.95
▶ Flexicable enables you to drive 2 interfaces. £11.95
▶ Dust cover. To keep your computer and Saga keyboard clean. £4.95
▶ Centronics interface. To drive your printer. £34.95

SEND OFF NOW FOR FULL CATALOGUE OR CALL 04862 22977

Saga Systems Ltd.
Dept. PCW
Freepost
2 Eve Road, Woking
Surrey GO21 4BR

MODEM HOUSE

BARGAIN BASEMENT

AN EPSON PRINTER FOR £39.95?

YES THE EPSON P-40

IDEAL FOR USE WITH PORTABLE COMPUTERS AND/OR ANY COMPUTER WITH CENTRONICS OUTPUT

★ Thermal Dot-Matrix Printer
★ 45 cps Normal made – 80 cps condensed
★ ASCII 95 character set
★ 9 international Character Sets. Graphics plus normal enlarged condensed emphasised characters
★ Mains or Battery operated with nicad rechargeable battery included
★ Friction feed

MODEM HOUSE 70 Longbrook Street, Exeter, Devon EX4 7AP Tel: (0392) 213355

27PD262

File copy

In your issue dated November 21, 1985 you published a comprehensive database called *Com Filing System* by Wail Sabbagh. The final part of this program was in December 5, 1985.

After entering the complete listing I found the program useful and would recommend it to any small business user.

However, on return from holiday I discovered that my copy had gone missing. I would therefore be obliged if you could advise me whether the program is available on tape and at what cost.

James C Hardie
Kilswyth
Glasgow

You are in the hands of the author. If you'd care to write to him care of the magazine, we'll pass on your request.

Bigger and better

The Character Expansion program for the Amstrad CPC machines *(vol 5 issue 21)* from Brian Cadge works very well. My only regret is that it works on expansion only, and not on contraction.

It is indeed interesting to use smaller characters in mode 1, preserving the four-colour screen. We could also imagine the 80-column size in 16 colours in mode 0.

I would appreciate it if someone could suggest the modifications needed to make these improvements.

Jose L van der Zypen
Brussels
Belgium

Ancient games

Recently a friend of mine arrived back from Nigeria and brought a board game called Ayo.

Having played the game several times I was fascinated with its complexity. A visit to the library revealed that the game is a version of Mancala, one of the oldest board games known.

Can anyone tell me whether the game has been computerised, and where it is available?

B Clegg
Oldham
Lancs

Einstein theory

I have been an Einstein owner for two years and am surprised at the lack of support from the computing press.

It must be the most versatile home micro available.

Since joining the UK Einstein Users Group, the amount of information I get is wonderful.

For any Einstein owners out there who still feel cut off, can I suggest that they contact Jean Skillern, subscription secretary, UKEUG, 36 Nelson Row, Ford, Nr Arundel, Sussex.

Chris Giles
Portslade
Sussex

Which Amstrad

Whenever we are given a program in *Popular* the name of the computer is given at the top of the page. Spectrum and QL programs are not presented as "Sinclair", nor C64 items as "Commodore". So why can't we be told more than just the fact that a program is written for the Amstrad.

Anyone considering buying a word processing system might be persuaded to get a PCW8256 in the belief that they could also type in programs from magazine listings.

Alan Baker
Portsmouth

Right you are Mr Baker, which is why we started putting *8256* at the top of programs for that machine some weeks ago – see *Better Basic, Vol 5 issue 16,* for example.

Shock review

I simply had to write and tell you about a strange experience I had the other day. I read a John Minson Review that I agreed with! The shock of this was no small trauma, I can tell you! You must realise the importance of this unique discovery, the first of its kind.

I refer to that wonderful offspring of St Brides, *The Snow Queen.* I enjoyed John's review immensely . . . almost as much as the game.

I have considered *Quill* to be a competent atmosphericide, but in the hands of St Brides it creates pathos, humour, sympathy and overwhelming atmosphere in enormous dollops.

One incongruity is that in the light of their previous anarchic outpourings it is not unlike watching Brian Rix play Hamlet. One expects farce and instead we are treated to a wonderful story beautifully portrayed.

I must be mellowing in my old age as I not only enjoyed John Minson's style but I only found one bone to pick with him . . . my CBM64 has a RAM-SAVE facility. (What it doesn't have is a TEXT-only mode).

After 150 adventures I have begun to tire of the 'dubious morality' of most adventure scenarios. It is so nice to find one that requires one to do the 'right thing'. The image of the little girl setting off down the hill alone was a real tear jerker!

Hugh T Walker
7, Burnet Avenue
Burphaw
Guildford
GU1 1YD

Going public

I have been into computing for quite some years and have a variety of machines (Spectrum, Amstrad).

During that time I have written quite a few routines of various sizes and was wondering what to do to get them published in *Popular Computing Weekly*?

Richard Leadbetter
Cecil Park
London N8

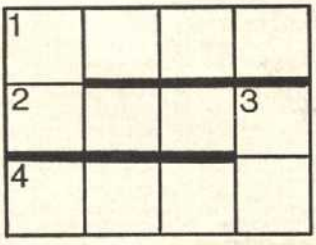
We are always looking for new listing ideas. What you must do is send us a working copy of the program together with some documentation you'd anticipate being published with it, marking the whole lot for the attention of technical editor Duncan Evans.

We pay £25 per page – or £5 for something appearing in Bytes & Pieces.

Puzzle

Puzzle No 215

In the following cross-number puzzle, numerical values and not words have to be fitted into the grid.



1. A^2 1. B
2. B^2 3. A
4. A * B

Can you find the correct values for A and B?

Solution to Puzzle 210

He has 126 blocks which fit into a 5 × 5 × 5 cube with one left over. These same blocks could be arranged to form a right-angled triangle with sides of 28, 45, and 53 units.

To solve this problem we need to find a right-angled triangle with integral sides and hypotenuse, in which the sum of these values is just one more than a perfect cube. Lines 10 to 60 do this, the two sides being taken and the length of the hypotenuse is calculated using Pythagoras' theorem. If this is an integral value the program calls the subroutine which checks to see if the sum of the three sides is one greater than a cube. Because of the inaccuracies in the calculation of cube roots directly, the program uses a circuitous method of multiplication to check if the value is an exact cube (lines 100 to 140).

As soon as a value is found, the program stops.

Winner of Puzzle No 210

The winner this week is D. Titley of Cottingham, Humberside. £10 is onit's way.

Rules

The closing date for puzzle No. 215 is July 29.

Evesham Micros

PRINTER OFFERS

Check out these offers on top quality dot matrix printers. All the models offered are substantially reduced from the normal high street prices. Prices are fully inclusive of VAT, delivery and lead to suit any computer with centronics parallel printer port. eg. Amstrad, B.B.C., Einstein, Atari ST, Oric, Dragon, Memotech or MSX. For the CBM 64/128 we supply a user port centronics cable. For Spectrum or QL owners an appropriate interface is supplied for an extra £20.00, for Atari models other than the ST an extra £30.00. Delivery is by insured receipted delivery and orders are despatched the next working day after receipt, provided we have stock.

SHINWA/MICRO P. CPA 80 +
NOW WITH NEAR LETTER QUALITY MODE

Improved specification makes this the **latest version** of this popular model, the **outstanding printer buy** in it's class. As well as it's normal **superb print quality** at 100cps (better than the NLQ on many rival models) it now has an **NLQ mode** which offers even better print quality. This can be switched in either from a **front panel NLQ switch** or from software. Other features are friction and tractor feed, external dipswitch, graphics mode, square needle print head (gives less dotty look to print) and Epson compatibility. Take a look at these unretouched actual size print samples.

New NLQ PICA print style
Standard PICA text (100cps)
True descenders on jpg etc.
ELITE mode gives 96 columns
CONDENSED mode gives 142 columns
ENLARGED mode
SUBSCRIPTS and SUPERSCRIPTS
underlines nicely
Good italic character set

We are convinced that this printer offers the best performance and value in its class and at our unheard of price is a **BARGAIN.**

ONLY £189.95

Price includes Centronics lead to suit your micro.
Or to suit Spectrum with Kempston "E" interface £209.95.

PANASONIC KX P1080

Now available at a really competitive price. This printer has a R.R.P. of £245 + VAT. Features are: 100cps; Friction and tractor feed; easy access "dip switch"; easy change long life ribbon and superb switch selectable NLQ mode. Take a look at these unretouched actual size print samples.

A sample of the impressive N.L.Q.
from the Panasonic KX P1080
N.L.Q. available in Elite (12cpi)
and italic modes.
Superb value from Evesham Micros
High quality from Panasonic
Two names you can trust

ONLY £199.95

Price includes Centronics lead to suit your micro.
Or to suit Spectrum with Kempston "E" interface £219.95

SPRING SPECIALS

ATARI 104ST mono	£799.00	CBM MPS803 printer	£149.95
ATARI 104ST colour	£999.00	5.25" 3M DISCS (packs of ten)	
(these prices INCLUDE VAT)		SS/DD £11.95	DS/DD £14.95
ATARI 520STM c/w SF354 Disk Drive	£449.00	or in plastic library case	
FREE "THE PAW" WITH ALL ATARI'S		SS/DD £12.95	DS/DD £15.95
OPUS DISCOVERY 1	£114.95	3.5"3M DISCS (packs often)	
CBM 128 computer	£229.95	SS/DD £29.95	DS/DD £39.95
CBM 128 compendium pack	£279.95	3" DISCS (suit Amstrad)	
CBM music pack	£149.95	BOX OF TEN	£39.00

STAR NL10

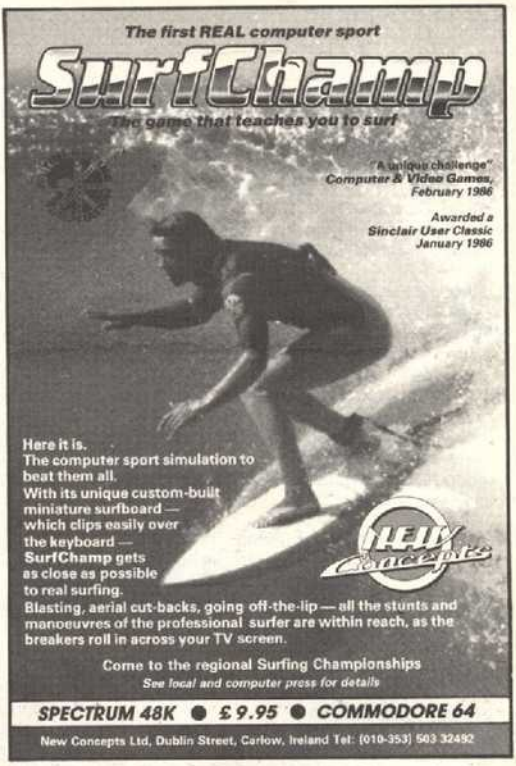
New high specification printer just released. All the usual features PLUS easy front panel selection of most modes, semi automatic single sheet feed AND plug in interface cartridges.Choose between standard centronics parallel, IBM, or Commodore. Ideal for Commodore owners who want the convenience of a CBM ready printer but may wish to change later, just buy a new interface cartridges for £39.00.

OUR PRICE: ONLY £269.00
(state which cartridge required)

All prices include P&P and VAT. Send cheque, Postal Order or Credit Card No. Credit Card order accepted by phone. Callers welcome. Wide range of goods stocked. Trade enquiries welcome. European orders send price as advertised. Outside Europe £2.00 for airmail. Mail order to Evesham Shop please.

EVESHAM MICROS
BRIDGE STREET, EVESHAM, WORCS., WR11 4RY.
Tel: 0386 41989

MICRO CENTRE
1756 PERSHORE ROAD, COTTERIDGE, BIRMINGHAM.
Tel: 021-458 4564



EDGE MEGASAVE SOFTWARE

46 THE MALTINGS, STANSTEAD ABBOTS, WARE, HERTS **27PD011**

SPECTRUM 48K	RRP	OUR PRICE
Pentagram	9.95	6.99
Starstrike II	7.95	5.75
Way of the Tiger	9.95	6.95
Spitting Images	7.95	5.75
Bobby Bearing	7.45	5.75
Turbo Esprit	8.95	6.60
Cyberun	9.95	6.99
World Cup Carnival	9.95	6.99
Rock n Wrestle	8.95	6.60
Heavy on the Magick	9.95	6.95
Spitfire 40	9.95	6.99
Jack The Nipper	7.95	5.75
Graph AD Creator	22.95	16.95
Bomb Jack	7.95	5.75
Green Beret	7.95	5.75
Kung Fu Master	7.95	5.75
Equinox	9.95	6.99
Killer Tomatoes	7.95	5.75
Alien Highway	7.95	5.75
Biggles	9.95	6.99
Lazer Genius	14.95	11.95
Tan Talus	7.95	5.75
Pyracurse	7.95	5.75
Sam Fox	6.95	6.60

	RRP	OUR PRICE
Iwo Jima	7.95	5.95
Theatre Europe	9.95	6.95
Action Reflex	7.95	5.75
Mantronix	7.95	5.75
Batman	7.95	5.75
Bounder	7.95	5.75
Ghosts and Goblins	7.95	5.75
Red Hawk	7.95	5.75
Spindizzy	9.95	6.99
Planets	9.95	6.99
Questaron	8.95	6.60
Toad Runner	8.95	6.75
COMMODORE 64/128		
PSI FI	9.95	6.95
Tau Ceti	7.95	5.75
Golf Construction Set	12.95	9.95
Tubular Bells	9.95	6.99
Shogun	9.95	6.99
Starquake	8.95	6.75
Way of the Tiger	9.95	6.95
Biggles	9.95	6.99
Germany 85	9.95	6.99
Nexus	9.95	6.99
World Cup Carnival	9.95	6.99

	RRP	OUR PRICE
Ghosts and Goblins	9.95	6.95
Timetraxx	9.95	6.95
Touchdown Football	9.95	6.99
Superbowl	9.95	6.95
Law of the West	9.95	6.99
Southern Belle	7.95	5.75
Knight Games	8.95	6.60
Solo Flight II	14.95	11.50
Green Beret	8.95	6.60
Max Headroom	9.95	6.99
Titanic	9.95	6.95
Lazer Genius	14.95	11.95
Silent Service	9.95	6.95
Doomsdarks Revenge	9.95	6.99
Mermaid Madness	9.95	6.95
Saboteur	8.95	6.75
Thrust	1.99	1.99
Int. Karate	6.50	4.95
Cauldron II	8.95	6.60
Sam Fox	8.95	6.60
Spindizzy	9.95	6.99
Solo Flight II (D)	19.95	15.95
Bored of the Rings	8.95	6.50
Price of Magick	9.95	6.99

All prices include free fast delivery & same day despatch, when available. Personal callers welcome. 5% discount on all orders for seven or more tapes or to a value over £40. Cheques/POs/ECs payable to EDGE. For up to date news on available & Access orders ring (0920) 870568. Free Game included for orders over £20 or overseas orders. Send SAE for free lists

ANCIENT & MODERN

Unit 111 (Rear), Washington Road, West Wilts Trading Estate, Westbury, Wilts

***LOOK OUT FOR THE SPECIAL SPECIAL PRICES ON US GOLD PRODUCT THIS WEEK ONLY!!**

COMMODORE 64	RRP	A&M
OFF THE HOOK	6.99	6.99
SILENT SERVICE	9.95	6.99
WORLD CUP CARNIVAL	9.95	6.99
WINTER GAMES	9.95	6.99
*KUNG FU MASTER	9.95	6.99
*TIME TUNNEL	9.95	5.99
*NATO COMMANDER	9.95	4.99
*BLUE MAX 2001	9.95	4.99
*INDIANA JONES	9.95	4.99
*QUASIMODO	9.95	4.99
*BLUE MAX	9.95	4.99
*ZAXXON	9.95	4.99
*BOUNTY BOB	9.95	3.99
*SENTINEL	9.95	4.99
*TAPPER	9.95	4.99
*DOUGHBOY	9.95	4.99
*CONGO BONGO	9.95	4.99
*BUCK ROGERS	9.95	4.99
*UP 'N' DOWN	9.95	4.99
*FORT APOCALYPSE	9.95	4.99
*MIG ALLEY ACE	9.95	4.99
*BRUCE LEE	9.95	4.99
*DROPZONE	9.95	4.99
*GOONIES	9.95	4.99
*SUPER ZAXXON	9.95	4.99
*IMPOSSIBLE MISSION	9.95	4.99
*SPY'S DEMISE	9.95	4.99
*AMAZONE WOMEN	9.95	5.99
*ZORRO	9.95	4.99
*BEACH HEAD	9.95	5.99
*RAID OVER MOSCOW	9.95	5.99
*KERMIT'S E.		
STORYMAKER	9.95	4.99
ALTER EGO (disc)	24.95	16.95
GAME MAKER (disc)	19.95	13.95
GAME KILLER	14.95	11.00
KEN. APPROACH D	17.95	12.95
STRIP POKER	9.95	6.99
TAPPER	9.95	6.99
MERCENARY	9.95	6.99
GOONIES	9.95	6.99

COMMODORE 16		
COMMANDO	7.95	4.50
JET SET WILLY	7.95	4.99
LEGIONAIRE	7.95	4.99
WORLD CUP		
CARNIVAL	9.95	6.99
GULLWING FALCON	6.95	3.99

ELECTRON		
JET SET WILLY	7.95	4.99
COMMANDO	9.95	6.99

BBC		
*DAMBUSTERS	9.95	4.99

SPECTRUM	RRP	A&M
OFF THE HOOK	6.99	6.99
WINTER GAMES	7.95	4.99
*DAMBUSTERS	9.95	5.99
*BOUNTY BOB	7.95	3.99
*TAPPER	7.95	3.99
*IMPOSSIBLE MISSION		
	7.95	4.50
*FLAK	7.95	3.50
SPY HUNTER	7.95	4.99
*BUCK ROGERS	7.95	3.99
*TWISTER	7.50	4.99
WORLD CUP CARNIVAL		
	9.95	6.99
FOURMOST ADVENTURES		
	7.95	4.99
PENTAGRAM	9.95	6.99
HEAVY ON THE MAGICK		
	9.95	6.99
GHOSTS AND GOBLINS		
	7.95	5.20
REDHAWK	8.95	6.20
QUAZATRON	8.95	6.20
KILLER TOMATOES	7.95	4.99
ROLLER COASTER	6.95	4.70
AUSTERLITZ	9.95	6.75
YIE AR KUNG FU	7.95	5.40
BOUNTY BOB	7.95	5.40
WHAM MUSIC BOX	9.95	6.99

All prices inc. Vat and P & P. Overseas please add 75p per tape. Thousands of titles in stock. Please send SAE for full list stating machine. Cheques/POs payable to Ancient and Modern. Visit 111 (Rear), Washington Road, West Wilts Trading Estate, Westbury, Wilts. **PD702A**

Spectacular Spectre communications

John Lettice takes a hard look at the latest Spectrum hardware

It's an ill wind that blows nobody good, and the conspicuous lack of QL owners beating a path to Tandata's door to buy the QMod V23 modem has created an entrepreneurial opportunity for Spectre Communications. Take one QMod, attach a Rom-based Spectre Comms pack for the Spectrum and you've got a neat setup that will operate at 1200/1200/75 and 300/300 (sort of) for under £100. Spectrum owners are of course liable to be a bit perplexed when they unpack the kit and find the packaging's got "QL" written all over it, but no matter.

The comms package is available separately, but is designed to match the QMod, the complete kit consisting of two black boxes that stack together at the rear of the machine. Plug in the comms pack, fit the QMod onto the expansion bus on top of it, switch on and you're ready to roll.

The Rom software cuts in immediately on power up, and presents you with an options menu allowing you to log on or off, go into viewdata terminal mode, save, view or print frames (on a ZX Printer), download software, edit messages and frames or go into scrolling bulletin board mode.

The main options menu will either execute the function directly, or will move into a sub-menu presenting other options, log on/off, for example, being split into auto log on, manual log on and log off. If you choose either of the first two you part company with the user friendly menu system at this point, as the procedures are the same, and you're simply presented with the query "Identity?" Reference to the manual, however, reveals that auto log on is for use with Prestel systems, where identity and password can be entered prior to logging on. This stores the identity and password string in memory, while manual log on is the same, except that it doesn't.

This is one instance where the menus, although nearly user-friendly enough for you to be able to do without a manual, fall down. There's also a problem here with the comms pack itself, which has two switches; a line switch and a mode switch, but as neither is labelled, and the manual fails to tell you which is which, it's possible some users will be confused.

Even new users should be able to work it out with a bit of thought, but a couple of sticky labels wouldn't go amiss here, and a couple of extra lines in the software indicting which switch is which would also be helpful. For the record, the line switch is the one on the right, while the left hand one, the mode switch, takes you between 1200/1200 and 1200/75. The latter is accessed by pushing the mode switch in, and the former by 'out'. Actually getting onto a system is easy, though again it could be a little more obvious. The Spectre doesn't support auto-dial, so with the line switch out you phone the system then push it in when you get a carrier. You're then effectively into the system.

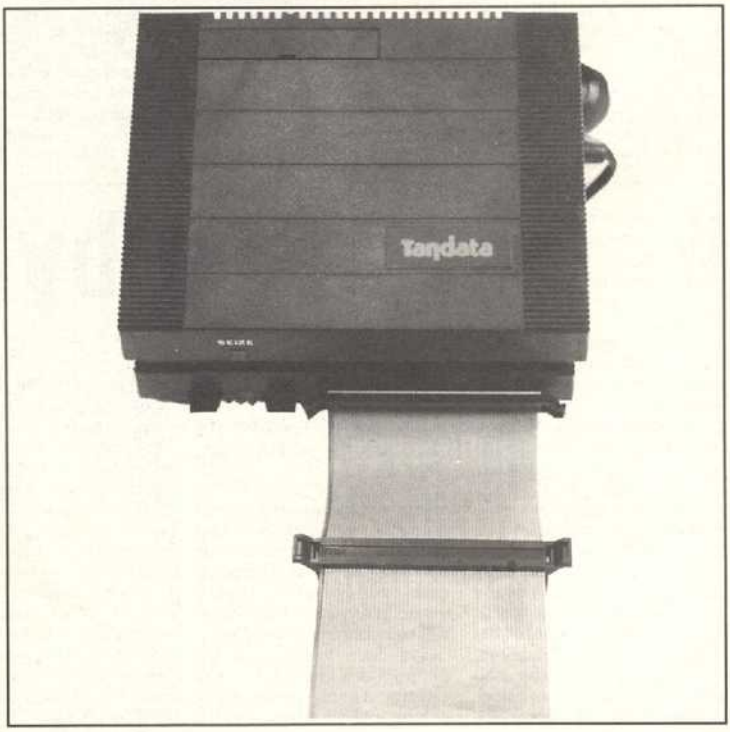
The Spectre seemed to log onto Prestel easily enough, and although I initially had trouble with Telecom Gold at 1200/75 and 1200/1200 this seemed to be related to the speed with which the software reacted to a carrier (Gold drops you very quickly if it thinks you're wasting its time) and – possibly – to line noise, the local phone system not being all it might be.

Storage and printing of frames are among the bells and whistles. Frames can be stored on tape or Microdrive, or can be placed in memory, while although printing is normally on a ZX Printer the manual does tell you which line to modify if you want to use a different printer. In addition to this there's a downloading menu, and offline editing for messages. Bulletin board access is catered for at 1200/75 and 1200/1200, but 300/300 can be produced by a simply wiring job on a cable to Spectre's built-in RS232 port (Sinclair Interface 1 standard), and by using an external V21 or V23 modem. The scrolling terminal menu controls bulletin board protocols, and can be used to alter word length, parity, stop bits, echo and line feed.

From the Spectrum owner's point of view I'd say the Spectre package is decidedly A Good Thing. It's got a certain amount of flexibility to it in that you aren't tied to owning a dedicated Prestel machine, yet it's simple enough to use for it to be attractive to people new to communications. It would have been nice to have 300/300 built in, and nice to have just a shade more nursemaiding from the software, but overall I'd say it was a good buy.

John Lettice

Product *Spectre Communications pack* **Micro** Spectrum 48/128K **Price** £94 **Supplier** Spectre Communications, The Old School House, Tenter Row, Crosby Ravensworth, Penrith, Cumbria CA10 3JA (0931 5362).

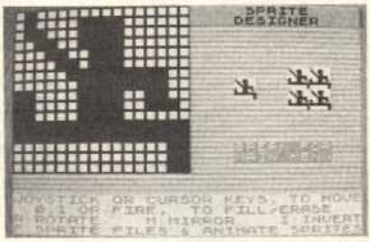


Do-it-yourself games

It's a while since we've seen one of these on the Spectrum; the games writing package to let the non-programmer write his or her own masterpiece of arcade action. Sure there are packages like *Laser Basic* which make it easier to emulate Denton Designs, but this is aimed at the complete klutz end of the market.

With two tapes and an instruction manual, it's a well packed package. First up is a graphics designing kit, which works well. You can create and animate smallish sprites, and a similar grid lets you design UDGs for the scenery in front of which life or death battles will be fought. With mirror, rotate and inverse instructions, plus on screen prompts for filing and testing, even I found these easy to use.

Rather less satisfactory is the sound facility. Not that it's complex but it's rather a matter of trial and error to arrive at that satisfyingly rude rasp you've always been listening for. There's also the opportunity to design the screens, and you're given a warning if they begin to eat up too much memory. Clearly careful planning will be necessary if you're to make the best of this facility, and don't expect to come up with a landscape as attractive as *Fairlight*'s!



The sprite designer allows you to create your game characters for later animation.

The demo game, Apple Picking, shows you what is – and isn't – possible.

Save your data once you've completed the Leonardo stage – and how good to see a verify facility – then turn over the tape and what's this? A demo game lurks on side two and as you play a horrible realisation dawns. Once you've created all those unique UDGs and sparkling sprites, there's damn all you can do with them!

The instructions fail to make it clear that before you create the game with tape two, side one, you need to initialise a blank tape from tape two, side two – one of the two serious omissions that I noticed. You then specify which sprites will be used where; how points will be scored and the nature of time bonuses; and the directions of the nasties that you'll be unleashing on the unwitting player.

But the big decision is what type of game you're creating. Ultimate style 3D? Mel Croucher conceptual? Elite epic? Think again. The choice is pure and simply shoot 'em up vs platforms and ladders. Or to put it another way, *Invaders* with frills or *Manic Miner* without Willy; the games you grumble about, even if they only cost £1.99!

You can mix the two types within any one game but then another horrible realisation dawns. There is no facility for automatically moving to the next screen once you've completed one; it's all done by pressing 'E' (the other thing the instructions neglect to mention).

This does make serious game writing near impossible.

In the long run you'll need to ask yourself why you want such a package. If it's merely for a bit of fun and the creation isn't the thing, then *Arcade Creator* is simple to use and does what it aims to do. But if you want to write games that anyone would want to play, this is just not enough. You'd do better spending some time actually learning to program your Spectrum.

John Minson

Program *Arcade Creator* **Micro** Spectrum 48K **Price** £14.95 **Supplier** Argus Software Group, Liberty House, 222 Regent Street, London W1R 7DB.

Kissed by DeBug

Kissed from Microdeal, is not, as the title would suggest, the latest in tacky games, but a very comprehensive machine code debugger.

What's on offer then is full screen editing, five multiple pass breakpoints, tracing and executive options, a disassembler and mini-assembler, memory block manipulation commands, completely isolated screens from target, relocation of program, keyboard escape and a dump to printer option.

Kissed itself occupies only 12.5K, however the memory used can be as much as 45.25K depending on the size of the isolated window required. Also, the program can be used with either mono or colour monitors/TV's as there are separate versions supplied on the disc.

The accompanying manual starts well enough but rapidly acquires the clarity normally reserved for printer documentation. An inexperienced programmer will find the latter sections all but impenetrable, but then is, what Microdeal calls, 'the ultimate debugger' aimed at anyone but the experienced machine code user?

The main functions of the program are the memory and register dumps, all of which can be altered easily, and the disassembler. An interesting extra feature is the ability to 'patch' single lines of assembler onto the disassembler to cover bugs or things forgotten. Inserting code larger than the space you wish to enter it in will result in the code next to it being overwritten, so care must be taken when doing this.

Blocks of memory may be moved, filled with specified characters, verified or have search and replace actions carried out on them. This feature can be quite useful, if not immediately so.

Using the execution options the target program can be run, with checking on various system pointers. However, care needs to be taken to avoid crashing the system on return to TOS.

If this is the sort of package you've been after, look, despite the dire manual, no further.

Duncan Evans

Program *Kissed* **Micro** Atari ST **Price** £29.95 **Supplier** Microdeal, Box 68, St Austell, Cornwall PL25 4YB.

ATARI ST

Power Without The Price!

FREE SOFTWARE

When you buy one of the new Atari ST computers from Silica Shop, you will receive a large and varied software package free of charge. This package covers several applications and comprises a total of nine titles. All ST's now have TOS/GEM on ROM, and the total list of free software is as follows:

1) GEM - *DR Desktop environment with WIMP (in ROM)*
2) TOS - *Tramiel Operating System (in ROM)*
3) 1st WORD - *Word Processor by GST using the GEM environment and multiple windows*
4) BASIC - *Personal Basic by DR (with manual)*
5) LOGO - *Logo language by DR (with manual)*
6) DOODLE - *Simple paint/doodle drawing package (works on mono or colour systems)*
7) MEGAROIDS - *Asteroids type game by Megamax*
8) NEOCHROME - *A powerful colour paint and graphics package (only useable with colour systems)*
9) CP/M EMULATOR - *Allows the use of DR's Z80 C/PM software to run on any ST system*

3rd PARTY SUPPORT

The power and potential of the ST range of computers is causing a flood of new software titles, peripherals and accessories from third party manufacturers. Titles range from word processing to spreadsheet programs, from graphics and games to database management - all with those easy drop-down menus and windows. With the list of companies producing ST software including dozens of top names, you can expect some first class titles for the new ST range. The following includes a selection of the third party manufacturers who have developed, or are working on, products for the ST range:

ABACUS	EXTENDED S/W	MICRO-ED INC	ROBINSON SYS
ACADEMY	FIDELITY	MICROPRO	SCARBOROUGH
ACCOLADE	FIRST BYTE	MICROPROSE	SIERRA ON LINE
ACTIONSOFT	FIRST PUBNG	MICROPRO ENG	SM SOFTWARE
ACTIVISION	FLIP 'N' FILE	MIGRAPH INC	SOFTEK
ADVENTURE INT	GLENTOP PBNG	MILES COMP	SOFTLABS
AMTIC	GST SYSTEMS	MIRACLE	SOFTLOGIK
AMERICAN COVERS	HABA	MIRAGE	SOFTWARE COMS
ARTWORX	HAYDEN	MIRRORSOFT	SECS
ASHTON TATE	HIPPO	MONARCH DEV	SOFTWARE PUNCH
ATI	HISOFT	MOSAIC	SOFTWORKS
AUDIO LIGHT	INFOCOM	MULTIFORM	SORCIM/RUS
AZTEC	INSIGHT	MULTIMATE	SPINNAKER
BATTERIES INC	INSOFT	OCEAN	SST SYSTEMS
BAYVIEW	ISLAND LOGIC	ODIN	STONEWARE
BECKEMEYER	KNOWLEDGWARE	OMNITREND	SUBLOGIC
BETTER WORKING	KUMA	OSS	SUNDATA SERVICES
BLUE CHIP	LASERSOFT	OTHER VALLEY	SUNSHINE BOOKS
BOS	LEVIMER	OXXI	SUPPLEMENTAL
CASHLINK	LEVEL 9	PAPERLOGIC	SYSTEMATICS
CHANG LABS	LIONHEART	PARADOX	TALENT
CHELTEK SYST	LLAMASOFT	PENGUIN	TDI
CHIPSOFT	LONGMINSTER	PHILON	TELARIUM
COMPUTE!	MAINTHINK CORP	PLANNER	TK COMPUTER PRO
CROSSBOW MUSIC	MAP COMPUTERS	PLANTIR	TOP EXPRESS
DATABENCH	MARK of UNICORN	PROGRESSIVE	TOWNGATE
DATACOM SYS	MARK WILLIAMS	PROSPERO	TYNESOFT
DATA SYSTEMS	MARTIN CONSU	PRYORITY	UNISON
DELTRON	McGRAW HILL	PSION	VIP
DILITHIUM PRESS	MEGAMAX	PSYGNOSIS	WASON MICROCHIP
DRAGON GROUP	MEMOREX	QUICKVIEW SYS	WHITEGALE
DUFOSE PUBNG	METACOMCO	RAINBIRD	WINDHAM CLASSICS
ELECTRONIC ARTS	MICHTRON	REGENT	WORD of GOD COM
EXECON	MICRODEAL	RISING STAR	XLENT

520ST-M

NEW 512K 520ST-M KEYBOARD: The new 520ST-M keyboard costs only £346.96 (+VAT=£399) and is yet another price breakthrough for Atari Corporation. The keyboard now includes both an RF modulator and cable, allowing you to connect it to an ordinary domestic television set. In addition, the keyboard is supplied with 512K RAM, a mouse and a free set of 3½" disks containing applications software. The TOS operating system and the GEM graphics package are now supplied on 192K ROM chips which are already installed in the keyboard. This means that the operating system will automatically boot in when you switch the power on. In addition to the keyboard, you will also need to purchase either a 1Mbyte disk drive (RRP £130+VAT) or a 1Mbyte disk drive (RRP £174+VAT). Either disk drive will provide you with fast information retrieval and a vast amount of storage space. If you prefer not to use your own TV set, you may connect your ST to a monitor. You may purchase the Atari SM124 monochrome monitor (RRP £130+VAT), or one of Atari's two Thomson colour monitors. Alternatively, you may choose one of the many third party colour monitors which are available.

NEW 1024K 520ST-M+ KEYBOARD: In addition to the standard 520ST-M, we have a new keyboard which we are calling the Atari 520ST-M+. The M+ is a 520ST-M keyboard which has been enhanced by a third party RAM upgrade to 1 megabyte of memory. The 520ST-M+ is available from Silica at a retail price of only £433.91 (+VAT=£499). This product will provide you with an alternative to the 1040ST-F, but at a lower price. Additionally, it features the advantage of the 520ST-M's built in modulator.

£347

1040ST-F

For the businessman and the more serious home user, Atari have introduced the 1040ST-F, a low cost powerhouse which can be introduced to a business environment as a stand-alone system, or can support a mainframe computer as a terminal. The new one megabyte 1040ST-F enhances Atari's 'value for money' reputation in the marketplace as it is the first personal computer available with one megabyte of memory for less than £500. You can purchase the 1040ST-F as a monochrome or colour system. The price of the monochrome system is £799 (+VAT = £918.85), with the colour system at only £999 (+VAT = £1148.85). The new 1040ST-F not only features twice as much memory as the 520ST-M, but also includes a one megabyte double sided disk drive and mains transformer, both built into the console to give a compact and stylish unit with only one mains lead. The 1040ST-F is also supplied with a free software package. Unlike the 520ST-M, the 1040ST-F was manufactured solely with business use in mind and as such is supplied with a monitor. It does not include the RF modulator or lead. We now have stock of the 1040ST-F at all four branches of Silica Shop. Call into your nearest branch for a demonstration.

1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX
117 Orpington High Street, Orpington, Kent, BR6 0LG
Lion House (1st floor), 227 Tottenham Court Rd, London, W1
Selfridges (1st floor), Oxford Street, London, W1A 1AB

£799

THE ATARI EXPLOSION!

If you read the specialist computer press, you will have noticed that there is one company which is getting a large slice of editorial space at the moment, that company is Atari Corporation. Atari have been making the news since the launch of their new 16/32 bit range of ST computers. Led by the powerful figure of Jack Tramiel and under the banner 'Power Without The Price', Atari are manufacturing new computers at unheard of prices, with the power to challenge firmly established market leaders. With the introduction of IBM compatibility, a CP/M emulator, a powerful networking system and a communications package for their new low cost powerhouses, it doesn't look as if it will be long before there is an explosion of the magnitude which will see Atari placed firmly besides such names as IBM and Olivetti in the personal computer marketplace. Read on for more details of what Atari are doing, and how they are putting their 'Power Without The Price' computers beyond the reach of the competition.

FREE CP/M EMULATOR

This newly announced CP/M Emulation Package, will enable software written under Digital Research's Z80 CP/M operating system to be run on the ST family of computers. There are several thousand applications written for CP/M in the UK alone, and several of the major CP/M software development houses may convert their programs to 3½" disk format for the ST range. The CP/M emulation package is supplied FREE OF CHARGE by Silica Shop with all ST computers.

IBM COMPATIBILITY

To make the ST available to those businesses who currently run IBM systems and are looking for a low cost expansion method, Atari have announced a co-processing unit for ST computers. This processor will open the ST range to all IBM or IBM compatible software applications. The unit, which attaches to the ST computers via the DMA (Direct Memory Access) port, contains an Intel 8088 processor with 512K of RAM and will accept a 5¼" disk drive. In it's ST mode, the unit will also act as a second disk drive, offering the user an additional 500K of memory. The IBM co-processing unit should be available in late Summer 1986. If you would like to be informed when it is released, please complete and return the coupon below. We will send you further details as soon as we have them.

20Mbyte HARD DISK £739

The new Atari hard disk for the ST range has just been released. All ST computers already have a hard disk interface built into them so there is no external interface required. The memory size of the disk is a massive 20 megabytes (unformatted) with a data transfer rate of 1.33 Mbytes per second. At a price of £739 (+VAT=£849), the 5¼" hard disk offers massive storage with fast access at a very reasonable price.

NEW ST SOFTWARE PACKAGES

There are now hundreds of software packages which have been announced for the Atari ST range. Titles available now include DB Man, a DBase 3 clone as well as H & D Base, a DBase 2 clone. In addition, PC Intercomm is a VT100 emulator which enables you to use any ST keyboard as a terminal connected to a mainframe or mini. Other programs include a Lotus 1-2-3 clone (see paragraph below).

VIP PROFESSIONAL - LOTUS 1-2-3™ CLONE

This is probably the most impressive program to have been released so far for the ST range. VIP Professional is an extremely easy to use, integrated spreadsheet, database and graphics program which is identical both in features and commands to Lotus 1-2-3™. The same spreadsheet analysis, information management and extraordinary business graphics are all combined in one easy to learn, affordable package. What's more, VIP Professional not only has all the features of 1-2-3™, you can also type the same commands to do the same things. Probably the most surprising feature of VIP Professional is not its total compatibility with Lotus 1-2-3™, nor its ease of use, but its price. Lotus 1-2-3™ for the IBM PC/AT costs £395 (+VAT=£454.25), whereas VIP Professional for the ST is a mere £169 (+VAT=£194.35). That's less than half the price! If you would like further details of VIP Professional, please return the coupon below.

SILICA SHOP

ATARI **WE ARE THE UK'S No1 ATARI SPECIALISTS** ATARI

At Silica we have been successfully dedicated to Atari ever since their products first appeared on the UK market. We can attribute our success largely to the Atari specialisation which we practice and to the user back-up we provide. Rest assured that when you buy a piece of Atari hardware at Silica you will be fully supported. Our mailings giving news of software releases and developments will keep you up to date with the Atari market and our technical support team and sales staff are at the end of the telephone line to deal with your problems and supply your every need. With our specialist bias, we aim to keep stocks of all the available Atari hardware, software, peripherals and accessories. We also stock a wide range of Atari dedicated books and through us, the owners on our list can subscribe to several American Atari dedicated magazines. We can provide a full service to all Atari owners and are now firmly established as the UK's NUMBER ONE Atari specialists. Here are just some of the things we can offer to our customers.

- ★ FREE POST & PACKING ON MAIL ORDERS
- ★ FREE NEXT DAY DELIVERY
- ★ INFORMATION MAILING SERVICE
- ★ TECHNICAL SUPPORT TEAM
- ★ HIGHLY COMPETITIVE PRICES
- ★ AFTER SALES SUPPORT SERVICE
- ★ REPAIR SERVICE ON ATARI PRODUCTS

If you would like to be registered on our mailing list as an Atari computer owner, or as a person interested in buying an Atari machine, let us know. We will be pleased to keep you up to date with new Atari developments free of charge. So, return the coupon today and begin experiencing a specialist Atari service that is second to none.

SILICA HOTLINE ☎ **01-309 1111**

SILICA SHOP LTD, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

SEND FOR FREE ATARI ST LITERATURE

To: Silica Shop Ltd, Dept PCWK 0786, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

PLEASE SEND ME FREE LITERATURE
ON THE NEW RANGE OF ATARI ST COMPUTERS

Mr/Mrs/Ms: ..... Initials: ..... Surname: .....

Address: .....

.....

.....

.....

Postcode: .....

Do you already own a computer
If so, which one do you own? .....

Bouncy Reflective (Reflex) Action

Spherical objects. They're getting everywhere nowadays and it's time decent minded people put a stop to it I say. What started with *Marble Madness* and *Bounder* has continued with *Bobby Bearing* – and now *Action Reflex*. Where will it end? Well, in this case, the list ends with an altogether above average arcade game.

With a name like *Action Reflex* you'd expect to be ducking and diving, dodging and weaving amongst the alien hordes, blasting away like there was no tomorrow. Not so, as this one requires quickness of thought in addition to some pretty nifty joystick skills.

The general idea is to guide your bouncing ball (an escapee from an Amiga demo I would guess) through screens against time – but whereas *Bounder* had you bounce onto objects, in *Action Reflex* you must bounce over them; contact with some meaning instant death (you get resurrected but lose valuable time), others simply get in the way.

All this is done against time in simple, but effective 2-D graphics – the object being to complete the maze of screens within a certain period and to collect bonus points which will help you on your way.

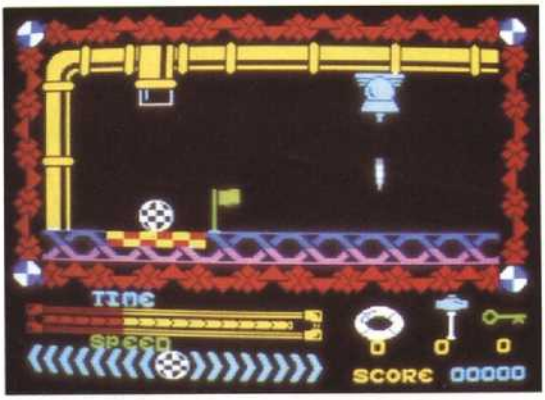
Controls are easy – left/right and fire to control the height of bounce.

A few minutes play shows the thought that has obviously gone into the design. To overcome some obstacles, you must bounce from another screen while others require careful positioning.

This is a game more of strategy than of reflex, but if you're in the market for an imaginative, original arcade title, *Action Reflex* is in with a shout.

Despite the hackneyed subject matter, you might still have a ball.

John Cook



Program *Action Reflex* **Micro** Spectrum **Price** £7.45 **Supplier** Mirrorsoft, Purnell Book Centre, Paulton, Bristol BS18 5LQ.

Fun For Every Knight

As game titles go, something like *Summer Games* or *Winter Games*, is reasonably self-explanatory. But *Knight Games?* All becomes clearer and thoroughly more logical when you realise that what we have here is a game involving things medieval.

Think of across between *Exploding Fist* and *Summer Games* (Fifteenth Century style) and you won't be going far wrong.

Knight Games is a multi-loader, consisting of six combat games (Swordfight 1 and 2, Quarterstaff, Ball & Chain, Pike Staff and Axeman) and two 'hit the moving target' games (Crossbow and Archery). Before that word 'multi-load' has you running for the Valium, you'll be pleased to know that the average waiting time is about two minutes.

The major hallmarks of all the events, however, are the superb graphics and sound. These are some of the most brash an colourful screens you have ever seen on a 64 with some excellent original sound effects and music (with suitable heraldic overtones). No complaints in this department, squire – but how do the events play in themselves?

There's no denying that despite the differences in weapons, many of the combat events play in very similar fashions Controls are the same for each – with defensive moves on the joystick diagonals and attack using the verticals/horizontals – a total of eight, not including movement left and right.

With the exception of Quarterstaff – despite the animation being changed each event – the overall feel is not radically different. Despite this, there's no denying that there is still a great deal of enjoyment to be had – particularly in two player mode.

Hack, clang, hack – not much subtlety here maybe – but it's great fun nevertheless, and it's certainly fast and furious.

The 'target' events are a simple hand-eye co-ordination, with the added spice of an unsteady cursor (with which you aim your shot) and the fact that you're competing against time.

Knight Games may not the most challenging of combat/sports type programs. What it is, is a game that will charm you with its colour and atmosphere. Combine this with a playability which will entertain without stretching any mental ability and you have a hit that will particularly appeal to the younger player.

John Cook

Program *Knight Games* **Micro** Amstrad **Price** £8.95 (tape) £14.95 (disc) CBM £8.95 (tape) £12.95 (disc) **Supplier** English Software, 1 North Parade, Parsonage Gardens, Manchester, M60 1BX.

Masterful

If Mastertronic keeps this up, the other budget labels might as well quit now. *Speed King*, the latest, is a winner all the way with fine graphics and sound effects, and non-stop action.

Yes, I know there've been racing simulations before but this one is so well done it deserves a place in the cassette player of every C64 and 128 owners.

At two quid it's an offer you can hardly refuse, and the exe-

cution is so good I'd pick it over *Revs*, *Pole Position* et al.

Speed King is a motorbike simulator, and the animation is great. As you take the corners, your rider leans into the bend, dropping his head to watch the road. Open the throttle as you come through and he slides back into position.

You'll find yourself leaning in your chair through the esses.

There's a host of options too. Ten circuits including Brands Hatch and Silverstone, three skills levels, practice laps, and races against 19 kamikaze opponents who give no quarter on the track. You can vary the number of laps per race too.

One nice feature is that the game records lap and race times for every combination of track and race-length, so you can play against friends or challenge for your own personal records.

Speed King is little short of brilliant.

Peter Worlock

Program *Speed King* **Micro** Commodore 64/128 **Price** £1.99 **Supplier** Mastertronic, 8-10 paul Street, London W1R 7DB.

Blackstar Classic

You can't keep a good man down" is a rather old saying. Well in this case it should be "You can't keep a good game down" and it aptly applies to *Blackstar*. Originally released by SCR for the Spectrum, this adventure has seen more labels than a can of beans. However, in saying that, *Blackstar* or *Castle Blackstar* as it was first known, still ranks as one of my old time favourites.

The objects of the game is to find a mystical Orb and return it to the Fair Lady Artemis. Your explorations begin above ground and gradually move into the Castle where all sorts of devious problems, gloomy locations and astounding events await you before tackling the locations below the Castle.

The descriptions in this text-only adventure are long and satisfying, building up a world where anything is likely to happen, and invaribly does, but the programmers have had the good sense to include a Ram-save and my advice is to use it regularly (programmers please note).

Before this particular quest is over you will have encountered such notable characters as 'The Hydra' who is rather spartial to ginger-bread, a wicked witch – "anybody fancy a flying broomstick", and the proverbial Dwarves, (well I mean, what adventure is complete without a Dwarf or two).

R Garrett

Program *Blackstar* **Micro** Amstrad CP6128/PCW8256 **Price** £7.99 **Supplier** CRL Group Ltd, CRL House, 9 Kings Yard, Carpenter's Road, London E15.

Floyd the Funny Droid

I must admit that opinion is divided, but I for one would defend *Floyd the Droid* just on the grounds of its title, even were it not an original and visually engaging romp.

This Dutch import features a sewer-cleaning robot – none of the glamour of interstellar warfare here. Your task is to pre-program the droid to deal with the rats, bats, lizards and assorties nasties lurking in the sewers, then guide him around the network cleaning it out.

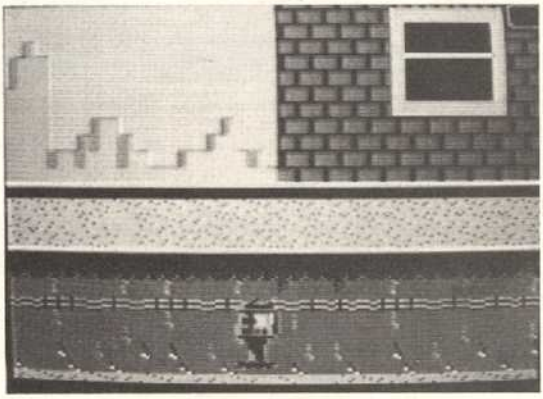
As you cruise the sewers, the cleverly animated droid shouts 'BOO!' at your command to flush out the vermin (good speech synthesis here). Having smelled a rat, your viewpoint switches from the usual 45 degree perspective to a side-on view. You must now choose the appropriate sequence of actions – jumping, shooting, running forward, and so on – to exterminate the vermin. You can either do all this with the joystick, or pre-program a sequence in the Procedures screen. It's not possible to pre-program a procedure to deal with the rogue droids which sometimes attack you: you have to fight them manually.

The aim of the game is to clean out the sewer system as quickly as possible, while sustaining as little damage as possible and covering the ground efficiently.

Floyd the Droid has lots of good points, not least nice graphics, light-hearted sonics and very original game play. The office sceptics would point out, though, that it's frustratingly slow to play – a major drawback to what could otherwise have been an excellent title.

Chris Jenkins

Program *Floyd the Droid* **Micro** CBM 64 **Price** £9.95 **Supplier** Ariolasoft, 68 Long Acre, Covent Garden, London WC2.



About as fun as Earwig Racing

Picture this:

Scott: Mah bonny wee engines captain – they can't take it. (Cut to Scott, pieces of plyboard and polystyrene falling aroundhim. Screen shudders.)

Engines: Whheeoinggg . . . blurp. (Silence. Extras pick themselves up off floor nursing bruises.)

Scott: It's no good captain, she's lost all power . . .

The theory, I suppose, is fine. If the BBC can whang out interminable repeats of outmoded space operas, and still having people in their thousands eating them off a stick, it should also be possible to make a killing by chucking out Basic programs with laughable graphics, dodgy routines and a space hook. Hello Bug-Byte, hello *Star Force Seven*.

I'm a sucker for management games, and bearing in mind the fact that many of the all time greats are humourous on a par with *Star Force Seven* I braved the howls of derision from the rest of the office and gave the game every chance. It's basically (Basic-ally?) text, with a couple of unimpressive graphics thrown in, and the script goes something like 'Take this battle fleet and cruise around the galaxy beating hell out of the Thuggoid empire.'

To do this you orbit a planet, bombard it (gronk gronk, said the guns), then assault it from the air, then on the ground. Once you've done this you replenish your forces, then it's off to the next exciting planetary attack. As an intellectual challenge it's just north of earwig racing. There's another bit that covers space combat, but that's boring too. No. No. No.

John Lettice

Program *Star Force Seven* **Micro** BBC B/Electron **Price** £1.99 **Supplier** Bug Byte, Liberty (Huh!) House, 222 Regent Street, London W1R 7DB.

THE SMASHING NEW GAME FOR C16 LOVERS

WIMBLEDON

AVAILABLE NOW!
£7·95

C16
Plus 4

Why wait for a bright summers day when you can enjoy the excitement of this addictive sport and test of agility and skill in the comfort of your own home.

GREMLIN

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

YOUR LOCAL SOFTWARE MAIL ORDER
ONLY A POST BOX AWAY

FACULTY ENTERPRISES LTD

AMSTRAD	£
SOLD A MILLION	6.65
YIE AR KUNG FU	5.99
RAMBO	5.99
BATMAN	5.99
PING PONG	5.99
BRUCE LEE	5.99
SABREWOLF	4.99
ALIEN	4.29
GRAND PRIX DRIVER	4.29
SNOOKER	4.29
FRIDAY 13th	3.39
KUNG FU IN LAS VEGAS	3.39
CHOPPER SQUAD	3.39
3D-STUNT RIDER	3.39
SPLAT	2.59
JET BOOT JACK	2.59
WARLOARD	2.59
HARRIER ATTACK	2.59
RED COATS	2.59
SPECIAL OPS	2.59
BLAGGER	2.59
STOCKMARKET	2.59
INCA CURSE	1.99
SHIP OF DOOM	1.99

COMMODORE	£
PING PONG	6.95
SUPERBOWL	6.95
SOLD A MILLION II	6.95
WINTERGAMES	6.95
HARD BALL	6.95
TIME TUNNEL	6.95
DRAGONSKULE	6.95
BACK TO THE FUTURE	6.95
KORONIS RIFT	6.95
KUNG FU MASTER	6.95
EIDOLON (64/128)	6.95
YIE AR KUNG FU	5.99
ELECTRA GLIDE	5.99
BUCK ROGERS	4.99
SUPERMAN	4.99
ZORK 1, 2, 3	4.99
REACH FOR SKY (C16)	4.99
BLUE MAX	4.29
PSI WARRIOR	4.29
FRIDAY 13th	3.39
PINBALL (CARS)	2.59
VIEW TO A KILL	2.59
TITANIC	2.59
AUTOMANIA	1.99
LAZY JONES	1.99

SPECTRUM	£
ELITE (+)	10.15
SUPERBOWL(+)	6.65
SOLD A MILLION	6.65
MAX HEADROOM	6.65
RAMBO	5.39
WINTER GAMES	5.39
MOVIE	5.39
PING PONG	5.39
INT. KARATE	4.99
RIVER RARO	4.29
BLUE MAX	4.29
PSYTRON	4.29
FRIDAY 13th	3.39
A VIEW TO KILL	2.59
CODE NAME MATT II	2.59
DEVIL RIDES IN	2.15
SPECTRUM CHESS	1.99
BLACK HOLE	1.99
WORLD CUP FOOTBALL	1.99
JUMPING JACK	1.99
TITANIC	2.59

BBC + ELECTRON	£
ALIEN	4.35
POLE POSITION	4.35
ROBOTRON	4.35
KENSINGTON	4.35
ROYAL QUIZ	3.20
MUSIC QUIZ	3.30
BEACH HEAD	3.20
GREMLINS	3.20
JET BOOT JACK	2.20
MOON RAIDER	1.99
TIME MACHINE	1.99
BATTLEZONE 2000	1.99
BISMARK	1.99

ELECTRON	£
ROBOTRON	4.35
SNOOKER	3.20
ROYAL QUIZ	3.20
POW GAMES COLL	3.20
POSITION	2.59
STRATO BOMBER	2.59
3D-BOMB ALLEY	2.59
BLITZKRIEG	2.59
KAMIKAZE	2.59
FORTH	2.15

ATARI400/800XL	£
BLUE MAX 2001	6.79
COUNBTER (DISC)	6.79
ATTACK (DISC)	6.79
AIR RAID (DISC)	6.79
ZAXXON	5.99
BLUE MAX (DISC)	5.99
ARROW OF DEATH	2.59
GOLDEN BATON	2.59
TIME MACHINE	2.59
FIGHTER PILOT	2.15
BUG OFF	2.15
GOLF	2.15
DANGER RANGER	2.15

ATARI 2600	£
SUP BREAKOUT	4.99
BESERK	4.99
COMBAT	4.99
STAR RAIDER	4.99
COSMIC ARC	4.99
SOLAR FOX	4.99
VENTURE	4.99
WARLORDS	4.29
BREAKOUT	4.29
GHOST MANOR/SPIKES PEAK (2 TAPES)	3.39

DRAGON	£
SOURCERERS APP TICE	7.99
ASTERIX	7.99
PIGS IN SPACE	7.99
OBELIX	7.99
KANGEROO	7.99
MARIO BROTHERS	7.99

BOOKS	
PUT YOUR COMM TO WORK	4.95
ACADE GAMES FOR COMM	3.95
50 GAMES FOR VIC 20	6.95
ARCADE GAMES BBC	4.95
DYNAMIC GAMES ELECTRON	4.95
WORKING ELECTRON	6.95
ELECTRONC ARCADES	3.95
ELECTRON MASTER	5.95
ELECTRON 21 GAMES	5.95
GAMES FOR AMSTRAD	4.95
GAMES FOR ATARI	5.95
BOOKS FOR SPECTRUM	QL
WORD PROCESSING	6.95
DATABASE	6.95
MACHINE CODING	6.95
SINCLAIR ADVENTS	6.95

All one price £2.50 inc p&p

SPECIAL** AMSTRAD DISCS – BATMAN, V, MOVIE GREEN BERET, £10.25 EACH
SPECIAL* US – GOLD – COMM 64 – COMBAT LEADER £3.39

PLEASE MAKE CHEQUES AND PO's PAYABLE TO

MSX ** *KONAMI* KNIGHTMARE 12.99

FACULTY ENTERPRISES LTD
29 Rutland Court, Ponders End
Enfield, Middx EN3 4BJ 01-805 8054

MSX * *KONAMI* BILLIARDS (POOL) 12.99

MSX Send for list and prices

27PD500

The Trilogy completed

Tony Kendle with the last Knight Tyme story

Well deserved acclaim is being received by the new David Jones budget masterpiece *Knight Tyme* which has appeared first for the 128K Spectrum. For those who really don't know, *Knight Tyme* is the third in a Mastertronic series that began with *Finders Keepers* and *Spellbound*.

Each of the games were extraordinary value when released (very cheap yet of comparable quality to full price games), but they have all been eclipsed by the latest which is being made available for the current range of 128K machines, using the extra memory, at the amazing price of £2.00. The graphics are of excellent quality, the popular Windowmation menu system has been retained but there are more rooms and more devious puzzles. A slimmed down version of the game will be out for most 48-64K computers as well.

In his last letter to the column David promised us some tips on *Knight Tyme* after the game had hit the shops but before we get on with them, David has the good news that the game should be available for the Amstrad CPC range and MSX by the time you read this – also *Spellbound* is being converted for MSX and Atari.

He also writes "since reading the comments of Eric Ellis about the similarity between the *Spellbound* puzzles and Agatha Christie books I have taken to reading them rather than my usual literary diet of SF and more SF. Agatha Christie has given me a few interesting ideas for future games." Eric Ellis, what have you done? Future games players of the world may curse you for putting new ideas into an already fiendish head. Anyway, let's get on.

"I have not overdone the clues because the game is so new – but I will send more later if anyone needs more help.

"Before you can use the Transporter you must mend it, you must also have some valid Transporter Coordinates to enter into it and be standing on the Transporter Pad.

"To fix the Transporter you move the Starship to Starbase 1 (via Polaris) and Communicate to Request Overhaul Starship. The Transporter will be fixed by the Overhaul Crew. In the 48K version request Gordon to help and he will reroute the control circuits under the guidance of the Overhaul Transporter on Starbase 1.

"If you then request help using the Communicate command when at Starbase 1 you will see some Transporter Coordinates to use. Note that you can't beam down to every planet you come across and that you can only beam down to the one you are orbiting at the time due to the distance limitations of the Transporter Beam. Also, the Advert is useful in the game."

David continues, "Take care not to run out of fuel. Certain planetary locations will supply you with a full tank, others may still be waiting for their fuel delivery and others may just not want you to help them anyway.

"For working out your planetary destinations you will need to construct a map of the game. The following start will apply to the 128K version only. The planets are laid out on an 8 × 8 grid. Not all of the 64 locations have planets in them and you can only move to stars that are 'next door' to the one that you are at.

"To start the mapping here are the positions of some of the stars that you start near. It is useful to move to Starbase 1 fairly early in the game. Some other useful destinations include Reef, Herschell, Bingo, Plinkit, Monopole and Outpost.

Deneb	Gath	Lengraad
•	•	•
Limbo	Eden	Empty
•	•	•
Brightstar	Polaris	Starbase 1
•	•	•
Hestia	Empty	Empty

"Deneb is the star in the top left hand corner of the entire map."

That's all of the tips but there is one more important thing. Regular readers will remember the challenge set for hackers of *Finders Keepers*. David had a special cheat routine that could be set into operation using a secret poke. Well a similar system has been implemented on *Knight Tyme* that will give you access to any room or any planet. This routine can be accessed by poking a single byte somewhere in the game but we're not going to tell you what it is as it is going to form the basis of a competition for hackers.

The first three people who send in the correct poke, which is the same in both the 48 and 128K version, will win a special Magic Knight T-Shirt which David has had printed, so if you think you have cracked it remember to say in the letter whether you are small, medium or large.

A change of subject now to look at another excellent follow up. Alien Highway from Vortex. Andy Woods of Andover writes to say that he has completed it without pokes.

"In case there are any non-believers you push the Terratron through four pillars and it goes under computer control. Then it moves forward to a little square and the Vortron and Terratron join up to form a sort of wheelless tank. This moves forward to a large complex and fires a couple of rounds – the screen goes white, makes a noise and you are left looking at the base upon which the complex stood. Then comes a completion message and a warning that next time it will be harder (big wow!!)."

Andy has some tips for the game – but first, for some strange reason he insists on publicly declaring his everlasting passion for a certain young lady.

To save them both considerable personal embarrassment and due to the fact that, most likely, this would be an episode that both parties would regret in years to come, Tracey Sutherley will have to remain anonymous. Sorry about that, Andy.

Anyway, "it is best to move up the left hand side of the highway. Leave the Terratron near the start, solve about 10 screens of puzzles and kill all aliens, then return for it. Before entering a screen always fire a few shots.

If behind the Terratron you can turn 45 degrees outwards and fire so no kamikaze aliens will get you. To get through the two calor-gas symbol-type pillars line up the vertical line on the vortex with the line that runs through the pillars – and that's it!" Indeed it is.

Graphic Amstrad Adventures

Tony Kendle creates with the Quill

Amstrad adventure-writers have had the benefit of Incentive's *Graphic Adventure Creator* for some while now, and one or two programs are beginning to filter through from this source. They are of varying quality, as regular readers will now know, but I'm sure that what is, at the moment, a trickle, will eventually become a *Quill*-like torrent.

Incentive's new series, *Medallion Adventures*, will feature GAC'd programs, and they would be very interested in seeing *your* creation with a view to publishing it (and Incentive's marketing power means that your adventure is going to be seen by a lot of people). In the Spectrum field, Gilsoft's *Quill* has held a monopoly for adventure-writing utilities, a monopoly that is challenged by Incentive. The Spectrum version of *GAC* is now released, and I am sure that it will prove a viable alternative to *The Quill*.

The new version is much the same as the Amstrad program, with the addition of, in the graphic mode, screen co-ordinates to help you find your way around. I haven't got room here to go into great detail about the utility, and you can refer back to Popular, Volume 4, No 51 (the Christmas '85 issue) for a close look at *GAC*. All the comments I made then hold true for the Spectrum release. Suffice to say that you'll probably find the utility easier, friendlier to use than *The Quill*, though possibly rather more limiting in terms of layout and so on.

The graphics-creating section of the program is capable of great results, and with a certain amount of fore thought, some stunning games are possible. However, as we've found with *The Quill*, the utility must be used with care in order to avoid that conveyor belt, mass-produced look; the vast majority of *Quill*'d adventures show a sad lack of imagination. After all, these utilities make it an easy task to write any adventure, but not necessarily a *good* one.

Since the first appearance of the basic *Quill*, two extensions of the program have been released – *The Illustrator*, adding the facility for graphic illustrations to the plain text, and *The Patch*, which added certain much-needed embellishments, such as sound-effects and RAMsave. Phil Wade is the author of *The Patch* and writes to say: "Many of *The Patch*'s features were inspired by comments in your articles; certainly the RAMsave facility was a direct result of your comment that very few adventures seemed to offer this facility. I'm not a professional programmer, and I'm not a whizz-kid either, having reached the incredible age of 38 (so young, so young!). I must be one of the minority of readers who can understand what *Beatle Quest* (Patch'd) is all about!

"I've just finished *The Expander*, which is for text-only Quill'd adventures. It allows the writer to use the 7K+ bytes otherwise "wasted", which represents a 25% increase in space. The utility will not go on sale though until I've finished two other programs to go with it, one of which is the opposite of *The Expander* (geddit?) and will be used with Patch'd programs." *The Patch* has probably been responsible for a renewal of interest in *The Quill*, and any update in the utility must be a good thing. More news as it arrives.

"The Quill requires plenty of imagination"

Gerald Kellet has also authored an add-on to *The Quill* (the C series), which adds five extra actions to the utility: "*PARSE* extends input interpretation, up to 15 words at a time from a single line of input, *WAIT* effects a passage of time by cycling through the Status table and Turn flags update, *ADD* and *SUB* work on two flags instead of a flag and a fixed value, and *PERFORM* calls entries in the Event table as if they had been input by the player – this is primarily for 'forced syndromes'/ 'Event equivalents', and also for loops, shared routines, ORed and XORed logic, I am at present endeavouring to get this published." If you want to know more about this interesting looking add-on, contact Gerald at 28 Queen's Street, Stamford, Lincs PE9 1QS.

But, as regular readers of The Corner will be aware, there are several other adventure-writing utilities available for the Spectrum apart from *The Quill*, most of which have been seen in this Corner; joining these now is *The Spectrum Adventure Builder System* from Tartan Software. Tom Frost is the author of this utility, and his name should be familiar as the Adventurer of 1985, a title bestowed upon him by Incentive Software for being the first to solve the Ket Trilogy. As the creator of a couple of adventures, Tom has decided to pass along his expertise to us lazier mortals in the form of this adventure-writing utility. Where *The Quill* hands everything to the user, requiring only (!) plenty of imagination and lots of pre-planning, Tom's SABS demands some programming expertise of the writer. Not a lot, but as a reward the program is very flexible (and stunning value, I might add).

Essentially, some Basic in the form of short loaders must be written, but all the hard work of Data statements and variables is taken care of by SABS. On-screen prompts ask for the number of verbs and the maximum length, how many objects and the maximum length of their names, number locations, number of objects carried and so on and so on. The standard responses such as *"Here you can see"* and other system messages can be changed at will, as can the screen layout and colours.

The Code Generator program then assembles all the data; another module passes the finished dataset to the machine-code which will run the adventure. This is what makes the utility very interesting – as you can see from the game that Tom has written using SABS, responses are as quick as with Quill'd adventures. *Spy Trilogy* is a three-parter displaying all the features available to users of SABS, such as RAMsave, split-screen scrolling and so on. The Trilogy is worth looking at on its own merits, with the first two parts being a beginner's introduction to the final, more difficult part.

Graphics play a part in this game, and Tartan Software offer a *Graphics Aid* module, which will allow the user to build up a re-designed character set to use in pictures. This, together with the main utility, is all the adventure-writer needs to write professional-looking programs which should stand up to Quill'd games. And the suite of programs is great value of £4.50 for the main SABS module, £2.95 for the graphics module (you'll only be able to use it with SABS), and these are available together at £6.50.

Spy Trilogy, which I'd recommend as an excellent example of the utility's power, and as a great adventure, is just £2.50: these prices represent fantastic value. All available mail order from Tartan Software 61 Bailie Norrie Crescent Montrose Angus Scotland DD10 9DT or from the software catalogue of The Adventurer's Club Ltd.

MICRO MAIL

53 FENNEL STREET
MANCHESTER M4 3DU
TEL: 061 834 5780

AMSTRAD

	RRP	OUR PRICE
CPC 6128 – Colour	£399	£379
CPC 6128 – Green	£299	£284
PCW 8256	£459	£439
PCW 8512	£574	£549
RS 232 for 464/664/6128	£49.95	£44.95
RS 232 for PCW 8256/8512	£69.95	£59.95
DMP 2000	£159.95	£149.95
SSA1 Speech Synthesiser	£29.95	£26.95
MP2 – Modulator	£29.95	£26.95
JY2 – Joystick	£14.50	£12.50
Modem –	£136.85	£126.00
PCW 8256 Modem & Sage Software	£189.95	£172.00
	each	Box of 10
CF2 3" Discs	£3.99	£37.50
	each	Box of 10
CF200 3" Discs	£5.99	£55.00
FDI – 2nd Disc Drive	£89.95	£84.95
DDI – Disc Drive	£159.95	£149.95

AMSTRAD CPC6128/PCW 8256/ PCW 8512 SOFTWARE

Personal Assistant	£94.95	Touch 'n' Go	£24.95
Pocket Wordstar	£99.95	Mastercalc 128	£34.95
(please state whether for 6128 or 8256)		Pyradev	£29.95
Flexifile/Flexiwrite	£49.95	Protext	£26.95
Supercalc 2	£49.95	Promerge	£24.95
3D Clock Chess	£19.95	Prospell	£24.95

SHOWROOM NOW OPEN

ALL LESS 10% DISCOUNT

SAGESOFT	
Pop. Accounts	£99.99
Pop. Accounts/ Payroll	£149.95
Pop. Accounts Plus	£149.95
Payroll	£69.95
Invoicing/Stock Control	£69.95
Database	£69.95
Chit Chat E. Mail	£69.95
Chit Chat Viewdata	£69.95
Magic Filer	£69.95
Retrieve	£69.95
Accounts Super Combo	£199.95
HISOFT	
Pascal 80	£39.95
Devpac 80	£39.95
"C"	£39.95
Keyboard Tutor	£24.95
Pocket Cash Trader	£99.95
Masterfile II	£33.00
Microfile/ Microword	£49.95
Bridge Player	£19.95
Hitch Hikers' Guide to the galaxy	£28.95

CAMSOFT	
Stock Control	£49.95
Payroll	£49.95
Invoicing	£49.95
Database	£49.95
PSIS Stock, Inv. & Sales	£99.95
PSIL Stock, Inv., Sales, Pur, Nom.	£149.95
CAXTON	
Cardbox	£99.99
Scratchpad Plus	£69.95
Brainstorm	£49.95
Touch 'N' Go	£24.95
Smartkey	£49.95
DIGITAL RESEARCH	
DR Draw	£49.95
DR Graph	£49.95
Basic Compiler	£49.95
Pascal MT +	£49.95
Printer Extension Cable 8256/8512	£12.95
Covers 8256/8512 set	£12.95
6128 set	£12.95
464 set	£12.95
256K Expansion kit for 82556	£49.95

ALL DISC GAMES LESS 10% OFF RRP.
JUST SEND YOUR CHEQUE OR P.O. WITH A NOTE STATING WHICH TITLE YOU WANT.

Post and Packing: ***FREE.*** ALL Computers ADD £6 for value UNDER £250
All payments cheque or P.O. to: I M PRIESTLY
ALL PRICES INCLUSIVE OF VAT

C & F ASSOCIATES

BBC CASSETTE	RRP	Our Price
COMMANDO	9.95	7.50
COSMIC BATTLEZONES	9.95	7.50
MOON CRESTA	7.95	6.50
AIRWOLF	9.95	7.50
BRUCE LEE	9.95	7.50
WINTER OLYMPICS	7.95	6.50
EXPLODING FIST	9.95	7.50
YIE AR KUNG FU	9.95	7.50
STEVE DAVIS SNOOKER	8.95	6.95
PRICE OF MAGIK	9.95	7.50
DEATH STAR	9.95	7.50
SPEECH	9.95	7.50
CITADEL	9.95	7.50
REPTON 2	9.95	7.50
SOUTHERN BELLE	7.95	6.50
COMPUTER HITS (10) 2	9.95	7.50
JUMP JET	9.95	7.50
BBC DISC		
BRUCE LEE	14.95	12.95
MINI OFFICE 2	16.95	14.95
ENTHAR 7	16.95	14.95
RICK HANSON	11.95	10.45
PROJECT THESIUS	11.95	10.45
HYPER SPORTS	12.95	10.95
YIE AR KUNG FU	12.95	10.95
EXPLODING FIST	14.95	12.95
OLYMPIC DECATHLON	9.95	7.50

	RRP	Our Price
OLYMPIC DECATHLON	9.95	7.50
LORD OF THE RINGS	19.95	16.50
SPEECH	11.95	10.45
CITADEL	11.95	10.45
STRIKE FORCE HARRIER	12.95	10.95
KARATE COMBAT	11.95	10.95
STEVE DAVIS SNOOKER	12.95	10.95
THE HOBBIT	17.95	15.95
MOON CRESTA	9.95	7.50
ELECTRON		
COMMANDO	9.95	7.50
CITADEL	9.95	7.50
YIE AR KUNG FU	8.95	6.95
THAI BOXING	5.95	5.50
WINTER OLYMPICS	7.95	6.50
COMPUTER HITS (10) 2	9.95	7.50
SOUTHERN BELLE	7.95	6.50
JUMP JET	9.95	7.50
BUG EYES 2	7.95	6.50
KARATE COMBAT	8.95	6.95
EXPLODING FIST	9.95	7.50
THE QUILL	16.95	14.95
JET SET WILLY	7.95	6.50
CAVEMAN CAPERS	7.95	6.50
GALACTIC COMMANDER	7.95	2.95
FLIGHT PATH 737	5.95	4.95
FOOTBALL MANAGER	8.95	6.95

ALL PRICES INCLUDE VAT AND POSTAGE & PACKING (Overseas Orders add £1.00 per item)
CHEQUES/PO PAYABLE TO: C & F ASSOCIATES AND SEND TO
C & F ASSOCIATES (PCW), PO BOX 2, BIDEFORD EX39 3RE
Telephone: (023 73) 619
26PD907

MEGASTREAM LIMITED

Dept. PCW, 1st Floor, Commerce House,146/150 Commercial Street, London E1 6NU
WE GUARANTEE BEST TITLES AT DISCOUNT PRICES

AMSTRAD	RRP £	Our Price £
BET DEXTER	9.95	£8.90
SPINDIZZY	9.95	6.90
BATMAN	8.99	6.50
TOMAHAWK	9.95	6.90
COMMANDO	9.95	6.90
FRL 13th	8.95	6.50
SUPERSLEUTH	8.95	6.90
WORLD CUP		
CARNIVAL	9.95	6.90
SHOGUN	9.95	6.90
CHUCKIE EGG II	7.95	5.90
BEACH HEAD	9.95	6.90
RAID	9.95	6.90
GHOSTBUSTER	10.95	7.90
HACKER	9.99	6.90
BALL BLAZER	9.95	6.90
FOOTBALL MANAGER	7.95	5.90
WIND DANES WING II	8.99	6.50
JUMPJET	9.95	6.90
SLAPSHOT	9.95	6.90
WORLD CUP	7.95	5.90
CPUTOR HITS 10 (Vol 2)	9.95	6.90

AMSTRAD	RRP £	Our Price £
REMBRANDT	13.95	10.90
ULTRA BASE	14.95	11.90
SPY V SPY	9.95	6.90
WIZARDS LAIR	8.95	6.50
ARNHEM	9.95	6.90
STEVE DAVIS' SNOOKER	7.95	5.90
COLOSSUS CHESS 4	9.95	6.90
SNOOKER	8.95	6.50
BRUCE LEE	9.95	6.90
ZORRO	9.95	6.90
WEST BANK	8.95	6.50
ELITE	14.95	11.90
COMMODORE 64		
THRUST	1.99	1.99
INT. KARATE	6.50	4.90
FORM ONE SUM	1.99	1.99
SPELLBOUND	2.99	2.90
V	8.95	6.50
AIRWOLF	7.95	5.90
WORLD CUP		
CARNIVAL	9.95	6.90
SPINDIZZY	9.95	6.90

COMMODORE	RRP £	Price £
BREAKDANCE	2.99	2.90
PSI 5 TRADING COMPANY	9.95	6.90
HACKER	9.99	6.90
BACK TO THE FUTURE	9.95	6.90
BALL BLAZER	9.95	6.90
QUAKE - 1	9.95	6.90
BLADE RUNNER	8.95	6.50
Ghosts & Goblins (C'g s'w)	7.95	5.90
HEAVY ON THE MAGICK	9.95	6.90
THEY SOLD A MILLION II	9.95	6.90
SUPER ZAXXON	9.95	6.90
URIDIAM	8.95	6.50
ELITE	14.95	11.90
MUSSY'S REVENGE	8.95	6.50
BBC		
COMMANDO	9.95	£8.90
WINTER		
OLYMPICS	7.50	5.90
BRUCE LEE	9.95	6.90
TENNIS	2.99	2.90
COSMIC BATTLE ZONE	9.95	6.90
YIE R KUNG FU	9.95	6.90

WE ENSURE A FAST AND EFFICIENT SERVICE
Postage & packing included. Overseas orders add 75p per title. Mail order only. Cheques or postal orders (sterling only). Made payable to
Megastream Limited
Dept. PCW. 1st Floor, Commerce House, 146/150 Commercial Street, London E1 6NU
27PD800

Future programming for your micro

John Mawhood explains micro-Prolog

So often you hear people say that they bought their micro only to find that, when it comes to programming, the languages available for their machine do not really offer any useful scope. This may be because the language is difficult to produce good programs in quickly or because the version of the language they have is limited.

Anyone who owns one of the range of micros which run CP/M 2.2 or CP/M Plus software really can begin to use professional quality languages from the word go. At the moment a lot of this is only available at a hefty price – sometimes costing as much as the computer itself. But not all! micro-Prolog, although not exactly cheap, compares well with the price of packages for Pascal or C.

If you own a Spectrum or BBC machine you can get, for even less, "native" versions of micro-Prolog, which can produce graphics as well as having most of the features of standard microProlog.

Prolog was developed on mainframes and is the language the Japanese have adopted for their "fifth generation" computer project, aimed at the development of artificial intelligence and other wonders. Micro-Prolog is the version of the language for micros.

Every computer "buff" has their favourite language. Generally you will find it's a question of horses for courses – to get stunning graphics you would not usually choose BASIC. (Before hardened BASIC games authors write in: I am not saying you *cannot* do it) But surely, if Prolog is being used to develop so-called artificial intelligence, it must be a pretty powerful language? Perhaps a language you could benefit from trying out?

A word of warning: once you have used micro-Prolog you may never be able to go back to your old language. If you have only used BASIC or PASCAL, at first you will find micro-Prolog a bit strange. This is because it is a *declarative* language not *iterative*.

I do not have space here to explain the reasons but it is generally accepted that "structured" languages which can be programmed top-down are most useful, and produce better programs (and programmers). Structured languages help to prevent "spaghetti" programs – where you cannot see how it all works. Another limitation with languages is the way in which information (called "data") is stored.

Micro-Prolog gives the programmer perhaps the most structured language one could hope to have on a micro today as well as the most flexibility with data, because data and programs are all the same thing in micro-Prolog. More than this, it offers "metalogical" programming features available with few other languages. Metalogical programming involves writing programs that manipulate other programs or even themselves.

The power of micro-Prolog lies in the logical way it works – Prolog stands for PROgramming in LOGic. It is possible to create programs *at the keyboard*. You can start by writing a description of the whole problem you want to solve and then write the descriptions of all the stages which make up the problem working from the top down (true top-down programming). With other languages you have to do all that on paper first and then actually write the program from the bottom up. But in micro-Prolog it is possible to run a half-written program. When it comes to a part that is not written you have, if you use the trace facility that comes with micro-Prolog, the option of writing it *and carrying on where it stopped* – PASCAL or BASIC would treat that as an error.

```
((apply_user_defined_operation_
first_list_second_list_result_list)
   (empyt_list_first_list)
   (empyt_list_second_list)
((apply_user_defined_operation_
first_list_second_list_result_list)
   (split_first_list_head_of_first_
   rest_of_first)
   (split_first_list_head_of_first_
   rest_of_second)
   (split_first_list_        head_of_
   first_rest_of_second_result)
   (put_on_end_result_result_
   list_new_result_list)
   (apply_user_defined_opera-
   tion_rest_of_first_rest_of_
   second_new_result_list))
```

The micro-Prolog in the box is the only program you would *ever* need to apply *any two-argument operation* to two lists. Which could be lists of numbers or other constants (and that includes operations you have defined yourself, not just mathematical or boolean ones). This is possible because of the metalogical feature. In BASIC or PASCAL you could copy the routine each time and put in the operator you wanted, but it could not be used with a user-defined operation.

A micro-Prolog program is a list of words enclosed in brackets. The structure of each "list" is as shown below, with square brackets indicting optional parts and underlining indicating parts you cannot leave out:

> ((*program name first parameter* [any number of following parameters]) [any number of calls to sub-programs by name followed by the appropriate number of parameters – each call enclosed in brackets])

How does micro-Prolog execute these programs? Think of the program as describing the layout of a cluster of "rooms" in an adventure game. Remember that each cluster of rooms can have corridors (i.e. make a call to) other clusters. Micro-Prolog is the adventurer and the goal is to reach the end of the "list".

The "parameters" which you give micro-Prolog when you start it are like keys or tokens, which it uses to pass through the rooms. It can find more keys of tokens as it works its way along. With the right keys, micro-Prolog will eventually work its way through all the rooms in the cluster reach the goal.

Some rooms contain tasks for micro-Prolog to perform before it can pass on to the next room. Some may e a corridor to another cluster. Micro-Prolog has to go down any corridor it comes to and work through the rooms at the end because

Special Prolog Discount

Would you like to get into the world of programming in Micro Prolog? Well, *Popular Computing Weekly*, together with Logic Programming Associates, have made it that little bit easier for you.

During the month of July, if you order any Prolog or Micro-Prolog package from LPA using this coupon – you get 10% off the normal price – **and that's a saving of up to £45!**

Just fill in the details below and send the coupon direct to LPA with your order – it's the only logical thing to do.

☐ I claim my *Popular Computing Weekly* 10% Discount

Name .....

Address .....

.....

Send orders direct to Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity, London SW18 3SX. Offer ends 31 July 1986.

there may be tokens in them it needs to achieve its goal. Once all the rooms at the end of a corridor have been "done" micro-Prolog goes back and carries on in the main program.

If micro-Prolog fails to perform a task in any room it has to backtrack to see if there were any alternative tokens it could have picked up earlier. This can happen if you have written two or more versions of the same sub-program. Micro-Prolog has to try them one at a time until it finds the right tokens to enable it to perform the task it had failed on.

Ultimately if a task cannot be performed after micro-Prolog has tried all the alternative sub-programs then it gives up altogether. It shows its frustration (and tells you it has failed) by printing "?" on the screen.

You may think that this is a far cry from BASIC where the computer executes one numbered line of instructions followed by the next, unless your program tells it to do something else. What it means is that micro-Prolog does all the work jumping about between the various parts of your program. Nowhere in micro-Prolog can you GoTO another part of the program – as if it broke through the wall of a room – that would be cheating. The advantage is that anyone else can work out what the program does – because all the execution follows the logic of micro-Prolog. It is impossible to write "spaghetti" programs in micro-Prolog. As a result you concentrate on solving the problem. It is not surprising to find that commercial software written using Prolog can be half as long and written in a fraction of the time that it would take a conventional language.

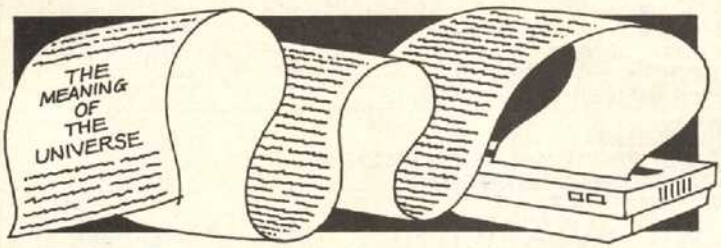
So how does our example program work? Let us say we have two lists (1 2) and (3 4), and we want to add the pairs of numbers together to make a third result list. (Remember micro-Prolog stores data as lists just as it does programs). So in our example "__user__defined__operation" will be a + sign and "__first__list" will be (1 2) and "__second__list" (3 4).

Micro-Prolog will start with the first program for "apply". As it fails to perform the task (empty__list (1 2)) – because (1 2) is not an empty list – it goes back to see if there is an alternatie program for "apply", which there is. Using the alternative program micro-Prolog finds it has to take the first element of each list and execute or "apply" (hence the name I used) the operation you have given it, + , to them – holding onto the result. Addition happens to be a built-in program in micro-Prolog but we could have used a user-defined operation. The result is put on the end of the result list.

But I bet you could have read the example and almost guessed that – even not knowing micro-Prolog! The last part of the program seems funny; it looks like we are using "apply" is a recursive program, which means it calls itself. It is a very neat way of getting micro-Prolog to keep doing the same thing over and over again as it moves down a list.

You will have noticed that when micro-Prolog comes to "apply" at the end of the second program, we have only given it the part of the lists that has not been added yet – and the list of results so far. Every time round micro-Prolog tries the first program for "apply". Eventually it will find that the first and second lists have no more elements left – the first program ends if that is the case and micro-Prolog succeeds. In this explanation we used a simple operation – addition. But "apply" would work with a program for use by a doctor to tell whether two drugs in combination were harmful for a patient.

If you found all that a bit technical do not be put off; I had to use an example that would show the power of micro-Prolog.



Fortunately beginners in micro-Prolog are extremely well catered for. There are no less than three simplified forms of micro-Prolog that comes on the disc. The easiest to use is MITSI (Man In The Street Interface), the second, SIMPLE, accepts programs in almost-English (SIMPLE is in itself as powerful a relational database language as you could buy) and MICRO is a comprehensive software development tool. To make life even easier you get special programs which let you trace your programs as closely as you like (I used these constantly), and another allows you to use your disc drive as part of your program while it is running – useful because micro—Prolog tends to devour memory.

To complement this there are some excellent books which will take you from knowing nothing to a good understanding of micro-Prolog. See the table.

Conclusion

Micro-Prolog is now available on under MSDOS CP/M86 and UNIX operating systems so if you want upward "portability" it is there. Unlike PASCAL, micro-Prolog is an interpreted language which means you can write parts of a program and run them straight away – as you do in BASIC. This, along with the tracing and debugging programs you get makes it easier to use, in my view, than BASIC. There is a compiler for the 16 bit version if you think you will need to get professional when the new "cheap" 16 bit machines comes onto the market.

If you are looking for a language that is going to help you become familiar with the kind of programming that will be widespread by 1990, have a close look at micro-Prolog, it is excellent value for money. Although it is not very good for graphics, it is good for your programming.

Micro-Prolog Buyers Guide

Program Micro-Prolog **Micro** Amstrad CP/M **Price** £69.50 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London SW18 3SX.

Program Micro-Prolog **Micro** Apple II/Apple IIe **Price** £85 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London.

Program Micro-Prolog **Micro** BBC B **Price** £79.95 (on Rom) **Supplier** Acornsoft, Betjeman House, 104 Hills Rd, Cambridge.

Program Micro-Prolog **Micro** Commodore 64 **Price** £69.50 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London SW18 3SX.

Program Micro-Prolog **Micro** Any CP/M 80 System **Price** £95 + VAT (incl Manual + Tutorial) **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London.

Program Micro-Prolog 3,1 **Micro** IBM PC **Price** £195 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London.

Program Prolog Professional **Micro** IBM PC **Price** £245 + VAT (Interpreter only) £485 + VAT (includes Compiler) **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London SW18 3SX.

Program MacProlog **Micro** Apple Macintosh **Price** £395 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London SW18 3SX.

Program Micro-Prolog **Micro** Spectrum **Price** £24.95 **Supplier** Sinclair Research, Milton Hall, Cambridge.

DODGEM WITCHES

by Derrick Reid

Can you face up to the task? You must steer your spaceship clear of the manic witches that fly in mad confusion through the sky.

This principal purpose of this routine however, is not to provide a simple game but to provide the programmer with a machine code sprite movement utility enabling all eight sprites to be moved around the screen with ease. I have placed the routine at the end of the listing to make the task of incorporating it into your own programs easier.

The routine forms lines 60000 onwards and should be initialised by *Gosub 60000* after all the data for the Basic program has been read in.

Sprite movement is controlled by one *Sys* command:-

Sys 49152,No,XV,YV,XD,YD

where *No* = number of sprite (0 to 7)
XV = horizontal velocity (0 to 255)
YV = vertical velocity (0 to 255).
XD = vertical displacement (-128 to 127).
YD = vertical displacement (-128 to 127).

In the sample game a joystick in port 2 controls your spaceship.

```
1 REM*****************************
2 REM*          DODGEM           *
3 REM*  (WITH SPRITE UTILITY)    *
4 REM*  BY DERRICK REID          *
5 REM*****************************
10 FORI=0TO127:READD:POKE12288+I,D:NEXT
20 V=53248:FORI=0TO7:READD:POKEV+39+I,D:NEXT
30 M=54272:POKEM+4,16:POKEM+5,0:POKEM+6,240:POKEM,12
40 GOSUB60000
50 PRINT"■":POKE53280,0:POKE53281,0
60 FORI=0TO49:P=INT(RND(0)*800):POKE1024+P,46:POKE55296+P,1:NEXT
70 PRINT"■■■
```

```
6000 DATA0,168,0,0,168,0,10,170,128,10,170,128,42,170,160,42,170,160,85,85,84
6010 DATA68,68,68,85,85,84,42,170,160,42,170,160,10,170,128,10,170,128
6020 DATA0,168,0,0,168,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
7000 DATA5,6,1,10,13,4,7,14
60000 FORI=49152TO49361:READA:POKEI,A:NEXT
60010 SYS49254 60020 RETURN
60999 REM*** SPRITE UTILITY DATA ***
61000 DATA32,253,174,32,158,183
61010 DATA224,8,144,3,76,8,175
61020 DATA138,10,133,253
61030 DATA32,253,174,32,158,183
61040 DATA164,253,138,153,167,2,153,183,2
61050 DATA230,253,32,253,174,32,158,183
61060 DATA164,253,138,153,167,2,153,183,2
61070 DATA198,253,164,253,200,200,132,254
61080 DATA32,253,174,32,138,173,32,170,177
61090 DATA201,255,240,7,152,201,128,176,24
61100 DATA144,7,192,128,144,18
61110 DATA152,73,127,166,253,157,199,2
61120 DATA166,253,232,134,253,228,254,208,215,96
61130 DATA76,8,175
62000 DATA120,169,125,141,20,3,169,192,141,21,3,88,169,0,162,47,157,167,2
63000 DATA202,16,250,96,162,15,169,128,133,252
63010 DATA133,251,189,167,2,240,56
63020 DATA222,183,2,208,51
63030 DATA189,167,2,157,183,2
63040 DATA189,199,2,16,19
63050 DATA41,127,133,2,230,2
63060 DATA189,0,208,56,229,2
63070 DATA157,0,208,144,11,176,21
63080 DATA24,125,0,208,157,0,208
63090 DATA144,12,165,251,208,8,165,252
63100 DATA77,16,208,141,16,208
63110 DATA165,251,208,2,70,252,73,128,133,251 63120 DATA202,16,182,76,49,234
```

SIMULTANEOUS EQUATIONS

by F R Richardson

This program, for the QL, will solve just about any set of linear simultaneous equations, whether there are just two unknowns or whether there are 50 or more. Furthermore, the equations are keyed into the computer in exactly the same way as you would write them down on paper, eg, if one of the equations was X+3Y-Z=4, then that is what you would type in – the program understands that you mean '1' times 'X'. Another bonus is that you can any alphabetic symbols you wish, upper or lower case, to represent the unknowns.

I have tried to make the program as easy to use as possible and perhaps the easiest way to explain it is by example. Suppose you wanted to solve the following set of equations:-

5a + 3b = 3c = 48
2a + 6b-3c = 18
8a-3b + 2c = 21

After loading the program and running it, you would be asked *'How Many Unknowns?'*. There are three of course, a, b, and c, so you type '3' *(Enter)*. Then the computer will ask you to type in equation one and you oblige by typing in the top equation exactly as it is written above. Similarly, you type in the other equations when prompted. After a few seconds, if you have typed in the program correctly, you will be informed that the answers are a=3, b=5, and c=6. Easy!

Here are a few notes of extra guidance. Firstly, you should always put the 'unknowns' on the left-hand-side of the equations (quite usual anyway). Secondly, the number of equations must equal the number of unknowns. Finally, it is not always possible to solve a set of linear equations, no matter what method you use. In this instance, the computer will inform you that no solution is possible.

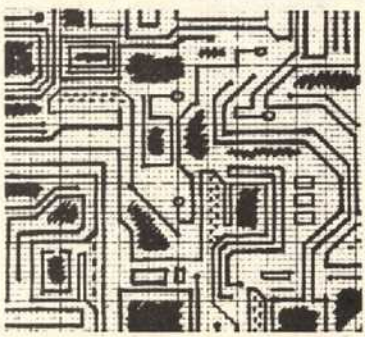
For those who are intent on unravelling the mysteries of the program, I should say that I have converted the input data into determinants and used Cramer's Rule to solve the equations. The determinants being held as strings. I should be very interested to learn if anyone has produced a simpler method for achieving the same result.

If you are interested in the program but lack the time or energy to type it in yourself, I should be glad to supply a copy of it. Just send a formatted cartridge and £2 to me at 22 Avon Crescent, Alcester, Wark B49 6BJ.

Programming: QL

```
110 REMark BY F.R. RICHARDSON
120 CLS
125 REMark INPUT DETAILS OF EQUATIONS
130 INPUT "HOW MANY UNKNOWNS ? ";unknowns
140 DIM nos(unknowns,unknowns+1),line$(unknowns,
6*unknowns^2),variable$(unknowns,1)
150 FOR equ=1 TO unknowns
160   PRINT "TYPE IN EQUATION NO.";equ;" : ";
170   INPUT equ$
180   IF equ=1 THEN note_variables equ$,variable$
190   get_data equ$,unknowns,equ
200 END FOR equ
205 REMark MAKE DETERMINANTS AND PUT INTO STRINGS
210 FOR m=0 TO unknowns
220   FOR n=1 TO unknowns
230     FOR p=1 TO unknowns
240       IF p=m THEN
250         line$(m)=line$(m)&(nos(n,unknowns+1))&","
260       ELSE
270         line$(m)=line$(m)&(nos(n,p))&","
280       END IF
290     END FOR p
300     line$(m)=line$(m)(1 TO LEN(line$(m))-1)&"*"
310   END FOR n
320   line$(m)=line$(m)(1 TO LEN(line$(m))-1)&"?"
330 END FOR m
340 REMark CALCULATE THE VALUES OF EACH DETERMINANT
345 FOR soln=0 TO unknowns
347   a$=line$(soln)
350   nw$=""
360   REPeat expand
370     det_order a$
380     IF order=2 THEN EXIT expand
390     REPeat cutter
400       take_sbstring$ a$
410       rd_to_array order,sb$
420       transform order,nw$,det
430       IF a$="" THEN EXIT cutter
440     END REPeat cutter
450     a$=nw$
460     nw$=""
470   END REPeat expand
480   total=0
490   REPeat totaller
500     take_sbstring$ a$
510     rd_to_array order,sb$
520     total=total+det(1,1)*det(2,2)-det(1,2)*det(2,1)
530     IF a$="" THEN EXIT totaller
540   END REPeat totaller
551   IF total=0 THEN PRINT "NO SOLUTION POSSIBLE":STOP
552   IF soln=0 THEN bottom=total
554   IF soln<>0 THEN PRINT variable$(soln);"
= ";total/bottom
556 END FOR soln
560 STOP
570 DEFine PROCedure det_order (a$)
580   position=1:order=1
590   REPeat no_counter
600     IF a$(position)="*" THEN EXIT no_counter
610     IF a$(position)="," THEN order=order+1
620     position=position+1
630   END REPeat no_counter
640 END DEFine
650 DEFine PROCedure take_sbstring$ (a$)
660   position=1:sb$=""
670   REPeat taker
680     IF a$(position)="?" THEN EXIT taker
690     IF a$(position)="*" THEN
700       sb$=sb$&","
710     ELSE
720       sb$=sb$&a$(position)
730     END IF
740     position=position+1
750   END REPeat taker
760   IF LEN(sb$)=LEN(a$)-1 THEN
770     a$=""
780   ELSE
790     a$=a$(position+1 TO)
800   END IF
810 END DEFine
820 DEFine PROCedure rd_to_array (order,sb$)
830   DIM det(order,order)
840   place=0
850   FOR i=1 TO order
860     FOR j=1 TO order
870       temp$=""
880       REPeat no
890         place=place+1
900         IF place>LEN(sb$) THEN EXIT no
910         IF sb$(place)="," THEN EXIT no
920         temp$=temp$&sb$(place)
930       END REPeat no
940       det(i,j)=temp$
950     NEXT j
960   NEXT i
970 END DEFine
980 DEFine PROCedure transform (order,nw$,det)
990   sign=1
1000  FOR n=1 TO order
1010    FOR p=1 TO order
1020      IF n=p THEN
1030        IF p=order THEN
1040          nw$=nw$(1 TO LEN(nw$)-1)&"*"
1050          EXIT p
1060        ELSE
1070          NEXT p
1080        END IF
1090      END IF
1100      nw$=nw$&(sign*(det(1,n)*det(2,p)))
1110      IF p<order THEN
1120        nw$=nw$&","
1130      ELSE
1140        nw$=nw$&"+"
1150      END IF
1160    END FOR p
1170    FOR r=3 TO order
1180      FOR s=1 TO order
1190        IF s=n THEN
1200          NEXT s
1210        ELSE
1220          nw$=nw$&det(r,s)&","
1230        END IF
1240      END FOR s
1250      nw$=nw$(1 TO LEN(nw$)-1)&"*"
1260    END FOR r
1270    nw$=nw$(1 TO LEN(nw$)-1)&"?"
1280    sign=-sign
1290  END FOR n
1300 END DEFine
2000 DEFine PROCedure note_variables (equ$,variable$)
2010   count=1
2020   FOR n=1 TO LEN(equ$)
2030     IF (equ$(n)>="a" AND equ$(n)<="z") OR (equ$(n)>="A"
AND equ$(n)<="Z") THEN
2040       variable$(count)=equ$(n)
2050       count=count+1
2060     ELSE
2070     END IF
2080   END FOR n
2090 END DEFine
2100 DEFine PROCedure get_data (equ$,unknowns,equ)
2110   IF equ$(1)<>"+" AND equ$(1)<>"-" THEN equ$="+"&equ$
2120   implied_ones equ$
2130   take_nos unknowns,equ$,nos,equ
2140 END DEFine
2150 DEFine PROCedure implied_ones (equ$)
2160   mod$=""
2170   FOR chr=1 TO LEN(equ$)-1
2180     IF (equ$(chr)="+" OR equ$(chr)="-") AND (equ$(chr+1)
         ("0" OR equ$(chr+1)>"9") THEN
2190       mod$=mod$&equ$(chr)&"1"
2200     ELSE
2210       IF equ$(chr)="=" AND (equ$(chr+1)<>"+" AND
           equ$(chr+1)<>"-") THEN
2220         mod$=mod$&equ$(chr)&"+"
2230       ELSE
2240         mod$=mod$&equ$(chr)
2250       END IF
2260     END IF
2270   END FOR chr
2280   equ$=mod$&equ$(LEN(equ$))&"q"
2290 END DEFine
2300 DEFine PROCedure take_nos (unknowns,equ$,nos,equ)
2310   spot=1
2320   FOR n=1 TO unknowns+1
2330     temp$=""
2340     REPeat chopper
2350       IF (equ$(spot)>="a" AND equ$(spot)<="z") OR
           (equ$(spot)>="A" AND equ$(spot)<="Z") THEN
2360         spot=spot+1
2370         EXIT chopper
2380       ELSE
2390         temp$=temp$&equ$(spot)
2400         spot=spot+1
2410       END IF
2420     END REPeat chopper
2430   IF temp$(1)="+" THEN temp$=temp$(2 TO)
2440     nos(equ,n)=temp$
2450   END FOR n
2460 END DEFine
```

Programming: Amstrad



DEBUGGIN' by T A Bartley

This is a grid game where your hero has to neutralise all the magnetic cores in an ancient computer system. However, the logic bombers have other ideas and they try to put the bite on you by sending logic bombs along the data lines.

Every time you complete a screen your score is added to the total so far, followed by a bonus screen which doesn't have to be completed to score points. There are eleven screens, each followed by a bonus screen, making a grand total of 22. Speed is selected from a range of one to five, the faster speeds being worth more points but, of course, making the game harder.

You can use either the cursor keys or a joystick to control your buggy and, during the game, you can pause by pressing 'H'. Restart by pressing the space bar.

Program 1 is the Basic loader for the machine code, when it's finally typed in. Type in the loader and save it under the file name *"Debuggin' "*. Program 2 is the decimal loader for entering the actual machine code and should be typed in and then run.

Now, the data, all 3896 bytes of it, should be carefully entered. However, because of the large amount of data to be entered this being split over two weeks. Use the command Save *"Debugcode",B,31000,2048*.

The checksum for the first block of data is 166943. More next week.

If you can't face the prospect of all that typing then send £2.00 to me at 81 Beverley Crescent, Grimsby, S. Humberside DN32 9TJ.

```
31000  0  16  32   0   0  16  32   0  =  96
31008  0  48  48   0  16  48  48  32  = 240
31016  0  32  16   0  16  32  16  32  = 144
31024 48  32  16  48  32  32  16  16  = 240
31032 32  32  16  16  48  32  16  48  = 240
31040 16  32  16  32   0  32  16   0  = 144
31048 16  48  48  32   0  48  48   0  = 240
31056  0  16  32   0   0  16  32   0  =  96
31064 48   0   0   0  16  32  32   0  = 128
31072 48  48  48   0   0   0  48  48  = 240
31080  0   0  48  48  48  48  48   0  = 240
31088 16  32  32   0  48   0   0   0  = 128
31096  0   0   0  48   0  16  16  32  = 112
31104  0  48  48  48  48  48   0   0  = 240
31112 48  48   0   0   0  48  48  48  = 240
31120  0  16  16  32   0   0   0  48  = 112
31128 168  64 128  84 252 192 192 252  = 1332
31136  84 252 252 168  84 168  84 168  = 1260
31144  0 252 252   0   0 132  72   0  = 708
31152  0  64 128   0   0  64 128   0  = 384
31160  0  64 128   0   0  64 128   0  = 384
31168  0 132  72   0   0 252 252   0  = 708
31176  84 168  84 168  84 252 252 168  = 1260
31184 252 192 192 252 168  64 128  84  = 1332
31192 252   0   0   0  84 252   0   0  = 588
31200  64 252 232   0 192 160 172 192  = 1272
31208 192 168 172 192  64 252 232   0  = 1272
31216  84 252   0   0 252   0   0   0  = 588
31224  0   0   0 252   0   0 252 168  = 672
31232  0 212 252 128 192  92  84 192  = 1152
31240 192  92  84 192   0 212 252 128  = 1152
31248  0   0 252 168   0   0   0 252  = 672
31256  0   3   1   2   0   3   1   2  = 12
31264  0   1   1   0   1   3   3   3  = 12
31272  0   1   3   0   0   1   3   0  = 8
31280  0   1   3   0   0   0   2   0  = 6
31288  0   0   2   0   0   1   3   0  = 6
31296  0   1   3   0   0   1   3   0  = 8
31304  1   3   3   3   0   1   1   0  = 12
31312  0   3   1   2   0   3   1   2  = 12
31320  0   1   0   0   3   1   0   0  = 5
31328  3   3   3   2   0   1   3   3  = 18
31336  3   3   3   2   3   1   0   0  = 15
31344  0   1   0   0   0   0   0   0  = 1
31352  0   0   2   0   0   0   2   3  = 7
31360  1   3   3   3   3   3   2   0  = 18
31368  1   3   3   3   0   0   2   3  = 15
31376  0   0   2   0   0   0   0   0  = 2
31384  0   0 128   0   0   0 128   0  = 256
31392  0   0 128   0   0   0 128   0  = 256
31400 192 192 192 192 192   0 128   0  = 896
31408  0   0 128   0   0   0 128   0  = 256
31416  0   0   0   0   0  12   4   8  = 24
31424  4  12   4  12   4   8   0  12  = 56
31432  4   8   0  12   4   8   0  12  = 48
31440  4  12  12  12   0  12  12   8  = 72
31448  0   0  16  14  16  14   0   0  = 48
31456  0   0   0   0   0   0   0   0  = 0
31464  0   0   0   0   0   0   0   0  = 0
31472  0   0   0   0   0   0   0   0  = 0
31480  0   0   0   0   0   0   0   0  = 0
31488  0   0   0   0   0   0   0   0  = 0
31496  0   0   0   0   0   0   0   0  = 0
31504  0   0   0   0   0   0   0   0  = 0
31512  0   0   0   0   0   0   0   0  = 0
31520  0   0   0   0   0   0   0   0  = 0
31528  0   0   0   0   0   0   0   0  = 0
31536  0   0   0   0   0   0   0   0  = 0
31544  0   0   0   0   0   0   0   0  = 0
31552  0   0   0   0   0   0   0   0  = 0
31560  0   0   0   0   0   0   0   0  = 0
31568  0   0   0   0   0   0   0   0  = 0
31576  0   0   0   0   0   0   0   0  = 0
31584  0   0   0   0   0   0   0   0  = 0
31592  0   0   0   0   0   0   0   0  = 0
31600  0   0   0   0   0   0   0   0  = 0
31608  0   0   0   0   0   0   0   0  = 0
```

```
10 '************************************
20 '
30 ' PROGRAM 1: BASIC LOADER FOR GAME
40 '
50 '************************************
60 MEMORY 30999
70 INK 0,1:INK 1,24:PAPER 0:BORDER 1:CLS:MODE 1
80 LOCATE 8,10
90 PRINT "DEBUGGIN' by T.A.Bratley"
100 LOCATE 12,14
110 PRINT "Copyright 1986."
120 LOAD "!DEBUGCODE",31000
130 CALL 31663
140 '********************************
150 '
160 ' PROGRAM 2: DECIMAL LOADER
170 '
180 '********************************
190 MODE 2
200 total=0
210 FOR n=31000 TO 33040
220 INPUT i
230 PRINT n,i
240 POKE n,i
250 total=total+i
260 NEXT n
270 PRINT "Checksum = ";total
280 STOP
```

```
31616  0   0   0   0   0   0   0   0  =   0
31624  0   0   0   0   0   0   0   0  =   0
31632  0   0   0   0   0   0   0   0  =   0
31640  0   1   1  10  10  14  14  14  =  80
31648 14  26  26  26  26  26  26  15  = 185
31656 15   6  26   6  26   6  26  17  = 128
31664 153 123 175 245  26  71  19  26  = 838
31672 79  19 241 245 213 205  50 188  = 1240
31680 209 241  60 254  11  32 236   6  = 1049
31688  1  72 205  56 188 175 205 150  = 1052
31696 187  62   1 205  14 188  62  60  = 799
31704 50 229 122  62   1  50 224 122  = 860
31712 205 144 187  33 240 192  34 225  = 1268
31720 122   1  25   0  17 185 131  33  = 514
31728  4  40 205 172 132  33 127 194  = 987
31736 34 227 122   1  25   0  17 223  = 649
31744 131  33   0   1 205 215 132  33  = 758
31752 112 195  34 225 122   1  27   0  = 716
31760 17 237 131  33  12  40 205 172  = 847
31768 132  33 255 196  34 227 122   1  = 1000
31776 30   0  17  30 132  33  16   1  = 259
31784 205 215 132   6   1  62  64 205  = 890
31792 30 187  32  32   4  62  65 205  = 617
31800 30 187  32  24   4  62  57 205  = 601
31808 30 187  32  16   4  62  56 205  = 592
31816 30 187  32   8   4  62  49 205  = 577
31824 30 187  40 215 120  50 223 122  = 987
31832 175  33  80  70  17 208   7 237  = 827
31840 82  16 252  34 216 122  33 207  = 962
31848 199  34 227 122   1  32   0  17  = 632
31856 127 132  33  25   1 205 215 132  = 870
31864 62  47 205  30 187  40 249 175  = 995
31872 205  14 188  42 189 130 237  75  = 1000
31880 187 130 237  66  48   4 237  67  = 896
31888 189 130  50 187 130  50 188 130  = 814
31896  50 100 130  50 101 130  62   7  = 630
31904 205 144 187 205 128 130  62   5  = 1066
31912 205 144 187 205 173 130 205 193  = 1442
31920 130  62   1  50  87 130  50 231  = 741
31928 122  62   6  50  91 130 205 213  = 879
31936 130 205 233 130 205  14 126  42  = 1085
31944 187 130 237  91 100 130  25  34  = 854
31952 187 130 205 173 130 175  50 230  = 1200
31960 122  50 100 130  50 101 130 205  = 888
31968  86 126  58 231 122 205  86 126  = 1040
31976  62  14  50 219 122  50 221 122  = 860
31984  71  62  10  50 218 122  50 220  = 803
31992 122  73 205   2 129 175 205  23  = 940
32000 129 205 168 128 205 205 127 205  = 1372
32008 205 126 237  75 216 122 205   8  = 1194
32016 126  62  44 205  30 187  40   7  = 701
32024  62  47 205  30 187  40 249  58  = 878
32032 232 122 167  32  35  58 231 122  = 999
32040 254  12  40   4  62  12  24  12  = 420
32048  58  87 130  60  50  87 130 254  = 856
32056  12 202 217 125  50 231 122 205  = 1164
32064  25 126 205 103 129 195 190 124  = 1097
32072  58 230 122 167  40 182  58  91  = 948
32080 130  61  50  91 130  40  42 205  = 749
32088 100 131 205  25 126 205  39 129  = 960
32096  58 231 122 254  12  32  17  58  = 784
32104  87 130  60  50  87 130  50 231  = 825
32112 122 254  12  40 100 195 190 124  = 1037
32120  33   0   0  34 100 130 195 190  = 682
32128 124 205 108 131 205  25 126 205  = 1129
32136 103 129  62   1  50 224 122 205  = 896
32144  14 180  62  80  50 229 122 175  = 920
32152  42 109 130 237  91 107 130 237  = 1083
32160  82  48   8   1  36   0  17  31  = 223
32168 132  24   6   1  33   0  17  67  = 280
32176 132  33 112 195  34 225 122  33  = 886
32184  12  40 205 172 132  33 207 199  = 1000
32192  34 227 122   1  32   0  17 127  = 560
32200 132  33  25   1 205 215 132  62  = 805
```

```
32208 47 205 50 187 40 249 195 209 = 1162
32216 123 175 205 14 188 30 12 7 = 757
32224 17 135 132 6 8 205 253 130 = 886
32232 33 14 6 17 143 132 6 10 = 361
32240 205 253 130 33 17 1 17 153 = 889
32248 132 6 19 205 253 130 62 47 = 854
32256 205 50 187 40 249 195 209 123 = 1238
32264 11 128 177 32 251 201 33 198 = 1023
32272 128 1 60 0 17 93 123 237 = 659
32280 176 237 75 93 123 205 2 129 = 1040
32288 62 4 205 23 129 205 168 128 = 924
32296 237 75 100 123 205 2 129 62 = 941
32304 5 205 23 129 205 168 128 237 = 1100
32312 75 123 123 205 2 129 62 6 = 725
32320 205 23 129 205 168 128 237 75 = 1170
32328 130 123 205 2 129 62 7 205 = 871
32336 23 129 205 168 128 201 33 113 = 1000
32344 126 167 40 5 71 35 35 16 = 495
32352 252 94 35 86 235 17 202 122 = 1073
32360 1 117 0 237 176 205 146 126 = 1088
32368 201 139 126 2 130 64 130 166 = 964
32376 130 228 130 9 134 51 134 153 = 975
32384 134 220 134 11 135 48 135 130 = 947
32392 135 207 135 0 1 2 5 18 = 583
32400 20 12 221 33 233 122 221 78 = 932
32408 0 221 35 197 221 126 4 205 = 1009
32416 23 129 221 78 0 221 70 1 = 743
32424 205 2 129 221 70 3 197 229 = 1056
32432 221 70 2 205 168 128 35 35 = 864
32440 35 35 16 247 225 1 00 0 = 639
32448 9 193 16 234 1 5 0 221 = 679
32456 9 193 16 207 201 221 33 93 = 973
32464 123 6 4 197 221 229 205 228 = 1213
32472 126 221 225 1 15 0 221 9 = 818
32480 193 16 240 201 221 203 6 70 = 1150
32488 32 95 58 218 122 221 190 0 = 936
32496 40 87 58 219 122 221 190 1 = 938
32504 40 79 221 53 4 40 51 221 = 789
32512 78 0 221 70 1 205 2 129 = 706
32520 221 126 5 205 23 129 205 168 = 1092
32528 128 221 126 0 221 134 2 221 = 1053
32536 119 0 79 221 126 1 221 134 = 901
32544 3 221 119 1 71 205 2 129 = 751
32552 221 126 5 205 23 129 205 168 = 1092
32560 128 201 221 126 2 237 68 221 = 1204
32568 119 2 221 126 3 237 68 221 = 997
32576 119 3 221 126 12 221 119 4 = 825
32584 201 221 203 6 70 32 27 221 = 991
32592 54 6 1 221 126 0 221 134 = 763
32600 9 221 119 7 221 126 1 221 = 925
32608 134 10 221 119 8 205 61 131 = 989
32616 24 3 205 175 127 58 218 122 = 932
32624 221 190 7 32 8 58 219 122 = 857
32632 221 190 8 40 74 221 126 7 = 887
32640 221 134 9 221 119 7 221 126 = 1058
32648 8 221 134 10 221 119 8 58 = 779
32656 218 122 221 190 7 32 8 58 = 856
32664 219 122 221 190 8 40 40 221 = 1061
32672 126 7 221 190 13 40 27 221 = 845
32680 126 8 221 190 14 40 19 221 = 839
32688 78 7 221 70 6 205 2 129 = 720
32696 221 126 11 205 23 129 205 168 = 1088
32704 128 201 221 54 6 0 201 62 = 873
32712 1 50 230 122 201 62 0 205 = 871
32720 30 187 32 7 62 72 205 30 = 625
32728 187 40 14 58 221 122 254 5 = 901
32736 200 61 50 219 122 62 0 24 = 738
32744 81 62 2 205 30 187 32 7 = 606
32752 62 73 205 30 187 40 14 58 = 669
32760 221 122 254 24 200 60 50 219 = 1150
32768 122 62 1 24 53 62 8 205 = 537
32776 30 187 32 7 62 74 205 30 = 627
32784 187 40 14 58 220 122 254 2 = 897
32792 200 61 50 218 122 62 3 24 = 740
32800 25 62 1 205 30 187 32 6 = 548
32808 62 75 205 30 187 200 58 220 = 1037
32816 122 254 19 200 60 50 218 122 = 1045
32824 62 2 50 222 122 237 75 220 = 990
32832 122 205 2 129 62 12 205 23 = 760
32840 129 205 139 128 58 219 122 50 = 1050
32848 221 122 71 50 218 122 50 220 = 1082
32856 122 79 205 2 129 229 35 6 = 807
32864 8 126 254 12 40 8 124 198 = 778
32872 8 103 16 245 24 20 33 232 = 681
32880 122 53 205 62 131 42 100 130 = 845
32888 58 223 122 95 22 0 25 34 = 579
32896 100 130 58 222 122 205 23 129 = 969
32904 225 24 29 229 213 197 245 6 = 1168
32912 8 197 6 4 229 26 119 35 = 624
32920 19 16 250 225 124 198 8 103 = 943
32928 193 16 238 241 193 209 225 201 = 1516
32936 229 213 197 245 6 8 197 6 = 1101
32944 4 229 26 174 119 35 19 16 = 622
32952 249 225 124 198 8 103 193 16 = 1116
32960 237 241 193 209 225 201 2 4 = 1312
32968 1 0 18 4 0 0 0 0 = 23
32976 1 8 18 0 24 19 25 255 = 350
32984 0 19 5 0 0 0 0 255 = 279
32992 9 18 0 4 1 24 0 255 = 311
33000 20 6 0 0 0 1 0 10 = 37
33008 20 18 0 20 5 0 1 20 = 84
33016 7 0 0 0 255 0 11 20 = 293
33024 2 0 213 33 176 191 17 60 = 712
33032 0 25 16 253 13 89 203 19 = 618
33040 203 19 22 0 25 209 201 17 = 696
```

INPUT MATCH

by Steven Underwood

One of the most powerful features of any computer is its ability to compare two items and to make a decision on the result. One of the most common demands made upon a computer is to compare a word inputted, with a list of words already in memory and once matched carry out the associated task.

This is heavily used in adventure games and any program that doesn't want to limit its user input to number driven menus. From Basic this is a simple task with lines of the form:

If A$= "One" Then . . .

However, from machine code, it is a much more complicated matter, although still a highly desirable one. A program to do just that in 68000 machine code on the ST is presented here.

Lines that begin with a ';' are comments and need not be typed in, lines that end with a ':' *must* be typed in as these are labels. The program will work on other 68000 computers provided that the *input* routine is replaced with an alternative one (lines 1-13) unless they also use GEM.

The program returns a zero in register *D0* if no match is found, or else the number of the word in the list that matched the typed in word. This can then be used by your program to carry out the correct action. The list of words can be added to limited only by size of the memory of your computer! However, each word must be terminated with a '13' byte, and after the last word a '0' byte must be added to let the program know it has reached the end of the list.

Lines three to eight use the GEMDOS *Call#10* to *Input* a line of text up to 255 characters long. Since the list of words uses a '13' to mark their end, a '13' byte has to be added to the word typed in, and this is done in lines nine to 13.

Line 16 sets the word counter, register *D0* to one, and lines 17 to 21 set up the registers A0-A4 so that they point at the list of words in memory (A2,A3), and the word typed in (A0,A1). Two registers are used in each case because each time the program loops round it 'loses' its starting point.

The main comparing loop is between lines 23 and 41. This compares each letter of the typed in word with the first word in memory, and then with each word in turn until the program either finds a match (Line 36) or runs out of match words (Line 39). Each time the program loops round D0 is increased by one (line 30), and in the case of no match is reset to zero (Line 40).

Lines 43 to 53 are the list of match words, and line 55 at the end of the program, is where the typed in word is stored in memory. If you use this program as a subroutine in your own, ensure that lines 55 onwards appear at the very end of your program and not in the middle! Otherwise the word typed in will be placed over part of your program and crash it!

```
1  START:
2  ;INPUT A WORD
3  MOVE.B#255,BUFFER
4  MOVE.L#BUFFER,-(SP)
5  MOVE.W#10,-(SP)
6  TRAP#1
7  ADDQ.L#6,SP
8  ;ADD A '13' TO THE END OF THE INPUTED
   WORD
9  MOVE.L#2,D0
10 MOVE.L#BUFFER,A0
11 ADD.B 1(A0),D0
12 ADD.L D0,A0
13 MOVE.B#13,(A0)
14 ;SET UP REGISTERS FOR THE MATCH
15 ;SET D0 COUNTER TO ONE TO START WITH
16 MOVE.L#1,D0
17 ;POINT TO INPUTED WORD
18 MOVE.L#BUFFERSTART,A0
19 MOVE.L A0,A1
20 MOVE.L#MATCH,A2
   ;POINTS TO LIST OF WORDS IN MEMORY
21 MOVE.L A2,A3
22 ;MAIN COMPARING LOOP
23 AROUND:
24 CMPM.B (A0)+,(A2)+
25 BEQ DOWN
26 MINI:CMP.B#0,(A2)
27 BEQ NOMATCH
28 CMP.B#13,(A2)+
29 BNE MINI
30 ADDQ#1,D0
31 MOVE.L A1,A0
32 JMP AROUND
33 DOWN:
34 CMP.B#13,(A0)
35 BNE AROUND
36 ;WORD MATCHES END ROUTINE WITH NUMBER
   OF MATCH IN D0
37 RTS
38 NOMATCH:
39 ;NO WORD MATCHED SO RETURN ZERO IN D0
40 MOVE.L#0,D0
41 RTS
42 ;HERE IS THE LIST OF WORDS TO MATCH WITH
43 MATCH:
44 D.B "ONE"
45 D.B 13
46 D.B "TWO"
47 D.B 13
48 D.B "THREE"
49 D.B 13
50 D.B "FOUR"
51 D.B 13
52 ;TERMINATING ZERO BYTE OF MATCH WORDS
53 D.B 0
54 ;INPUTED WORD STORED HERE
55 BUFFER:
56 ;DUMMY TWO BYTES
57 D.W 0
58 BUFFERSTART:
```

MICRONET 800

WANTED

AMSTRAD JOURNALIST

We need a knowledgeable and stylish staff writer to join our nine strong-team of journalists.

You will work independently, running your own Amstrad magazine on 500 Prestel pages, writing, commissioning, talking direct to your readers.

Amstrad and journalistic experience is essential CV and samples of your journalism should be sent to:

Sid Smith, MICRONET 800, Telemap Ltd, Durrant House, 8 Herbal Hill, London EC1R 5EJ. Tel: 01-278 3143

27PD0827

FREELANCE PROGRAMMERS

A very small number of 1st CLASS Free-Lance Programmers are sought to work on a number of PRESTIGE TITLES to be published WORLDWIDE by Elite during 1986.

If you wish to be associated with the publication or some of the major titles of the next twelve months, and can demonstrate responsibility for at least one TOP-FLIGHT published work, we would like to talk to you.

A choice of Royalty or Contract payment systems are available to you, as an integral part of the Free-Lance force behind one of the most dynamic software houses in Europe. This is your chance to be part of a small team associated with the Company responsible for major releases including:

which is now planning for worldwide growth in 1986.
Call Steve Wilcox now for a preliminary discussion on 0922 55852 or write quickly to:

Anchor House, Anchor Road, Aldridge, Walsall WS9 8PW West Midlands.

elite

WE NEED THE ORIC-CALLS

We have lots of goodies for the ORIC

Please contact us

W.E. (SOFTWARE)
FOLEY BANK, WORCESTER ROAD, GREAT MALVERN, WORCESTERSHIRE WR14 4QW
TEL: (06845) 69059 Prestel MBX 6684569059

W.E. SOFTWARE

UK AGENT FOR EUREKA INFORMATIQUE/ORIC PRODUCTS

27PD1001

GOEL COMPUTER SERVICES
45 BOSTON ROAD, LONDON W7 3SH Tel: 01 579 6133

SPECTRUM					
Heavy On the Magik	9.95	7.00	Cluedo	9.95	6.25
Sai Combat	6.95	7.00	Runestone	7.95	5.70
The Worm In Paradise	9.95	7.50	Rambo	8.95	6.50
Turbo Esprit	8.95	6.50	Elite	14.95	10.00
The Comet Game	7.95	5.30	Music System	15.95	11.95
Ghost 'n' Goblins	7.95	5.70	Shadowfire	9.95	7.00
Batman	7.95	5.70	Codename Mat-2 (d)	14.95	9.50
Twister	7.50	5.40	Turbo Esprit	8.95	6.50
Vectron	7.95	5.70	**COMMODORE 16/+4**		
Theatre Europe	9.95	7.00	Legionaire	7.95	5.75
Elite	14.95	10.25	Frank Bruno Boxing	7.95	5.75
Movie	7.95	5.70	Exploding Fist	9.95	7.00
Bounces	9.95	7.00	**COMMODORE 64**		
Siege on Volga	14.95	7.00	Silent Service	9.95	7.05
They sold a Million2	14.95	7.05	Green Beret	8.95	6.55
Superbowl	9.95	7.05	Shogun	9.95	7.20
Biggles	9.95	7.00	Doomdark's Revenge	9.95	7.00
Doomdark's Revenge	9.95	7.00	Empire	9.95	7.00
Robin of the Woods	9.95	7.00	Ghost 'n' Goblins	9.95	7.20
AMSTRAD			Bombjack	9.95	7.05
Southern Belle	7.95	5.65	Biggles	9.95	7.00
Saboteur	8.95	6.50	Ultima III disk	46.00	15.95
Kung Fu Master	9.95	7.50	Way of the Tiger	9.95	7.05
Biggles	9.95	7.00	Elite	14.95	10.25
			Comet game	7.95	5.70

Bounces	9.95	7.00
Quake minus One	9.95	7.00
Superbowl	9.95	7.05
Revs	14.95	10.50
Music System	14.95	10.50
Adv. Music System (d)	39.95	27.95
MSX		
Lazy Jones	9.95	7.45
Mr Wong's Loopy Lndry	7.95	5.85
Minder	9.95	6.75
Way of the Tiger	9.95	7.30
Way of the Exploding Fist	9.95	7.30
APPLE II		
Legacy of Llylgamyn	36.00	28.50
Elite	19.95	15.00
Gratorth	49.95	37.50
Cartels & Cutthroats	23.00	12.95
Theseus & Minotaur	19.95	10.50
Skyfox	19.95	14.95
ATARI		
Smash Hits Vol 1-4	9.95	7.00
Mr Robot	9.95	7.00
Quasimodo	9.95	6.00

VTX5000 MODEM WITH 1st Qtr Subscription to MICRONET 800 £49.99 £42.00. DON'T PAY ANY MORE FOR YOUR COMPUTER REPAIR...TAKE OUR 2 YEAR BREAKDOWN COVER FROM £35.

This is just a small selection from our stock. Most titles can be supplied at discounts of 30% +. Just write the titles required with a second choice and enclose the RRP less 30% eg. £9.95 @ 7.00, £8.95 @ 6.50, £7.95 @ 5.30. All prices include delivery. Overseas orders add 75p per tape. Please send POs, cheques payable to Goel Computer Services, 45 Boston Road, London W7 3SH. Telephone 01-579 6133 for enquiries etc.

25PD100a

Once Bytten

31 BOWNESS ROAD
LONDON SE6 2DG
Phone Orders: 01-698 2911
(Callers by Appointment Only)

IT'S THE WAY WE SELL 'EM!

THAT MAKES ONCE BYTTEN DISC THE BEST BUY. TOP QUALITY FLOPPIES FROM TOP FLIGHT MANUFACTURERS. 100% ERROR FREE – LIFETIME GUARANTEE AND NO HIDDEN EXTRAS . . . WHAT YOU SEE IS WHAT YOU PAY.

5¼" SS/DD 96tpi (Suitable for ***all*** drives up to 80 tracks, single or double sided). ***All*** prices include envelopes – ***All*** discs have hub-rings. Price per disc . . .

1+	10+	25+	50+	100+	500+	1000+
90p	80p	68p	65p	59p	55p	50p

5¼" DS/DD 96tpi (Suitable for ***all*** drives up to 80 tracks, single or double sided). ***All*** prices include envelopes – ***All*** discs have hub-rings. Price per disc . . .

1+	10+	25+	50+	100+	500+	1000+
£1.05	95p	80p	76p	69p	65p	60p

3½" SS/DD (Suitable for ***all*** drives, single sided). Price per disc . . .

1+	10+	25+	50+	100+	500+	1000+
£2.10	£1.85	£1.72	£1.67	£1.62	£1.55	£1.50

3½" DS/DD (Suitable for ***all*** drives, single sided). Price per disc . . .

1+	10+	25+	50+	100+	500+	1000+
£2.75	£2.45	£2.35	£2.25	£2.10	£1.95	£1.85

DISC BOXES

5¼" 10 Capacity 1+ £1.50 10+ £1.25
5¼" 100 Capacity Locking 1+ £11.95 12+ £10.00
5¼" 10 Capacity 1+ £1.50 10+ £1.25

EXTRA ENVELOPES 5¼"

10+ 9p 50+ 8p 100+ 7p 500+ 6p 1000+ 5p

LABELS

5¼" Label Sets (for 10 discs) inc. write-protects 1+ 35p 20+ 25p
3½" Label Sets (for 10 discs) 1+ 25p 20+ 20p

IMPORTANT NOTE:— Any order including 10 or more discs is POST FREE, otherwise please add £1.00.

VISA

Cheques or Postal Orders payable to AMTEN LIMITED please. Cash should only be sent by REGISTERED MAIL. You may pay by VISA or ACCESS card by mail or phone.

24PD1

Programming: Peek & Poke

ST colour

Paul Lambert of Maida Vale, London W9 writes:

Q I am intending to buy an Atari 520 STM but now that I have found out that it can only support low resolution when using television, I also want to buy a monitor.

What I want to know is that if I buy a colour monitor such as the Chroma I from Chromagraphica, which boasts 895 × 585 pixels, can it be used with all the graphics modes on the ST including the monochrome 640 × 400 pixels? If not, are there any other monitors which can support both colour and monochrome displays?

A One of the main problems with the ST is its monitor output (see *Popular Computing Weekly, Vol 5 No 23*) as there are two separate outputs, one for monochrome and one for colour. The colour signal is standard RGB, unfortunately, the mono output is 70Hz and so will not work with anything except a special monitor (Atari SM124). The advantage of the mono display being at 70Hz (most British micros are at 50Hz) is that the picture is rock steady and very clear.

As far as I know, there are no monitors that can cope with both 70Hz mono and standard RGBs so your only solution is to buy the SM124 if you want the high res mono picture. This will cost you £478 for the STM plus mono monitor, the price you pay for a *'leading edge'* machine.

Sprite approach to MSX

M Alvey of Abingdon, Oxfordshire, writes:

Q I have had an MSX machine for a year or so now, and have finally become interested in programming. After messing around with the sprites, I have noticed that it is not possible to have more than four sprites in a row across the screen. How can I find out which sprite has not been displayed?

Could you also recommend a good book about the MSX.

A Unfortunately, one of the limitations of the MSX sprite system is that it only allows four sprites to be placed across the screen at one time. Using the *VDP* command, it is possible to work out which sprite is violating this.

PRINT VDP(8) AND 31 tells you which sprite it is, and *PRINT VDP(8) AND 64* can be used to find out if the rule is being broken (gives 64 if there are more than four sprites across the screen, zero otherwise).

The best book on the subject is *The Complete MSX Programmers Guide* from Melbourne House.

On spec

C Baker of Hounslow, Middlesex writes:

Q I own a Spectrum Plus and am having a little difficulty which, I hope, you can sort out for me.

I am writing a program to ask a set of questions. How do I set up an array to store 100 questions and answers? I have the manual but the arrays don't seem to work.

A One of the stranger things about the Spectrum Basic is the way in which string arrays are defined. Unlike most other Basics, you need to specify the length of the string (number of characters it will hold), as well as the number of strings in the array. This effectively adds an extra dimension to the array definition.

In most standard Basics, DIM Q$(100), tells the computer to set aside a dynamic amount of space (all the strings are of zero length until something is put into them) for 100 strings. On the Spectrum, you will need to work out which is the longest question and then set up the string with array with that size, eg, say the longest question consists of 20 characters then the array definition will be *DIM Q$(100,20)*. This tells the computer to set aside space for 100 rows of 20 characters each, about 20K bytes. You will then need to do the same for your answers, hence an array of *DIMA$(100,20)* The problem is, on the Spectrum all of this space is set aside, not leaving very much room if any, for the program. You will need to keep the questions short, perhaps by making them all have the same intro, eg. 'What is' and then the question string.

The confusion begins when you actually need to access a string array. If you want the complete contents of the string, simply use *Q$(n)* where *n* is the question number. If, however, you want a section of a line of the array, the length of the string is needed. So if Q$(1) is "What is your name", *PRINT Q$(1)* gives 'What is your name', while *PRINT Q$(1,1-7)* gives 'What is'. Hopefully this makes things a little clearer.

Which one?

P R Grove of Coulsdon, Surrey, writes:

Q We are looking for a new computer capable of running a wordprocessor, database and the occasional game. The main contenders are the Amstrad CPC 6128, PCW 8512, or PCW 8256. Which one would you recommend?

Could you also give the names of a good wordprocessor and database for the 6128? Do you think that it worth buying the colour monitor instead of the green monitor?

A The computer games market currently produces games mainly for the CPC range of Amstrad micros; the PCW range is only covered by a few (though this is changing) software houses. From this point of view, the better computer to buy is probably the 6128 except that you will need to buy a printer as well.

Pocket Wordstar is a reasonably good wordprocessor at £50 from Micropro. It has years of experienced users to write manuals to help you learn what is essentially a fairly straightforward system.

Cardbox is a pretty simple database at £100 from Caxton. Again, it has been around for quite a while but lacks many advanced features one would expect from a database such as being able to get totals from sets of figures, etc. It is, however, very simple to use and is handy for quick access to phone numbers, addresses, etc.

It may be better to have a look around the Amstrad mags and then go to a dealer and see a package in action before buying, at least you know what you're getting. Another alternative might be to wait and see if Amstrad's rumoured IBM clone appears in the near future, since there are a number of games and vast quantities of good software available for IBM machines.

If you are thinking of playing the occasional game with your Amstrad, a colour monitor is the better buy. Unfortunately, for business applications it can sometimes be a little blurred.

Other games

Alan Franklin of Victoria, London SW1 writes:

Q I have a Spectrum Plus and hundreds of ZX81 games. I wonder if you could please tell me how to run ZX81 games programs on the Spectrum Plus.

A The most obvious answer to this is, forget it, you can't run ZX81 programs on the Spectrum Plus. The differences between the two machines are quite major.

Having said that, it may be possible to write some software to allow the Spectrum to emulate the ZX81, and interpret the ZX81 instructions. However, I don't know of any commercial software to do this so, you'd have to do it yourself (not easy).

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, 12-13 Little Newport Street, London WC2R 3LD

Screen Handler on QL

by Doug Lockhart

Having used a BBC recently I came to prefer that machine's screen handling over the QL's. The idea that you can use the whole of the screen rather than a measly four lines makes more sense.

Having reached this conclusion I decided to write a program to do just that. The program's only limitation is that all display commands, such as *Print* and *List*, must be suffixed by 0, (hash zero comma). If this is not done, then the screens may clash and output will not be directed to the appropriate part of the screen.

```
10 FOR a=0 TO 2
20 CLOSE #a
30 OPEN #a,con_452x236a30x10
40 MODE 4
50 PAPER #a,0
60 INK #a,7
70 CLS #a
80 END FOR a
90 PRINT #1,"BBC BASIC 32K"
100 PRINT #0\\\\
```

Memory Exposed on BBC

by Mark Lucknam

The following program provides a quick and easy method of examining the contents of memory. When run, the program asks for the start location of the dump, which should be entered as a decimal number. The option of using a printer is given but you should be aware of the fact that some printers do not provide a carriage return automatically. In this case the command, **Fc6,0* should be entered before running the program.

Pressing the space bar will dump each subsequent location, its contents and the Ascii character it represents. If the memory location contains a value of 31 or less it is represented as "??" to avoid crashing the program.

Pressing 'Q' exits from dump, turning the printer off and resetting the text window as it goes.

```
10CLS:INPUT"Enter start location ";A%
20PRINT"  Dump to printer ? (Y/N)":B%=GET:CLS
30PRINTTAB(13);:IFB%=89ORB%=121PRINT"Printer ON"ELSEPRINT"Printer OFF"
40PRINTCHR$129CHR$157CHR$131;"Location  Contains  Character"
50VDU28,0,24,39,2
60IFB%=89ORB%=121VDU2
70FORC%=A%TO65535
80PRINTTAB(5);C%;TAB(16);?C%;TAB(26);
90IF?C%<32PRINT"??"ELSEPRINTCHR$(?C%)
100*FX21,6
110E%=GET:IFB%=81VDU3,26:PRINTTAB(0,24);:END:ELSENEXT
```

Printer Shades on Spectrum

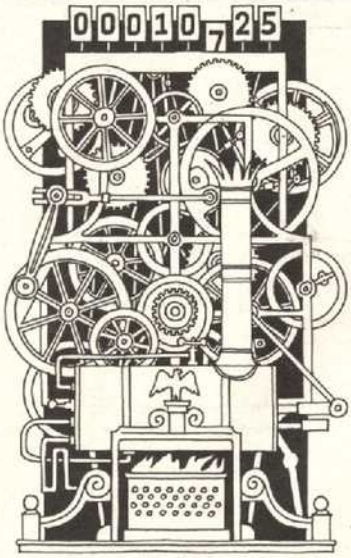
by P.Hiley

This utility produces a fully shaded screen *copy* on an ordinary ZX printer. Although it has not been tested with thermal replacements for the ZX printer (eg, the Alphacom), it may work with those which allow the normal *Copy* command to be used.

After running the hex loader, save it with *Save "shade" Code 1252,126*. It can be reloaded to any address using *Load "" Code (address)*, and is executed by *Randomize Usr (address)*.

As the contrast of the image is fairly poor, a dark picture may be improved by producing a negative image, so load in the routine and type *Poke ad+55,-3, Poke ad+56,0* , *Poke ad+65-2* where ad is the start address. These values are normally 29, 237 and 2 respectively.

```
 1 REM ** 'Printer Shade.'**
 2 REM       (c) P.Hiley.
 5 DEF FN V(A$)=CODE A$-55+(7 AND A$<"A")
 6 REM Note the capital "A"
10 LET AD=4E4: REM Start address.
20 READ A$,S
30 IF A$="" THEN  GO TO 9999
40 LET C=0: FOR L=1 TO 16 STEP 2
50 LET N=FN V(A$(L))*16+FN V(A$(L+1))
60 POKE AD,N
70 LET C=C+N: LET AD=AD+1
80 NEXT L
90 IF S<>C THEN  PRINT "ERROR"'A$: STOP
100 GO TO 20
199 REM Use Caps Lock for the Data.
200 DATA "F30100B0DD210058",762
210 DATA "C578FE039FE6025F",1060
220 DATA "D3FB05CDAA22DBFB",1346
225 REM
230 DATA "87CB7F2803FBCF12",984
240 DATA "30F40E2016080CB06",577
250 DATA "DD7E003005E6300F",709
255 REM
260 DATA "1804E6070707D61D",522
270 DATA "ED44DDCB00762002",881
280 DATA "C6024797DBFB1F30",971
285 REM
290 DATA "FA7BF680D3FB10FE",1479
300 DATA "7BD3FB1520D02CDD",1111
310 DATA "230D20C8C13E7FDB",881
315 REM
320 DATA "FE1F38073EFEDBFE",1137
330 DATA "1F300D783DE60728",550
340 DATA "0511E0FFDD191090",907
345 REM
350 DATA "3E04D3FBFBC90000",980
400 DATA "",0
```



VARDUMP

by Philip W Reynolds

VARDUMP is a 100% machine code variable dump program for any Spectrum. Although it is on the large side (1909 bytes) this program offers a number of useful features.

1) The code can be relocated to any position in memory.
2) Lists all variables, numeric or string and gives looping line information for a *For-Next* loop.
3) For numeric and string arrays lists dimensions and then all non-zero elements.
4) Output to the screen or ZX printer as an option. The program automatically presents an appropriate menu.
5) Any unprintable strings are printed as "?" to prevent the program crashing.
6) Can be called from within a Basic program to aid debugging. The *Border, Paper* and *Ink* colours are restored on exit.

The listing should be typed in as shown except for modifications to Lines 220 and 230 if you do not own microdrives. In this case Line 220 should be *Save z$Code 60000,1909* and Line 230, *Verify z$Code 6000,1909.*

Once the code has been correctly entered and run it is available for use. To reload, simply *Load* to the most convenient location to avoid clashes with the program you want a variable dump of. The *Load "name Code location* (tape) or *Load *"m";1;"name" Code location* (microdrive) command is used. To now call the program use *Randomize Usr x*, where x is the starting location of the code.

Key 's' starts the dump (or 'p' if the printer is attached) and 'q' stops it again before the next variable. The 'scoll?' message should be answered in the normal way by pressing a key other than 'n'. Key 'r' exits to Basic at the end of the dump or after 'q' is pressed. All registers are preserved on exit.

I hope you find this program as useful as I have. For those daunted by the task of entering all those hex codes copies may be obtained at £1.50, from Philip Reynolds, 6 St George's Square, St Annes-on-Sea, Lancashire FY8 2NY.

```
  10 CLEAR 59999: LET adin=60000
  20 LET ad=adin: LET li=1000
  30 RESTORE 1000
  40 FOR a=1 TO 39
  50 READ a$,ch
  60 LET tot=0
  70 FOR i=1 TO LEN a$ STEP 2
  80 LET hi=CODE a$(i)-48
  90 LET hi=hi-7*(hi>9)
 100 LET lo=CODE a$(i+1)-48
 110 LET lo=lo-7*(lo>9)
 120 LET byte=16*hi+lo
 130 LET tot=tot+byte
 140 POKE ad,byte: LET ad=ad+1
 150 NEXT i
 160 IF tot<>ch THEN  PRINT "Error in li
ne ";li;".""Check and re-run": STOP
 170 PRINT "Line ";li;" O.K."
 180 LET li=li+10
 190 NEXT a
 200 CLS : PRINT "Code in memory."
 210 INPUT "Name of code to save ? "; LI
NE z$
 220 SAVE *"m";1;z$+CODE 60000,1909
 230 VERIFY *"m";1;z$+CODE 60000,1909
 240 STOP
1000 DATA "F5E5C5D521A106095E2356237AB32
81:EB29D5E55E2356EB09EBE1732372E118E7210
4000936182236272336003A805C32B3",4815
1010 DATA "053A485C3254505E07328D5C32485
CE6308F0F0FD3FEAFDBFB8721570E53601F25F0
0E52197052336DCE136003E02CD0116",4344
1020 DATA "CD6B0D0E02CD0116116305014A00C
D3C20E17EFE0128170011C70501170DCD3C20060
23EFDDBFEE60220F01827001AD0501",3888
1030 DATA "1A00CD3C2011DE05111B00CD3C200
6033EDFDBFEE60120DA3EFDDBFEE60220EE0602C
53E02CD0116CD6B0DC1782155053600",4542
1040 DATA "21560570CD0116ZA4B5C3EFBDBFEE
601CA63023E0DD77EFE0920D0011BC06010F00C
D3C20C36302E5215505360:E1:FEDC38",4770
1050 DATA "05CD8B0118D2FEBE3805CD180218C
9FE9E3805CD3B0118C0FE7D3805CD40218B7FE5
F3805CD290118AECD5F0118A9F5112B",5071
1060 DATA "06010900CD3C20F1CD3805CDD402C
9D640F5112B060109D0CD3C20F1CD3805237EC87
F2005CD30051BF5D600CD3805CDD402",4930
E24CD3005CDFD02CD5104C9D620F5025A0511280
6010900CD3C201125060106020CD3C20",3591
1120 DATA "F1CD3005CDFD02CD5403C93E02CD0
1163A5505FE0020A001174060110000CD3C2011F
90501200CD3C203EFBDBFEE6020F0",4565
1130 DATA "3A5305328D9C3A5405324854CE6380
F0F0FD0FE3E02CD0116CD6B0D3E02CD0116D1C1E
1F1C9D5E56069AF1EFF01F0D0CD2A19",5396
1140 DATA "0118FCCD2A19019CFFCD2A190EF6C
D2A197DCDEF15E1D1C93E3DD7237E235E2356234
E234623E5CDB62ACDE32DE13E0DD7C9",5843
1150 DATA "78B10BC01AFE2030023E3F13D718F
13E28CD3805235E235623E57E23D5EB325B05215
C0573237232620D5D1E1D5E593E14D73A",4909
1160 DATA "5605D602EE01D756234E2346CDAF0
27AFE01281042805C53E2CD7234E2346CDAF02C11
0F23E29D73E14D73E00D73E0DD7D1E1",5136
1170 DATA "19C92BE5EB4678FE01282D00E52B5
62B5E1BEBD5160050AFED52AFED52D1E5EB23232
35E2356EB545D292919EBE1CD1E0521",5576
1180 DATA "5E05732372E1232310FC010100CDC
D03FE002000BC501050009C1102011 C06C501090
0CD3C20C1C5E53A5A05D73E28D7CDE2",4386
1190 DATA "03OE29D7E1CDD402C12B03D1D5AFE
5ED52E120C7E123C9E5C506052376FE00200610F
03E0010023E01C1E1C9F5C5D5E5215B",6190
1200 DATA "057EFE01200700CDAF02185800ED5
B5E0521600573237262669200600CD1E0513C54B4
2CDAF02C104E5215B057896E1283000",4114
1210 DATA "3E2CD7E5215D057896E1283000",4114
1210 DATA "3E2CD7E5215D057896E1283000",4114
1210 DATA "3E2CD7E5215D
```

POOLSWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

Boxed, with detailed instruction booklet

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools prediction aid. It comes complete with the largest database available – 22000 matches over 10 years. The database updates automatically as results come in.
- **PREDICTS** Not just SCOREDRAWS, but AWAYS, HOMES and NO SCORES.
- **SUCCESSFUL** SELEC guarantee that Poolswinner performs significantly better than chance.
- **ADAPTABLE** Probabilities are given on every fixture – choose as many selections as you need for your bet. The precise prediction formula can be set by the user – you can develop and test your own unique method.
- **SIMPLE DATA ENTRY** All team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below).
- **DISC/MICRODRIVE COMPATIBLE** Tapes supplied with conversion instructions.
- **PRINTER SUPPORT** Full hard copy printout of data if you have a printer.

AVAILABLE FOR Spectrum (48K), Commodore 64, VIC 20 (+16K), AMSTRAD, BBC B, Atari (48K), ZX81 (16K), Dragon, Apple II, ELECTRON

PRICE £15.00 (all inclusive)

All Programs Now Available on the QL & Amstrad PCW (add 3.00 for 3" disk)

FIXGEN 85/6

AT LAST: No more struggling for hours to get the fixture list into the computer. FIXGEN has been programmed with all English and Scottish fixtures for 1985/6. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner.

POOLSWINNER with FIXGEN £16.50 (all inclusive)

COURSEWINNER V3

THE PUNTERS COMPUTER PROGRAM

NOT JUST A TIPSTER PROGRAM, Coursewinner V3 can be used by experts and occasional punters alike.

You can develop and test your own unique winning system by adjusting the analysis formula, or use the program in simple mode. Coursewinner V3 uses statistical analysis of major factors including past form, speed ratings, course statistics, prize money, weight, going, trainer and jockey form etc, etc. It outputs most likely winners, good long odds bets, forecasts, tricasts etc. The database includes vital course statistics for all British courses. You can update the database – never goes out of date.

AVAILABLE FOR Spectrum (48K), Commodore 64, BBC (B), AMSTRAD, Atari (48K), Apple II

PRICE £15.00 (all inclusive) includes Flat AND National Hunt versions.

Send Cheques/POs for return of post service to . . .

VISA phone 24 hrs

selec SOFTWARE

phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. ☎ 061-428 7425

(Send for full list of our software)

You don't have to spend all your pocket money to get top quality software.

Latest Editions *to the best priced quality software NOW available in your shops!*

PUD PUD Spectrum 48K · DOPPLEGANGER Amstrad · SUBTERRANEAN NIGHTMARE Spectrum 48K · EYE SPY Amstrad · THE HULK Spectrum 48K C16 BBC Electron Atari · SPY TREK Amstrad · ROBOKNIGHT C16 · NECROMANCER CBM 64 · TREMOR Spectrum 48K · BEER BELLY BURT CBM 64 Atari · NUCLEAR NICK CBM 64 Atari

ALSO AVAILABLE ON DISC: OLLIES FOLLIES *CBM 64*; BREAKDANCE *CBM 64*; NEW YORK CITY *CBM 64 and Atari*; SCOOTER *Atari*

TAPE **£2:99** LICENSED TO THRILL AMERICANA SOFTWARE **£4:99** DISC

Americana Software, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Tel: 021-359 8881

FULL TIME PROGRAMMERS REQUIRED

Palace Software are moving from success to success. We are expanding yet again and need additional programmers to join our team.

The job involves working alongside some of the best games designers in the business—artists and musicians.

We are particularly looking for people who have at least some experience in Z80, 6502 (or similar) machine code.

We are interested in talking to people of all levels of knowledge. If you do not already have professional experience we will be happy to train you.

These are full time positions working at our Central London offices. Salary will be based on previous experience. In addition a royalty is paid on sales of games. Applicants should be at least 19 years of age.

Write or phone Peter Stone and tell him about yourself.

275 Pentonville Road, London N.1. Telephone 01-278 0751

Cracking the code

David Wallin tackles communications confusion with a brief look at the ASCII codes and their uses.

A Character Code is a method of referencing the characters that a computer can send. A number is given to each character and it is that number, in it's binary form that is sent down the phone line, or whatever is being used to link two computers.

ASCII is the most common character code there is. Other names for it are CCITT V3 and International Alphabet 5. Probably the next most common code is EBCDIC, Extended Binary Coded Decimal Interchange Code which is used extensively on the IBMs and compatibles.

As you can see, it's a seven bit code, that means that the binary versions of each code contains seven bits (bit: binary digit). The eighth bit can be used for parity, or may always be one or always be 0. Here, I have kept it set to 0.

ASCII codes from 0 to 32 decimal) and code 128 are special control codes, and are usually generated by ↑(CHARACTER). Some of the codes though, often have their own key; for example, the tab key. Many computers have, or will have a TAB key, which will return an ASCII value of nine (decimal) which is the ASCII TAB code. And although it can be generated by ↑I, more and more computers are having a TAB key as standard.

The definitions of the St codes are as follows;

NUL

NUL1 – This is a blank or null character. When a NUL is sent, time passes, but no information is changed. Bulletin Boards can be asked to send from 0 to 50 NULs after each return, different computers need different number. If you don't know how many you need try from 5 to 10.

SOH

Start Of Header – when sent, this means that what is about to come is the header to a block of information.

STX

Start of TeXt – this marks the end of the header and the beginning of the information (text) that it was the header to.

ETX

End of TeXt – this marks the end of a piece of information (text).

EOT

End Of Transmission – this is sent to indicate that transmission has ended.

ENQ

ENQuiry – sent by the host computer to ask the remote computer to send some information. Used on Prestel and Viewdata boards to ask for the customer ID which is often stored in the remote computer's memory and is sent automatically on reception of an ENQ. Often thought of a the question 'Who?'

ACK

ACKnowledge – sent to confirm that a block of information has been received correctly. Used on XMODEM data transfer to say that the checksum test worked.

BEL

BELl – when received, this emits a bleep on the comuter and is sometimes used for a 'Pager' to the SYSOP to indicate chat mode has been requested.

BS

Back Space – this code will move the cursor/print head back one space but NOT delete the character. Often on a keyboard, labelled as CANCEL or ←

HT

Horizontal Tab – this moves the cursor to the right a set number of places. It has the same effect as the TAB key found on some computers. Some comuters do not allow setting of tab positions and move by either 9 to 7 places.

LF

Line Feed – Moves the cursor/print head down a line, but the column stays the same. Most printers have an LF button.

VT

Vertical Tab – this moves the cursor/print head to a specified position. Similar to HT.

FF

Form Feed – Moves the print head to the

Binary Value	Decimal Value	Hexadecimal Value	ASCII Character	Keyboard Character
00000000	0	0	NUL	↑@
00000001	1	1	SOH	↑A
00000010	2	2	STX	↑B
00000011	3	3	ETX	↑C
00000100	4	4	EOT	↑D
00000101	5	5	ENQ	↑E
00000110	6	6	ACK	↑F
00000111	7	7	BEL	↑G
00001000	8	8	BS	↑H
00001001	9	9	HT	↑I
00001010	10	A	LF	↑J
00001011	11	B	VT	↑K
00001100	12	C	FF	↑L
00001101	13	D	CR	↑M
00001110	14	E	SO	↑N
00001111	15	F	SI	↑O
00010000	16	10	DLE	↑P
00010001	17	11	DC1	↑Q
00010010	18	12	DC2	↑R
00000011	19	13	DC3	↑S
00010100	20	14	DC4	↑T
00010101	21	15	NAK	↑U
00010110	22	16	SYN	↑V
00010111	23	17	ETB	↑W
00011000	24	18	CAN	↑X
00011001	25	19	EM	↑Y
00011010	26	1A	SUB	↑Z
00011011	27	1B	ESC	↑[
00011100	28	1C	FS	↑\
00011101	29	1D	GS	↑]
00011110	30	1E	RSL	↑
00011111	31	1F	US	↑–
00100000	32	20	SP	SPACE
01111111	127	7F	DEL	↑Delete

top of the next piece of paper on the printer.

CR

Carriage Return – this moves the print head to the start of the current line. It does NOT perform an LF as well.

SO

Shift Out – used to signify that the following characters are not ASCII standard. Applies to all following text until a SI is reached. Usually used to add graphics to the character set. Codes 0-31 remain the same.

SI

Shift In – signifies that the following characters are standard ASCII. Used to end a block of SO characters.

DLE

Data Link Escape – Changes the meaning of the next set of characters. Only graphics (values greater than 127) and transmission on control characters can be used in a DLE sequence.

DC1 DC2 DC3 DC4

Device Control Number (devices are numbered one to four – four characters used in the control of other devices. DC1 – DC3 have well known uses.;

DC1: *Xon* (handshaking)
DC2: *Tape*
DC3: *Xoff*

NAK

Negative AcKnowledge – sent to say that a block of information has been received with errors and to request a re-transmission. Used on *XMODEM* data transfer to say that the checksum test failed.

SYN

SYNchronus idle – used in synchronus transmission while no data is being sent, to enable the computers to stay synchronised.

ETB

End of Transmission Block – indicates that transmission of a block of data has ended.

CAN

CANcel – informs the other computer that it has just received an error. Should not be confused with the keyboard key, CAN, which usually generates BS.

EM

End of Medium – indicates that the end of a medium (eg a tape) has been reached.

SUB

SUBstitute – used to substitute a character which was sent wrongly.

ESC

ESCape – used to change the meaning of the next character only. Used in communications packages to enable the user to perform an operation such as *XMODEM* transmit without using up valuable ASCII control codes which are needed.

FS

File Separator – ends a block of information called a file.

GS

Group Separator – ends a block of information called a group.

RS

Record Separator – ends a block of information called a record.

US

Unit Separator – ends a block of information called a unit.

DEL

DELete – erases an unwanted character. Effectively, it moves the cursor/print head back one character, prints a space and then moves back again.

The Return/Enter key on your computer usually has an ASCII value of 13, which is [CR] not [CR] [LF]. So therefore, the host computer must not only echo back a [CR] when you type one but an [LF] as well. This is called an [NL], New Line and is ASCII 11 followed by ASCII 13. When in BASIC or another language, the OS will automatically give an [NL] when Return/Enter is pressed.

All of the codes can be used locally as well. That means that they can be typed on your computer and affect your computer.

To the person who just uses a modem and computer to access Micronet and the odd Bulletin Board, the past 2 weeks will have been rather boring. I would like to apologise to those people concerned, before they get a chance to write and complain! Seriously though, to the person who uses comms. seriously, an ASCII list and control codes list, it is invaluable. Although most books and manuals have one, it's always in the back, when you need the book open at the front! So a separate list is very useful.

THE WRITE STUFF

• Practical Amstrad Word Processing is a complete self tutor for anyone trying to get to grips with Locoscript on the Amstrad PCW 8256 and 8512 word processors.

• The self contained sessions in the book lead step by step through the concepts behind practical word processing and the use of the powerful Locoscript facilities. Each session concentrates on one or two major features of Locoscript, and programmed exercises show how those features are incorporated into everyday work. The areas covered by the sessions include not only the ways to improve the presentation of documents, but working methods which use Locoscript's file groupings and layouts and templates to dramatically cut the time needed to prepare a wide range of standard documents and forms.

To Theresa Lacy, Sunshine Books
12/13 Little Newport Street
London WC2H 7PP

Please send me _____ copies of Practical Amstrad Word Processing ISBN 0 946408 94 7 at £7.95 (plus 90p p + p)

I enclose a cheque/postal order for £_____ payable to Sunshine Books
Alternatively please debit my Visa ☐ Access ☐
American Express ☐
Account Number _____ Expiry Date _____
Signed _____
Name (capitals please) _____
Address _____

REWARDING OPPORTUNITIES WITH MIKRO-GEN

Following Mikro-Gen's move to new premises we now require additional 6502 programmers. If you believe your programming ability meets our high standard, please contact us by telephone or letter to the address below.

We also require finished programmes. Top payment or royalties given to software of suitable quality.

Mikro-Gen, Unit 15, The Western Centre, Western Road, Bracknell, Berks. RG12 1RW. Telephone number (0344) 427317

SMASH HITS AT CRAZY PRICES

FIRST BYTE CLUB — SOFTWARE SUPER BUYS, — ORDER NOW.....

* * *

Sinclair Spectrum

Title	RRP	YOUR PRICE
Hyper Sports	7.95	3.95
Monty on the Run	7.95	3.95
Mikie	7.95	3.95
Yie Ar Kung Fu	7.95	3.95
World Series Basketball	7.95	3.95
Gyroscope	7.95	3.95
Way of the Exploding Fist	8.95	3.95
Rambo	7.95	3.95
Arcade Hall of Fame	9.95	3.95
Dambusters	9.95	3.95
International Karate	6.95	3.50
Beach Head II	7.95	3.50
Winter Games	9.95	3.95
Impossible Mission	7.95	3.95
Transformers	7.95	3.95
Cosmic Wartoad	7.95	3.95
They Sold a Million	9.95	3.95
Mini Office	5.95	2.95
Skool Daze	5.95	2.50
Daley's Supertest	6.95	3.50
Rolands Rat Race	7.95	3.95
Lord of the Rings	15.95	5.95

Commodore 64

Title	RRP	YOUR PRICE
Arcade Hall of Fame	9.95	3.95
Beach Head II	9.95	3.95
Dambusters	9.95	3.95
Fight Night	9.95	3.95
Goonies	9.95	3.95
Gyroscope	9.95	3.50
Hyper Sports	8.95	3.95
Impossible Mission	9.95	3.95
Mini Office	5.95	2.95
Monty on the Run	9.95	3.50
Pitstop II	9.95	3.50
Rambo	8.95	3.95
Raid over Moscow	9.95	2.95
Starion	9.95	3.95
Super Huey	14.95	4.95
Super Zaxxon	9.95	3.50
Summer Games II	9.95	3.95
Thing on a String	9.95	3.50
Transformers	9.95	3.95
Way of the Exploding Fist	9.95	3.95
World Series Baseball	9.95	3.95
Winter Games	9.95	3.95

Amstrad

Title	RRP	YOUR PRICE
Daley Thomson Super Test	8.95	3.95
Hyper Sports	8.95	3.95
3-D Boxing	9.95	3.95
They sold a million	9.95	3.95
Way of the Exploding Fist	9.95	3.95
Lord of the Rings	15.95	5.95
Bruce Lee	9.95	3.95
Yie Ar Kung Fu	9.95	3.95
Football Manager	8.95	2.95
Match Day	9.95	3.50
Everyones a Wally	9.95	2.95
Never Ending Story	9.95	3.95
Daley's Decathalon	9.95	2.50

Commodore 16/+4

C16 Classics	9.95	3.95
Daley's Star Events	7.95	3.95
Sword of Destiny	6.95	2.95
Gullwing Falcon	6.95	2.95
Dark Tower	5.95	2.95

Atari users send SAE for list.

A selection from our Summer SuperBuy catalogue . . . . all orders placed will entitle you to free membership and catalogue. Prices include P&P UK only (overseas add 75p for each tape ordered). Order by sending details plus name, address and post code. (Make cheques or P.O. payable to: First Byte Club) 36, John Kempe Way, Birmingham B12 0HU. Or use Visa by telephoning your No. to: 021 771 4480 or 773 6615.

POST TODAY TO AVOID DISAPPOINTMENT.

Sound terminology

MARK JENKINS on micro music terminology and Spectrum packages . . .

Before we go onto some of the latest developments in micro music, it seems that an explanation of some common terms would be useful. Chris Jordan of Hybrid Technology, the developers of the powerful Acorn 500 synth module for the BBC B, has been in touch with some sections from the handbooks of the 500 and its AMPLE programming language, so with some adaptation, here's the first part of our micro music glossary.

ACCIDENTAL

In conventional music notation, the temporary modification of the pitch of a note, either a *semitone* up (sharp) or down (flat).

ADSR

Simple description of a standard *envelope* or change in a parameter over time, standing for *attack, decay, sustain, release*. Applied to an *amplifier* to control volume or to a *filter* to control tone.

AMPLITUDE

Technical term for Level.

ATTACK

The build-up in *amplitude* of a parameter from the start of a note (when a key is pressed or a command sent) to its highest level. Attack is a measure of time – a fast attack means a sound begins suddenly, like a piano, a slow attack means it begins gradually, like a string section.

ANALOG

Using conventional electronics to produce sounds; analog synths (Roland, Korg, Sequential) can be digitally controlled and MIDI-compatible, but tend to sound fatter and smoother than digital synths (Casio, Yamaha).

BAR

A division of musical time. Every bar has the same total of note lengths, and so if the *tempo* is steady, each bar lasts for the same amount of time.

BAR LINE

Score mark which ends one bar and begins the next.

BEAT

Shortest musical division in use at any time.

CHANNEL

Various applications; on the Acorn 500 refers to a single sound generator with its own pitch and stereo position, in MIDI applications to the 16 coded transmission lines which can each control one or more synthesisers polyphonically, on a mixing desk to an input for one instrument, and so on.

CHORD

Two or more notes sounded together; the relationships of the notes determine the type of chord – major, minor, seventh, and so on.

CHORUSING

Thickening a sound to give the impression of more than one instrument playing the same notes. Can be achieved by programming a second *voice* with slight *detuning*, or by adding a hardware chorus unit such as a *delay line*.

DECAY

The decreases in amplitude of a parameter after the end of the *attack* phase. Decay is a measure of time, and the amplitude decays to the *sustain* level. A piano has a long or slow Decay, since the notes fade while the keys are still held down; an organ sound has no decay, since it stays at the same volume for as long as a key is held.

DELAY LINE

Hardware intended to store a sound temporarily and re-mix it with the original. Creates echo, chorus and various other effects.

DE-TUNING

Slightly altering the pitch of one of a pair of sounds, by a fixed or variable amount, to create thicker sounds.

ENVELOPE

Description of the change in level of a parameter over time. On a synthesiser, controlled by an Envelope generator (EG), or ADSR; can be applied to volume, filtering, pitch, *pulse width* or other parameters.

EQUALISATION

Time-honoured term for the control of tone, achieved with a graphic or parametric equaliser, or most simply with bass and treble controls on an amplifier.

More of the Micro Music Glossary next week. Now, on to some news from XRI Systems.

XRI now have several MICON MIDI products for the 48K Spectrum and are about to launch their Amstrad 8256 range. Already available, the Step Time Sequencer uses XRI's MIDI Interface (£59.95) to compose music in eight tracks of up to 2,900 steps for a total of 26,200 steps.

Notes are entered from the keyboard of a MIDI synth and timings are entered from the computer. Single notes or chords can be entered, sequences can be saved to cassette or microdrive and tracks can be assigned to different MIDI channels on playback.

The package synchronises to MIDI or a clock pulse, but XRI also sell three sync boxes – MIDI-Tape/Tape-MIDI for £55.95, MIDI-DIN Sync/DIN Sync-MIDI for £49.95, and MIDI-Tape & DIN SYNC/Tape-MIDI & DIN Sync for £65.95.

Other products include a Yamaha DX7/TX7 synth graphic voice editor (£24.95), a Casio CZ synth graphic voice editor (£22.95), a DX7/TX7 voice library with 224 new sounds and tape save (£24.95), a Roland Juno 106 synth Toolkit editor/library (£19.95) and a Database System for patch and song tape save from most synths and drum machines (£22.95).

The new Multi-Tracker program records eight polyphonic tracks in real time and can auto-correct your playing synchronised to a metronome beat, a drum machine, a MIDI unit or a previous track. Bars can be added, inserted, deleted and repeated to create a complete song and different MIDI channels can be assigned to each track on playback.

Microdrive or Opus Discovery may be used to store sequences which can be over five minutes long. Price is £24.95, with an expanded version coming up for £16 (exchange) or £38.95 for the two programs bought together.

XRI Systems, 10 Sunnybank Road, Wylde Green, Sutton Coldfied, West Midlands B73 5RE, 021-382 6068.

CLASSIFIED

Semi-display — £7 per single cc (+ VAT)
Lineage — 30p per word (+ VAT)

CALL RODNEY WOODLEY on *01-437 4343* FOR SEMI/DISPLAY ADVERTISING

SOFTWARE

HOME ACCOUNTS. Put your house in order! Comprehensive coverage of bank accounts, credit cards, HP, etc. Inbuilt accuracy check. projects cash flow for any period. Available for Commodore, Amstrad and Spectrum £8.45. Free details from Discus Software, Freepost, Beach Approach, Brixham TQ5 8BR. Tel: 08045 55532.

AMSTAT – AMSTRAD STATISTICAL AND MATHEMATICAL SOFTWARE

AMSTAT1 – means, s.devs, t-tests, 1-way-ANV, 2-way-ANV, correlations, regressions, histograms, scatterg-ams, transformations, file storage and retrieval. manual, £14.99 cass, £19.50 disc. (*CPC Computers Only*).
"The program will be most useful to departments and individuals who wish to process data quickly and without too much fuss." – **Ian Franklin**, *Bulletin of the British Psychological Society*, December 1985.
"... excellent value for money" – **Jo Stark**, *Computing with the Amstrad*, January, 1986.
"An excellent buy for school level." – **Tony Kendle**, *Popular Computing Weekly*, 8-14 May 1986.

AMSTAT2 – 27 non-parametric tests in 4 programs providing a "complete Siegel" (binomial, Chisquare(3), Kolmogorov-Smirnov(2), Runs, McNemar, Sign, Wilcoxon, Walsh, Randomisation(2), Fisher, Median/extremes, Mann-Whitney, Wald-Wolfowitz, Moses, Cochran, Friedman, Kruskal-Wallis, Contingency, Spearman, Kendall, Kendall partial, Concordance. £39.95 inc manual. (*CPC and PCW Computers*).
"Tremendous value" – **Tony Kendle**, *Popular Computing Weekly* 8-14 May 1986.
"I now give it an unreserved recommendation" **Jo Stark**, *Business Computing with the Amstrad*, July 1986.

AMSTAT1 + AMSTAT2 £49.95 (disc or cassette) (*CPC only*).

FORECASTING – THE ORIGINAL JPC SOFTWARE (AMSTAT3) from July
A phenomenal array of business oriented mathematical and statistical software! Linear and Polynomial regression, Trend and Seasonal Variation, Multiple Regression Analysis, Transformations, Exponential Smoothing, Adaptive Filtering.
Graphic display, full printout, outstandingly comprehensive manual suited to immediate use and for teaching.
Sales, production planning, work and method study, financial planning, personnel, social work, students, research, whatever your field this package will have something for you. The programs, developed during extensive teaching and consultancy, use the power of your AMSTRAD to analyse trends and patterns and improve your DECISION MAKING beyond all recognition.
(*CPC version* £25.95, *PCW version* £27.95.

RESOURCE MANAGEMENT – LINEAR PROGRAMMING MODULE (AMSTAT4) (from July).
Three programs: General Purpose Linear programming + Specialised Transportation and Assignment variants. Capable of analysing and solving problems of sequencing, scheduling, blending, and allocation of scarce resources. 40 page manual, 18 worked examples.
CPC version £25.95./PCW version £27.95.

The complete AMSTAT Range (CPC only) £99.95

All prices include P&P within U.K. Cheques, POs to
S. C. COLEMAN
33 Leicester Rd, Ashby-de-la-Zouch, Leics. LE6 5QA. Telephone: 0530 415919
Technical Enquiries after 6 pm or Weekends
25PC17

SPECTRUM ADVENTURE OFFER

Three 48K Spectrum Adventures for only £7.95 plus FREE strategy game

We have a limited supply of:
PARADOX – difficult but not (quite) impossible.
SPOOF – hilariously funny spoof on adventures.
ROBY HODE – massive adventure in two parts. +
SPECTREALM the best rule-a-country written.
All adventures as yet unsolved.
All four programs received good press reviews.
Prices inclusive of P&P.
Delivery within 10 days – and that's a promise.
Cheques/POs to: ***27PL4***

Adventure Offer
A.C.D COMPUTER SERVICES
32 HAREWOOD AVENUE, HIGHBURY VALE
NOTTINGHAM NG5 9EF TEL (0602) 763579

400/800 XL/XE — LOOK — NOW ST
ATARI OWNERS
Are you having difficulty finding suitable software.If so, then look no further. We have available for both hire and purchase one of the largest selections of both UK and American titles to choose from. Games and Utilities for all ages. Hardware and add-on utilities at discount prices and special deals regularly being offered. If you would like further information please send a large S.A.E. to:—
CHARNWOOD PRODUCTS AND GAMES
30A Warwick Avenue, Quorn, Loughborough Leicestershire LE12 8HD
Tel: 0509 413804

SPECIAL OFFER
ON AMSTRAD SOFTWARE

TASWORD 6128	**£18.95**
TASPELL	**£12.50**
Both programmes for only	**£30.00**
DMP2000 RIBBONS	**£5.25**
Two for **£10.00**	
Labels Fanfolded × 1000	**£5.95**
Labels Fanfolded × 2000	**£10.95**

Prices inc. postage, packaging & VAT
Please send cheques/PO's to:
MJC SUPPLIES, 'SCOJA',
London Road, Hilchin,
Herts, SG4 9EN 27PL1
Access Orders/Enquiries **0462 32897**

FOR COST–EFFECTIVE CLASSIFIED ADVERTISING CALL RODNEY WOODLEY ON 01-437 4343

CHEZRON SOFTWARE
(Dept. 408) 605 Loughborough Road Birstall LEICESTER LE4 4NJ
£3.50 each
PRO-MAT for easier control of your printer. EPSON, BROTHER M1009 & HR5. KAGA TAXAN via I/Face 1, KEMPSTON, TASMAN or POUS. State printer and interface when ordering.
PROGS-FILE for program records, easy use, can read M'Drives. Hard copy I/Face 1, Kempston or ZX-type printer.
'NO Quibble' refund if dissatisfied, SAE brings details.
27PL06

PELAGON SOFTWARE
Adventures beyond imagination
★ TERRAFORM (space adventure)
★ Crystal of Charnle (Fantasy)
★ Dollars in the Dust (Western)
3 great games only £2.35 each or £5.95 for all three (inc p&p) chq/po payable to PELAGON SOFTWARE or write for details to:
PELAGON SOFTWARE, 6 Ronnie Mews, North Bersted, Bognor Regis, W. Sussex, PO22 9AU

EDITOR. Redefine status, rating, fuel, cargo, weapons, credits, galaxy, special missions, even cloaking device and E.C.M. Jammer. Alter every feature for only £1.99 (SPECTRUM).
ASTROCADE Collection. Six M/C games of arcade and adventure. Your Sinclair (JULY) gave it 8/10 playability and 8/10 value for money. Now less than half price, only £1.99 + 40p P&P. (SPECTRUM)
PROGRAMS wanted, to expand our popular range of budget software. We will pay cash for your games. Send to:
D.D.S.
49 Beaumont Road, Halesowen, West Midlands, B62 9HD

For All Your
MSX
SOFTWARE/HARDWARE
SEND SELF ADDRESSED ENVELOPE TO:
FACULTY ENTERPRISES,
29 Rutland Court,
Ponders End, Enfield
Middlesex 01-805 8054
27PL3

CLASSIFIED ADVERTISING RATES:

Line by line: 30p per word, minimum 20 words.

Semi-display: £7 per single column centimetre, minimum length 2 cm. (Please supply A/W as PMT. Or supply rough setting instructions.)

THESE RATES DO NOT INCLUDE VAT.

Conditions: All copy for Classified section must be pre-paid. Copy date 7 days before publication.

IF YOU WISH TO DISCUSS YOUR AD, PLEASE RING Rodney Woodley 01-437 4343.

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

		Please continue on a separate sheet of paper	

I make this ..... words, at ..... per word so I owe you £ .....

Name .....

Address .....

.....

.....

Telephone .....

Please cut out and send this form to: Classified Department, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP. HA16

The 1st choice

EXPRESS SPECTRUM, BBC and COMMODORE REPAIRS!

SOFTWARE RRP £24.00 FREE WITH EVERY REPAIR*

WHY PAY HIGH 'FIXED' PRICES

Spectrum repairs between £9 and £20. BBC repairs between £14 and £45. Commodore repairs between £14 and £35.

*Spectrums only

(We do not charge you for our fancy premises by charging high 'fixed' prices!)

Reputations take time to build, we have been repairing ZX 81's, Spectrums, QL's, Apples and BBC's professionally, for 2½ years – who is coming second?

In all U.K. with While-u-Wait repairs! with INTERNATIONAL repair service!

to charge LOW PRICES for the smaller repairs! (e.g. £9 for keyboard faults)

FOR LOW PRICES – "My computer blew recently. I took it to **MANCOMP**, who fixed it in 8 minutes! and for less than £10! They are local, clued up, and blindingly efficient!" 4 HEATONS DIGEST

FOR PROFESSIONALISM – "Of all the repair companies 'Sinclair User' spoke to, **MANCOMP** seemed the MOST PROFESSIONAL when it came to advice and a helpful attitude" AUG 85.

FOR HONESTY – We let you watch your computer being repaired and if there is nothing wrong with it, we will tell you!!!

FOR REPUTATION & HELPFULNESS – "I have come across a firm that will be more than willing to advise you as to how to remedy your problems. They are called **MANCOMP** and as well as repairing faulty computers, are also quite willing to discuss your problems with you and offer reasonably cheap and more importantly CORRECT CURES" Phil Rogers POPULAR COMPUTING WEEKLY JAN 85.

FOR SPEED – "One firm at least can effect any necessary repairs over the counter in 45 minutes. Based in Manchester, **MANCOMP** can offer what is arguably the FASTEST turnaround in the business to personal callers" CRASH Magazine JUNE 1985.

THIS IS WHY Spectrum users from London, Cornwall, Scotland, Birmingham, Liverpool, Coventry, Leicester, Glossop, I.O.M., etc. AUSTRALIA, AUSTRIA, BELGIUM, EGYPT, EIRE, GERMANY, HOLLAND, KUWAIT, NORWAY, PAKISTAN, PAPUA NEW GUINEA, SAUDI ARABIA, SWEDEN, SWITZERLAND and ZIMBABWE – send their Spectrums to MANCOMP for repair!

24 HR. TURNAROUND NO-QUIBBLE GUARANTEE NO HIDDEN COSTS.

Because we repair hundreds of computers every week, we are able to pass on our 'component-buying discount' to YOU in lower prices . . . Z80A cpu £1.50, 4116 50p. Upgrade *fitted* £18.95

– we bring down the prices for repairs and components!

(We may refuse to revive computers suffering from attempted D.I.Y. repairs!)

Every parcel sent by Royal Mail Receipted Post and insured for return journey!

(For next day delivery include £1.50 extra).

(Securicor by prior arrangement).

On-site maintenance for Apples, I.B.M.'s and most makes of printers also available.

Guaranteed 4hr response!

WHY DELAY – OUR ESTIMATES ARE FREE AND WITHOUT OBLIGATION. IF YOU DO NOT LIKE OUR ESTIMATE WE WILL RETURN THE COMPUTER AND REFUND THE POSTAGE INCURRED

MANCOMP LTD
(Dept PCW26)
Printworks Lane, Levenshulme, Manchester M19 3JP
Phone 061-224 1888.
OR 061-224 9888.
OPEN MON - SAT 9am to 7pm

What we do today . . . others do tomorrow!

NOTE OUR PRICES AND WATCH OTHERS FOLLOW THE LEADER

. . . and his team of computer repair specialists are here to offer a complete professional service.

FREE £15 cartridge with every Commodore 64 repair

Spectrum £17.99
Commodore 64 .... £29.95
BBC £29.95
(including parts & p/p)

FREE software with every Spectrum repair

We also repair Amstrad, Oric, Atari, Vic 20, Printers, Disc drives etc.

★ WHILE-U-WAIT SERVICE
★ FAST TURN AROUND
★ 3 MONTH GUARANTEE
★ FREE SOFTWARE
★ DIY COMPONENTS

ZEDEM COMPUTERS LIMITED
2 Kimbolton Road
Bedford MK40 2NR

Call (0234) 213645/213032 7 days a week 24 hr. answering service

LONDON COMPUTER REPAIR CENTRE

★ Spectrum, Commodore, BBC, Atari, Amstrad etc.
★ Low cost repairs from £12.00
★ Collection & delivery optional
★ Used Micro's bought, sold, exchanged.

Call **NIGEL: 01-863 7166**

MICRO SUPPORT
Unit 3, 15 Springfield Road, Harrow, Middx, HA4 1QF.
13PL3

CHILTERN COMPUTER SERVICE
FOR FAST RELIABLE REPAIR SERVICE
SPECTRUM £18.00
WE ALSO REPAIR CBM 64 & BBC, VIC 20, ORIC, AMSTRAD, PRINTERS & DISC DRIVES
Ask for details.
We give 3 months warranty on replaced parts.
Send computer with details of fault and cheque made out to:
CHILTERN COMPUTER CENTRE
98/100 HIGH TOWN ROAD, LUTON, BEDS
TEL: 0582 455684
Overseas enquiries welcome
PL261

TECHNICOM SERVICES
(South West)
UNIT 5, TRANSOM HOUSE,
Victoria Street,
Bristol BS1 6AH
Tele: Winscombe (093 484) 3460
SINCLAIR/COMMODORE & AMSTRAD SPECIALISTS
from £12.50 + Parts and P&P, 3 months guarantee 27PL8

Access

Book your Classified or Semi-display advert by Credit Card

AMERICAN EXPRESS

Call Rodney Woodley on 01-437 4343

VISA

SERVICES

FAULTY SPECTRUM?

As you are probably aware from press reports Sinclair Computers no longer have a repair department.
Our computer repair workshop has been an **OFFICIAL** Sinclair Repair Depot for the past six years and we are pleased to announce that we will continue to do your out of guarantee repairs as in the past.
Send your faulty computer **DIRECT**

SPECTRUM	**£18.75 inc parts**
ZX81	**£11.50 inc parts**
16K RAM	**£9.95 inc parts**
MICRODRIVE	**£15.95 inc parts**
INTERFACE 1-11	**£18.75 inc parts**

CALL OR SEND WITH CHEQUE OR P.O.

T.V. SERVICES OF CAMBRIDGE LTD
FRENCH'S ROAD
CAMBRIDGE CB4 3NP
Tel: 0223 311371

18TV

BBC SPECTRUM REPAIRS
★ Spectrum repairs £18.50 inc. parts insurance and p.p
★ BBC B repairs £18.50 + parts, insurance and p + p.
Send your computer with cheque or P.O. for £18.50 and description of fault to:
SUREDATA (PCW)
Computer Service
45 Wychwood Avenue, Edgeware, Middx.
Tel: 01-951 0124 23PL53

COMMODORE REPAIRS
by Commodore approved engineers

★ *CBM Power Supplies*	*£15.00*
★ *VIC 20 Modulators*	*£8.05*
★ *VIC 20 from*	*£14.50*
★ *CBM64 etc*	

For more details write or tele:
G. C. BUNCE & SONS, 36 Burlington Road, Burnham, Bucks SL1 7BQ.
Tele: 06286-61696 27PL02

FOR SALE

SINCLAIR REPAIRS

SPECTRUM/PLUS	**£12.00**
KEYBOARD	**£8.50**
INTERFACE I/MICRODRIVE	**£17.00 each**

All prices are fully inclusive of p&p and VAT
Send Cheque with computer only unless power supply suspected. Callers Welcome

I. T. WESTERN ELECTRONICS
Unit F2A & F3
Avonside Enterprise Park
Newbroughton Road,
Melksham, Wilts
Tele: (0225) 705017 27PL5

SCOTLAND'S No 1
for home and personal computer repairs specialty fast SPECTRUM service!
★ *Same day for most faults*
★ *1 hour of delivered personnaly*
★ *Free estimates*
★ *Upgrades. Membranes and P.S.U's*
★ *3mth. warranty on work done*
★ *Open 6 days a week*
also BBC/CBM/ORIC and PERIHERALS

MICRO-SERV
95 Deerdykes View
Westfield Industrial Estate
Cumbernauld
Tel: Cumbernauld 02367 37110
Trade, schools and club discount given.
27PL442A

TOSHIBA PRINTER MSX HXP550 3 months old £185.00 ono, Thomson Colour Monitor for Atari ST 2 months old £335. Telephone Adrian (0474) 60495.

FOR SALE

MUSIC!! on your Spectrum!! in 2 channels including Top 20 hits for 4 pounds including tape. Send to Distance Sounds, 187 Lymington Ave, Wood Green, London N22 6JL.

INSIGHT
The Adventurers Companian £1.
Monthly handbook packed with hints, tips, maps and solutions. A must for every adventurer. Issue 5 available now. Cheque/PO
R. DAWSON 41 Union Court, Otley, West Yorks. LS21 3AS.
27PL07

66% OFF PRINTER RIBBONS
Why pay £££s for a *new* fabric ribbon cassette when we can re-ink your old one at a THIRD OF THE PRICE?
Post cassette, stating printer make and model and enclosing one third of the price of a new one (minimum £1), to:
ALADDINK, (Dept. PC),
4 Hurkur Crescent, Eyemouth, Berwickshire TD14 5AP 27PL01

DISKS
5¼" DISKS
10 for £8 inc plastic case inc P&P
3½" DISCS
10 SS/DD £25.00
10 DS/DD £30.00
RING US NOW (0793) 695034. UK HOME COMPUTERS, 82 CHURCHWARD AVENUE, SWINDON, WILTS SN2 1NH 23PLUK1

YOUR PERSONAL CENTRONICS PRINTER

£99 plus vat
plus £8 p+p

- *DRAFT MATRIX PRINT*
- *NEAR LETTER QUALITY*
- *SUBSCRIPT SUPERSCRIPT*
- *CONDENSE EMPHASIZE*
- *96 CHAR+48 EURO+16 MATHS*
- *GRAPHICS*
- *OPTIONAL TRACTOR*

128 Station Rd Glenfield Leicester LE3 8BR

ROCK HALL
TEL: (0533) 313531

COMPUTER SWAP

Computer Swap entries are limited to 30 words. All entries cost £2.50. Please enclose a cheque or postal order or give Access or Barclaycard No in the box provided. Only text appearing in the grid will be printed. Send the form to: Computer Swap. *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

PLEASE NOTE All software offered through computer swap must be in original condition and for private sale only. No advertisements for lists of software will be accepted.

It cannot be swapped.
Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

Please write your copy in capital letters on the lines below.

Name .....

Address .....

..... **Telephone** .....

☐ *Please charge my Visa/Access card no:*

BLANK CASSETTES

WITH LIBRARY CASES

	C10	C15	C20	C30
10	3.60	4.00	4.15	4.60
20	7.00	7.20	7.40	8.20
50	15.00	15.20	15.90	17.50
100	27.00	28.00	29.00	33.00

Fully Inclusive (COD 65p extra)

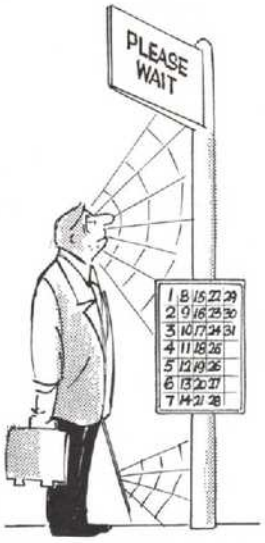
Superior Tapes. Don't Settle for Less!

RING US NOW! (0793) 695034
UK HOME COMPUTERS, 82 CHURCHWARD AVE, SWINDON, WILTS SN2 1NH 23PLUK2

AMSTRAD PCW owners. Specially written for the 8256. Alphadelta, Alphbetical, Datastore. Organises Notes, Ideas, memoranda, plus many print/edit features, on 3 inch disc £9.45 from Soundout Services. 25 Castlereach St, London W1H 5YR.

STREET PATROLLER. Text Adventure for 1.20 BBC, contains over 200 locations, plenty of chained puzzles and separate help program. Only £4 to: Central Computing, 61 Beech Road, G1U WA9, Tamworth, Staffs, B79 8QQ.

YOU DON'T NEED TO WAIT ALL MONTH TO ADVERTISE IN:



POPULAR Computing WEEKLY

Call **01-437 4343** for details

HA1B

COMPUTER CABLES

25 Way/RS232 extension cable. 10 ft/3 metre cable, male to female, will extend any currently working device on your system. But one new, you never know when you may require at, £19.95. P + P add £1. Send cheque/PO to **Computacable(P), 20 Hazelwood Avenue, Harwood, Bolton, Lancs BL2 3NR.** 26PL16

VELDA PUBLISHING

THE SPECIALISTS PRODUCTING THE CLEAREST ENGLISH W.P. GUIDES

LOCOSCRIPT WORDSTAR NEWWORD CARDBOX
French & Dutch language versions of Locoscript also available
all at £5.00 each (thousands sold)
Printed or Audio versions same price

1 LANDSEER ROAD, WESTBOURNE BOURNEMOUTH, DORSET BH4 9EH
Telephone **020 762401** *27PL2*

DISCS

AMSOFT 3" CF2	£33.00 PER 10
AMSOFT 3" CF2DD	£59.50 PER 10
AMSOFT 3" CF2	£17.35 PER 5
SONY 3½" D3440	£26.25 PER 10
SONY 3½" D4440	£35.12 PER 10
MAXEL 5¼" MD2D	£17.90 PER 10
ATHANA 5½"	£10.90 PER 10
DMP 2000 PRINTER	£139

PACK & POST INC. ADD 15% VAT 26PL2

RUGBY MICRO SPARES
30 OXFORD ST RUGBY
CV21 3NF. (0788) 71643
Callers welcome by App.

COMPUTER HIRE

TO HIRE A COMPUTER AND/OR PERIPHERALS BY THE WEEK OR MONTH RING 01-607 0157 or 01-997 6457 WE SPECIALISE IN BBC AND ALSO HAVE A RANGE OF AMSTRAD COMUTERS FOR HIRE
COMPUTER HIRE SERVICES, 294A CALEDONIAN RD, LONDON N1 1BA. 23PL17

AMSTRAD or SPECTRUM

For Amstrad 464/664/6128 or Spectrums. TAPE TIDY. A new Database program for holding record of ALL your tapes (can hold up to 1000 records and can find any one in under a second). Alpha sorts and can print out to ANY printer. Even auto transfers itself to Disc (or to a Microdrive) if required. Supplied with full instructions. State if an Amstrad or Spectrum and send just £5.95.

G. Bobker, ZX-GUARANTEED, 29 Chadderton Drive, Unsworth, Bury, Lancs. BL9 8NL

MEMOTECH COMPUTERS

AND ACCESSORIES

MICROVITEC V53 COLOUR MONITOR	£249.00
MTX 512 COMPUTER	£95.00
DMX 80 PRINTER	£175.00
RS232	£35.00
1MB DISK DRIVE & INTERFACE	£210.00
NEWWORD ROM	£35.00
PASCAL ROM	£35.00
SPECULATOR ROM	£35.00

All the above prices are fully inclusive. We stock the entire Memotech Range. Orders/Enquiries to:

UK HOME COMPUTERS
82 CHURCHWARD AVE SWINDON, WILTS. SN2 1NH
24-hr Phone Service 0793-695034 PL27

AMSTRAD TAPE TO DISC

DISCIT is an amazing new system for transferring tape to disc. VERY cunning programming lets it insert itself right into the disc operating system. (Totally HANDS OFF in use!) We can't promise it will deal with everything, but no known failures so far. Price of £10.95 includes 3 months membership of CAMELCLUB.

SPECIAL OFFER

£5 trade-in given on any commercial tape-disc utility (must be original) when purchasing DISCIT. No better time to upgrade!

Cheques/P.O.'s to:
CAMEL MICROS, Wellpark, Willeys Ave., EXETER, Devon EX2 8BE. Tel: (0392) 211892

ARE YOU IN A RUT?

your micro with step-by-step courses for any age or interest.
Amstrad-Spectrum-BBC
Commodore-Atari
For **FREE** Guide and **FREE** Book 'Computer Toolbox'
Write **-NO STAMP REQUIRED-** To

MICROWISE
FREEPOST, Colchester, C03 4BR
Tel: 0205 575718 9am-8pm
27PL05

STAR CRASH. The new survival simulation. More than just an adventure. See Tony Bridge Adventure Corner (PCW) June 19th. 'Mandatory Fair for Spectrum Owners'. £4.95 inc. p&p. From Starcrash Software Systems, 1 Walsingham Avenue, Manchester, M20 8WA.

DRAGON USER

To make the most of your Dragon you need **Dragon User** — the independent magazine for Dragon owners. To make sure that you receive a copy of Dragon User regularly subscribe direct to us. A year's subscription costs £14 for 12 issues (overseas rates available on application). Send a cheque or postal order made payable to Dragon User, and accompanied by your name and address, to Dragon User, Subscription Department, Oakfield House, Perrymount Road, Haywards Heath, Sussex RH16 3DH. PL32

HINTS - POKES - MAPS

"Stunning Value" — Tony Bridge, Popular Computing Weekly

The monthly handbooks, packed with Tips, Pokes, Hints, Maps, Solutions, Gossip, Latest Reviews, Competitions, plus much more

Adventures Handbook (CBM/SPC	£1
C16/Plus 4 Handbook	£1
Amstrad Handbook	£1
BBC Handbook	£1
Commodore (64/128) Arcade Handbook	£1
Spectrum (48/128) Arcade Handbook	£1

or for even better value take advantage of our reduced subscription rates. – 3 issues £2.75, 6 issues £5.00, 12 issues £9.00 Send Cheque or P.O. to:

21PL10
H&D SERVICES (PCW)
1338 Ashton Old Road, Higher Openshaw
Manchester M11 1JG Tel: 061-370 5666

AVAILABLE NOW!

AMSTRAD 128	£465
AMSTRAD PCW 8256	£435
AMSTRAD CPC 6128 (C)	£375

Many others & peripherals available all at discount (phone for quote)
Prices inc. VAT + Postage.
Cheques to:

WILLOW SOFTWARE (PCW)
The Willows,
Wrington Lane,
Congresbury,
Bristol BS19 5BQ
Tele: (0934) 834056 27PL9

FOR COST-EFFECTIVE ADVERTISING CALL RODNEY WOODLEY 01-437 4343

HA17B

There's a Dealer near you . . .

BIRMINGHAM

D.G. MICROTEK ELECTRONICS
190B DUDLEY ROAD
WINSON GREEN
BIRMINGHAM
Tel: (021) 454 4697
PL644

ESSEX

ESTUARY PERSONAL COMPUTERS

318 CHARTWELL NORTH
VICTORIA CIRCUS SHOPPING CENTRE
SOUTHEND ON SEA
Tel: (0702) 614131
PL484

CAREY ELECTRONICS
FOR
THE BBC MICROCOMPUTER
SYSTEM
COMPUTERS AND SOFTWARE,
PERIPHERALS.
7 CHURCH ROAD
WALTON-ON-NAZE, ESSEX
FRINTON-ON-SEA (02556) 6993
9am-9pm
PL644A

H REYNOLDS
79 ORSETT ROAD
GRAYS, ESSEX
Tel: (0375) 375948
PL901

MIKES COMPUTER STORE
292 LONDON ROAD
WESTCLIFF-ON-SEA
ESSEX
Tel: (0702) 332554
PL905

ATARI
520 STM
£399

communication Plus+ INCORPORATING MICRO-MEND

5 HONEYWOOD ROAD
(Off Cranes Farm Rd)
BASILDON
Tel: (0268) 21818
PL802A

communication Plus+ INCORPORATING MICRO-MEND

c/o KEDDIES
(second floor)
HIGH STREET
SOUTHEND
Tel: (0702) 62426
PL802

NOBLES
14-17 EASTERN
ESPLANADE
SOUTHEND-ON-SEA,
ESSEX
Tel: (0702) 63377/8
PL900

GLASGOW

THE COMPUTER DEPOT
205 BUCHANAN STREET
GLASGOW G1 2JZ
Tel: (041) 332 3944
PL705

HEREFORDSHIRE

HONEYSETT COMPUTERS
17 UNION STREET
HEREFORD HR1 2BT
Tel: (0432) 279404
ASK ABOUT
CLUNKER SALE
PL624

HUMBERSIDE

THE COMPUTER CENTRE
(HUMBERSIDE)
26 ANLABY ROAD
HULL
NORTH HUMBERSIDE
0482 26297
PL493

KENT

ANIROG COMPUTERS
29 West Hill
Dartford
Kent
Tel: (0322) 91649
PL454

dgh software centre

10 NORTH STREET,
ASHFORD, KENT
Tel: (0233) 32597
PL680

MICROWAY COMPUTERS
39 HIGH STREET
RAINHAM, KENT
Tel: (0634) 376702
PL512

MIDDLESEX

INNOVATIONS
COMPUTER & VIDEO
9 HARMONDSWORTH ROAD
WEST DRAYTON
MIDDLESEX UB7 9JS
Tel: (0895) 420457
PL910

LEEDS

MICROPOWER
NORTHWOOD HOUSE
NORTH STREET
LEEDS LS7 2AA
Tel: (0532) 458800
PL683

LEICESTERSHIRE

DIMENSION COMPUTERS LTD
27-29 HIGH STREET
LEICESTER
Tel: (0533) 57479
PL940

LONDON

LOGIC SALES
19 THE BROADWAY
THE BOURNE, SOUTHGATE
LONDON N14
Tel: 01-882 4942
PL896

GALARY SOFTWARE
1st FLOOR
THE ARNDALE CENT,
WANDSWORTH,
LONDON SW18
27PL29

VIC ODDENS
6 LONDON BRIDGE WALK
LONDON SE1
Tel: 01-403 1988
PL488

SOFTWARE STORE LTD
35 LONDON ROAD
LONDON SW17
Tel: 01-685 1476
PL685

GAMES WORLD
129 KING STREET
HAMMERSMITH
LONDON W6
Tel: 01-741 4467
PL516

SURREY

ULTIMA
UNIT 28
WHITE LION WALK
GUILDFORD
(0483) 506939
26PL802a

SUSSEX

GATWICK COMPUTERS
62 THE BOULEVARD
CRAWLEY, SUSSEX
Tel: (0293) 26240/37842
PL912

There's a Dealer near you . . .

SUFFOLK

FOR MSX, SPECTRUM, COMMODORE, AMSTRAD
PL901B

Sudbury Micro Systems
Computer Retail & Consultancy

64 NORTH STREET
SUDBURY
TEL: SUDBURY 311839

STAFFORDSHIRE

MICROTRONICS
27a MARKET STREET
TAMWORTH, STAFFS
Tel: (0827) 51480
PL911

TELEX YOUR CLASSIFIED COPY TO:
296275
SUNRGY
HAS

HOME SOFT COMPUTING
1st FLOOR
81A BOLEBRIDGE ST
TAMWORTH
STAFFS
(0827) 63549
PL911A

YORKSHIRE

YORK COMPUTER CENTRE
7 STONEGATE ARCADE
YORK
Tel: (0904) 641862
PL915

WALES

MAPPLE MICRO ASSOCIATES
FREEPOST
PO BOX 17
CWMBRAN
GWENT NP44 3YT
PL646

POSITRON COMPUTING
15 CENTRAL PRECINCT
LLANELLI
SAE15 1YE
0554 759624

AMSTRAD 8256
UPGRADE
24PL20

FOR POWERFUL DEALER ADVERTISING CALL RODNEY WOODLEY on 01-437 4343

WARWICKSHIRE

FAST FORWARD COMPUTER STORE
29 SMITH STREET
WARWICK
Tel: (0926) 492004
PL845

NORFOLK

THETFORD MICROS
SPECIALISTS –
COMPUTER REPAIRS
21 GUILDHALL STREET
THETFORD
NORFOLK
(0842) 61645
PL912A

DUPLICATION

FAST reliable service of DATA DUPLICATION for most computers. Comprehensive facilities include: erasure/re-recording; blank discs/cassettes; blank or printed labels/inlays. COMPETITIVE PRICE-LIST from:-

SIMON STABLE PROMOTIONS
CASSETTE DUPLICATION

The Knightsbridge Stables, 20 West End
Lavette Oxon OX8 6DF. Tel: 0869 25 2831

VAT No. 339 3222 79

22PL395

For Small Software Houses
CASSETTE DUPLICATION
50-1,000 load tested
Copyright holders only
SOUNDS GOOD
04946 (Beaconsfield) 5900

jbs records
COMPUTER PROGRAMS
REAL-TIME or (Slow) HIGH SPEED professional Cassette Duplication and Blanks 1 to 1,000 +. Computer printed cassette labels. BBC Disk copying 1 to 500 +. Fast Security Delivery Service.
jbs records—a division of FILTERBOND LTD.
19 Sadlers Way, Hertford SG14 2DZ.
0992 551188
PL397

COMPUTER SWAP

ATARI 520T, complete monochrome packages as new. 1 Megabite Disk Drive. Usually £799 will sell for £750 ono. Penrith 63915.

SPECTRUM PLUS, Interface I, Microdrive with nine cartridges and Prism VTX 5000 modem. All in working order £130. Tel: (0285) 860342.

QUILL OWNERS! Write and sell your adventures. Contact other writers. Share problems, ideas, opinions. Keep in touch with markets. Sample Magazine 50p from: Adventure Contact, 13 Hollington Way, Wigan, WN3 6LS.

AMSTRAD tape to disc, media transfer issue 1+2 and oldie transfer only £4 for all three send to D. Baxter, 42 Mount Stewart Street, Carluke, Lanarkshire, Scotland, ML8 5EB.

C16/PLUS 4. Send SAE for details of the first User Club for your computer! Don't miss out! Send SAE to David Baxter, 42 Mount Stewart Street, Carluke, Lanarkshire, Scotland, ML8 5EB.

SPECTRUM. Perfect, original condition – Interface 1, microdrive, 65 old magazines, Kempstron joystick interface (amplifies sound), 2 books, 14 quality programs, fast sale £100. Telephone Ray Copeland, weekdays except Wednesday 6pm +, 061-798-6375.

ADVENTURE PROBE. Writing, solving or stuck? This is the magazine for you! SAE for details or £1 for sample copy. Pat Winstanley, 13 Hollington Way, Wigan, Lancs WN3 6LS.

AMSTRAD 6128 Home Study Course covering computer applications, programming CP/M, Basic, Text and Graphics. Suitable for any age. With books, notes and discs. Un-needed gift. Bargain £89. Telephone 0206 575718.

COLOUR GENIE, software, manual, book, £50 ono. CPC 464 modulator. £7.50. CPC464 software: Dark Star, Blagger, Starion, Marsport, Return to Eden, Dungeon Adventure £5 each. Locomotion, Nonterraqueous £1 each. Tel: Lymm 2507.

SPECTRUM Plus data recorder, light pen, two joysticks and interfaces, all in carrying case, too much software to list £100 ono. Phone John 01-353 0588 daytime.

ADVENTURE MAPS/Solutions "Price Magik", £1.00; "Very Big Cave", £1.00, "Valkyrie 17", 75p; "Bored of Rings", 75p. Many more. SAE for list. J. R. Barnsley, 32 Merrivale Road, Stafford, Staffs. ST17 9EB.

COMMODORE 64, cassette, joystick, £350 worth software including, Spindizzy, Starquake, Fist, Int Karate, Winter Games, V and many more, also with Computer Desk £199 ono. Tel: 0630 57129.

AMSTRAD CPC6128 Colour Monitor, Master File 6128, Tasword 6128, lots of disc software, EG Working Backwards, Defend or Die, Alien 8 + 10 blank discs +cassette lead, +cassette software. All in brand new condition only £375. Ring Mik 0532 869425.

SPECTRUM CENTRONICS 'E' Interface £25, C64 Centronics or Parallel Interface £20, Electron Centronics Interface £20, wanted broken C64 or Spectrum for spares – cash paid. Phone: Mark on 01-552 4263.

WANTED 512K expansion for Sinclair QL. Must be cheap for a student. All types considered. Write to Nigel Kennett, 'Springlea', Micklefield Lane, Rawdon, Leeds LS19 6BA.

AMSTRAD SOFTWARE. Original condition. Alien-8, Warlord, T.S.A.M., Spellbound, MAT-2, Fourmost Adventures, Message Adromeda, F.A.W.E., Wild Bunch, Short's Fuse, Al—Strad, Casiopia. New £60+. Sell £30 o.n.o. D. Oya, 24 Kingsway, Banbury, Oxon.

GAC owners! Write and sell your adventures. Contact other writers. Share problems, ideas, opinions. Keep in touch with markets. Sample Magazine 50p from : Adventure Contact, 13 Hollington Way, Wigan, WN3 6LS.

INTERFACE ONE and microdrive with eighty cartridges (for 48K Spectrum). £95 ono. Tele. 01-572 2917.

C64 software new includes Casino King/Minz. £2 each. Phone: 01-470-4427. Write 73 Wakefield St, East Ham, London E6 1NR.

EPSON PRINTER MX.80f/t very little used. £100 Phone 04252-78524 (near Christchurch, Dorset)

AMSTRAD monochrome colour modulator DK'Tronics speech synthesiser, joystick and £150 + software only £180. Tel: 061-793 0860 office hours, will deliver in Manchester area.

QL JM Rom, Psion 2.3 ICE rom plus Artice Software, Sanyo green screen monitor, Seikosha GP100 MkII printer, joystick interface, machine code books and QL user magazines £200 Tel: 01-521 1058.

INTERFACE ONE and Microdrive, expansion system, RS232 printer lead and two books. All in mint condition, £65 no time wasters no offers, first call secures. Tel: 091 4568473 Paul.

New Releases

John Cook looks through this week's new arrivals

Amstrad

Program *Monsters of Murdach* **Type** Text Adventure **Micro** Amstrad CPC **Price** £7.95 (tape) £14.95 (disc) **Supplier** Global Software, PO Box 67, London SW11 1BS.

Program *Monsters of Murdach* **Type** Text Adventure **Micro** PCW 8256/8512 **Price** £19.95 **Supplier** Global Software, PO Box 67, London SW11 1BS.

Program *Harvey Headbanger* **Type** Arcade **Micro** Amstrad CPC **Price** £1.99 **Supplier** Firebird Software, Wellington House, Upper St Martins Lane, London WC2.

Program *Knight Games* **Type** Arcade **Micro** Amstrad CPC **Price** £8.95 (tape) £14.95 (disc) **Supplier** English Software, 1 North Parade, Parsonage Gardens, Manchester, M60 1BX.

Program *Amstrad Shuffle* **Type** Strategy **Micro** Amstrad CPC **Price** £4.95 **Supplier** Alpha Omega, 9 Kings Yard, Carpenters Rd, London E15.

Program *Instant Access* **Type** Utility **Micro** Amstrad CPC **Price** £29.95 **Supplier** Minerva Systems, 69 Sidwell St, Exeter, Devon, EX4 6PH.

Program *Random Database* **Type** Utility **Micro** Amstrad CPC **Price** £39.95 **Supplier** Minerva Systems, 69 Sidwell St, Exeter, Devon, EX4 6PH.

Program *First Base* **Type** Utility **Micro** PCW 8256/8512 **Price** £29.95 **Supplier** Minerva Systems, 69 Sidwell St, Exeter, Devon, EX4 6PH.

Atari ST

Program *Atari DB Calc* **Type** Utility **Micro** Atari ST **Price** £??.?? **Supplier** Robtek, Unit 4, Isleworth Business Complex, St Johns Road, Isleworth, Middx, TW7 6NL.

Program *Cards* **Type** Strategy **Micro** Atari ST **Price** £19.95 **Supplier** Microdeal, PO Box 68, St Austell, Cornwall, PL25 4YB.

I quote, *'Cards* offers a refreshing break from arcade-style games . . .' I can remember getting the same sinking feeling when a company representative once intimated of his game, 'I think people are getting tired of good graphics and sound.'

Still, Microdeal do deserve some credit for getting hold of great quantities of American ST software (all written by Michtron so far) and bringing it over to the UK – even if this blunderbuss approach is sometimes off the mark.

Cards will grab hold of your 68000 based, state-of-the-art machine and allow you to play Solitaire, Klondike, Poker Squares and Cribbage (against the computer or by yourself as applicable) or play Blackjack (Pontoon) with up to four others against the machine. The graphics are satisfactory and it's nice to see that full use is mad of the mouse for selecting options, cards, etc.

Two things count heavily against the package – explanation of the rules are minimal and the thing doesn't play poker. An American selection of card games that doesn't include Poker! The Moral Majority have got a lot to answer for – I can see Doc Holliday turning in his grave. For ST greenhorns only I would say – whatever – it's to be played with the boots firmly off.

Pick of the week

Leader Board

Program *Leader Board* **Type** Arcade/Strategy **Micro** CBM 64 **Price** £9.95 (tape) £14.95 (disc) **Supplier** US Gold, Unit 10, The Parkway Industrial Centre, Heneage St, Birmingham B7 4LY.

It's been an above par season for golf games – recently the creditable *Golf Construction Set* (reputedly coded by Hungarian programmers who had never even set eyes on a golf course), now topped by *Leader Board* from US Gold.

I'd be surprised if none of the American Access team played golf – it's a surburban obsession over there. And that obsession has shown itself up in the accuracy of the simulation and the atmosphere of tension and excitement that *Leader Board* can create.

Without going into the finer details of the controls (for that see the full review next week) the game manages to combine playability with a crucial need for intense concentration and timing.

Like the real game, sloppiness is punished severely, as the smallest hint of slice or hook can send your ball whizzing off into the water. Water? Yes; water (and the excellent sound effect that accompanies its demise into the deep) will become an all too familiar companion on the way round this particular golf course, as it seems to be played mainly on a series of islands. Think of Wentworth flooded up to depth of about five feet and you've got the idea.

Up to four players (the more the better) can battle it out over four 18-hole courses – and there's no denying that this is by far the best golfing simulation to date. Access have succeeded in capturing the claustrophobic, coiled excitement that attracts the crowds.

Of course, it's not going to improve your handicap any, but if you want to know what it feels like walking into the 18th green with $100,000 riding on a fifty foot putt – this is the closest most of us are going to get.

Program *Introduction to Logo on the Atari ST* **Type** Educational **Micro** Atari ST **Price** £19.95 **Supplier** Microdeal, PO Box 68, St Austell, Cornwall, PL25 4YB.

BBC B/Electron

Program *AMX Zap Zone* **Type** Arcade **Micro** BBC B **Price** £4.95 **Supplier** AMS 166-70 Wilderspool Causeway, Warrington, WA4 6QA.

Program *AMX Mind Games* **Type** Strategy/Educational **Micro** BBC B **Price** £14.95 (disc) **Supplier** AMS 166-70 Wilderspool Causeway, Warrington, WA4 6QA.

Program *Thrust* **Type** Arcade **Micro** BBC B/Electron **Price** £7.95 (tape) £11.95 (disc) **Supplier** Superior Softweare, Dept TH1, Regent House, Skinner Lane, Leeds, LS7 1AX.

Program *AMX Pagemaker* **Type** Utility **Micro** BBC B **Price** £??.?? **Supplier** AMS, Wilderspool Causeway, Warrington, WA4 6QA.

C16/Plus 4

Program *C16 Greatest Hits* **Type** Compilation **Micro** C16 **Price** £7.95 **Supplier** Melbourne House, 60 High St, Hampton Wick, Kingston upon Thames, Surrey, KT1 4DB.

Program *Booty* **Type** Arcade **Micro** C16/Plus 4 **Price** £1.99 **Supplier** Firebird Software, Wellington House, Upper St, Martins Lane, London WC2.

CBM 64

Program *Floyd the Droid* **Type** Arcade/Strategy **Micro** CBM 64 **Price** £9.95 **Supplier** Ariolasoft UK, 68 Long Acre, Convent Garden, London WC2E 9JH.

Program *Databasis* **Type** Utility **Micro** CBM 64 **Price** £9.95 **Supplier** Ariolasoft UK, 68 Long Acre, Convent Garden, London WC2E 9JH.

Program *Maps (Britain)* **Type** Educational **Micro** CBM 64 **Price** £6.95 **Supplier** Ariolasoft UK, 68 Long Acre, Convent Garden, London WC2E 9JH.

It's a pity that so much educational software that passes through seems to be of the simple question/answer multiple choice variety, without using the computer more imaginatively. At least it does make the exceptions stand out more – such as *Maps Britain*.

What you have here is essentially a program that will teach a child the basic place name geography of the United Kingdom (and Eire) without tears.

Its best feature is a game which has you flying a helicopter over a scrolling map of the

UK. You are asked to visit a series of locations within a strict time limit – the problem is that the map does not contain place names and only marks the very major cities. (You are given a clue in that your target location will flash if you pass very near it. The more locations you get to (identify) the more points you get – and if you visit enough, extra time is added, but now the place names are more obscure. (Where the hell is Milford Haven anyway?)

Such competition is ideal carrot and stick fodder to get anyone studying their atlas. Other features are a search facility (which will look for any particular town you enter and display it on the map if it is in the program's database) and a straightforward quiz section, which will point to an area and ask what county it is, for example.

I wasn't too impressed with the latter – any program that rejects 'Devon' as an answer, when what it wanted was 'Devonshire' cannot be said to be without fault – nevertheless, for the helicopter game alone, this is excellent education amusement.

Program *Touchdown Football* **Type** Arcade **Micro** CBM 64 **Price** £9.95 (tape) £14.95 (disc) **Supplier** Ariolasoft UK, 68 Long Acre, Convent Garden, London WC2E 9JH.

Program *Murder on the Mississippi* **Type** Adventure **Micro** CBM 64 **Price** £14.99 (disc only) **Supplier** Activision, Activision House, 23 Pond St, London NW3.

Program *Speed King* **Type** Arcade **Micro** CBM 64 **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul St, London EC2.

Program *Ninja Master* **Type** Arcade **Micro** CBM 64 **Price** £1.99 **Supplier** Firebird Software, Wellington House, Upper St Martins Lane, London WC2.

Program *Knight Games* **Type** Arcade **Micro** Commodore 64 **Price** £8.95 (tape) £12.95 (disc) **Supplier** English Software, 1 North parade, Parsonage Gardens, Manchester, M60 1BX.

MSX

Program *Scrabble* **Type** Strategy **Micro** MSX **Price** £9.95 **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Rd, London W11 2DX.

PCW 8256/8512

Program *Monsters of Murdac* **Type** Text Adventure **Micro** PCW 8256/8512 **Price** £19.95 **Supplier** Global Software, PO Box 67, London SW11 1BS.

Program *Monopoly* **Type** Strategy **Micro** MSX **Price** £9.95 **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Rd, London W11 2DX.

Program *Cluedo* **Type** Strategy **Micro** MSX **Price** £9.95 **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Rd, London W11 2DX.

Program *First Bass* **Type** Utility **Micro** PCW 8256/8512 **Price** £29.95 **Supplier** Minerva Systems, 69 Sidwell st, Exeter, Devon, EX4 6PH.

Spectrum

Program *Crimble* **Type** Adventure **Micro** Spectrum **Price** £2.20 **Supplier** MicroTech, 88 Whitley Spring Cres, Ossett, W Yorks, WF5 0RF.

Program *2001½: A Space Idiot* **Type** Adventure **Micro** Spectrum **Price** £2.20 **Supplier** MicroTech, 88 Whitley Spring Cres, Ossett, W Yorks, WF5 0RF.

Program *Rebel Star* **Type** Strategy **Micro** Spectrum **Price** £1.99 **Supplier** Firebird Software, Wellington House, Upper St Martins Lane, London WC2.

You don't expect to see strategy games turning up on a budget label as a rule - but in the latest batch of releases from Firebird lurks one such beast – *Rebel Star*. Played as a one or two player game (in the one player version, the Spectrum gets to play the defenders) it depicts the assault on Moonbase Delta by a mixed bunch of Rebels and

assorted droids, while the defenders (mainly droids) do their best to keep Kurt Levine and his pals out.

Each player takes his turn to move all, some or none of his forces on a scrolling playing area about six screens by three. All activity, ie, movement, combat, using objects takes a certain number of 'Action Points' – and when a piece has used up all of its action points for that turn, it's on to the next one – a concept familiar to most wargamers.

Overall, there's more to it than originally meets the eye. It's obviously been carefully programmed – and despite the less than impressive graphic display, lovers of computer wargames are unlikely to find they have wasted £1.99 on this one.

Program *Conquest* **Type** Arcade **Micro** Spectrum **Price** £2.99 **Supplier** mastertronic, 8-10 Paul St, London EC2.

Program *Poster Machine* **Type** Utility **Micro** Spectrum **Price** £5.95 **Supplier** Softcat, PO Box79, Macclesfield, Cheshire, SK10 3NJ.

Program *Posh-List* **Type** Utility **Micro** Spectrum **Price** £2.95 **Supplier** Deltarho Software, 12 Ennersdale Rd, London SE13 6JD.

QL

Program *Peintre* **Type** Utility **Micro** QL **Price** £14.95 **Supplier** Reo Promotions, 28 Waverley Grove, London N3 3PX.

Program *Nucleon* **Type** Utility **Micro** QL **Price** £19.95 **Supplier** Reo Promotions, 28 Waverley Grove, London N3 3PX.

Charts

Top Twenty

1	(2)	Ghosts and Goblins	Elite
2	(1)	Green Beret	Imegine
3	(18)	Ninja Master	Firebird
4	(4)	Kik Start	Mastertronic
5	(5)	Formula One Simulator	Mastertronic
6	(3)	World Cup Carnival	US Gold
7	(16)	Kane	Mastertronic
8	(8)	Way of the Tiger	Gremlin Graphics
9	(13)	Commando	Elite
10	(6)	Street Olympics	Mastertronic

Ninja

Biggles

11	(7)	Biggles	Mirrorsoft
12	(–)	Molecule Man	Mastertronic
13	(14)	Last V8	Mastertronic
14	(–)	They Sold (2)	Hit Squad
15	(12)	Knight Tyme	Mastertronic
16	(–)	Heavy On the Magik *(Spectrum)*	Gargoyle Games
17	(9)	Silent Service	Microprose/US Gold
18	(–)	Booty	Firebird
19	(10)	Fingers Malone	Mastertronic
20	(11)	Thrust	Firebird

Top Tens

Commando

All figures compiled by Gallup/Microscope

Amstrad

1	(2)	Kane	(Mastertronic)
2	(3)	Green Beret	(Imagine)
3	(NE)	Harvey Headbaner	(Firebird)
4	(5)	Kung Fu Master	(US Gold)
5	(–)	Tomahawk	(Digital Integration)
6	(–)	Heavy on the Magick	(G Games)
7	(6)	Radzone	(Mastertronic)
8	(–)	Bounder	(Gremlin Graphics)
9	(–)	Commando	(Elite)
10	(–)	Into Oblivion	(Mastertronic)

Commodore 64

1	(1)	Green Beret	(Imagine)
2	(–)	Ghosts and Goblins	(Elite)
3	(–)	Ninja Master	(Firebird)
4	(2)	Silent Service	(M'prose/Us Gold)
5	(3)	Thrust	(Firebird)
6	(5)	Bump Set Spike	(Mastertronic)
7	(–)	Slamball	(Americana)
8	(–)	International Karate	(System 3)
9	(9)	World Cup Carnival	(US Gold)
10	(10)	Formula One Simulator	(M'tronic)

Atari

1	(1)	Kik Start	(Mastertronic)
2	(–)	Last V8	(Mastertronic)
3	(3)	Vegas Jackpot	(Mastertronic)
4	(4)	Action Biker	(Mastertronic)
5	(7)	New York City	(Americana)
6	(9)	One Man and his Droid	(M'tronic)
7	(6)	Ollies Follies	(Americana)
8	(8)	Shamus	(Americana)
9	(–)	Cloak of Death	(Bugbyte)
10	(–)	Savage Pond	(Bugbyte)

BBC

1	(5)	Commando	(Elite)
2	(4)	Winter Olympics	(Tynesoft
3	(–)	Ian Botham T. Cricket	(Tynesoft)
4	(–)	Karate Combat	(Superior)
5	(–)	Phantom Combat	(Doctor Soft)
6	(–)	Mini Office 2	(Database)
7	(–)	Bruce Lee	(US Gold)
8	(3)	Star Force 7	(Bugbyte)
9	(–)	Jack Attack	(Bugbyte)
10	(1)	Tennis	(Bugbyte)

Spectrum

1	(1)	Ghosts and Goblins	(Elite)
2	(4)	Ninja Master	(Firebird)
3	(5)	Molecule Man	(Mastertronic)
4	(2)	Knight Tyme	(Mastertronic)
5	(6)	Green Beret	(Imagine)
6	(–)	Heavy on the Magik	(G Games)
7	(9)	Conquest	(Mastertronic)
8	(3)	World Cup Carnival	(US Gold)
9	(–)	Biggles	(Mirrorsoft)
10	(–)	Formula One Simulator	(M'tronic)

NEXT WEEK

The missing Amstrad supplement turns up at last including: Amstrad graphics. Full report of the recent Amstrad show. Profile of Amstrad stalwart CP Software.

● Go Forth

Continuing our series on alternatives to Basic, we look at one of the longest-established languages, Forth.

● PSS competition

The follow-up to Swords & Sorcery is coming. We give you a chance to make a contribution, get your name on the packaging and win some great prizes in the bargain.

● Plus

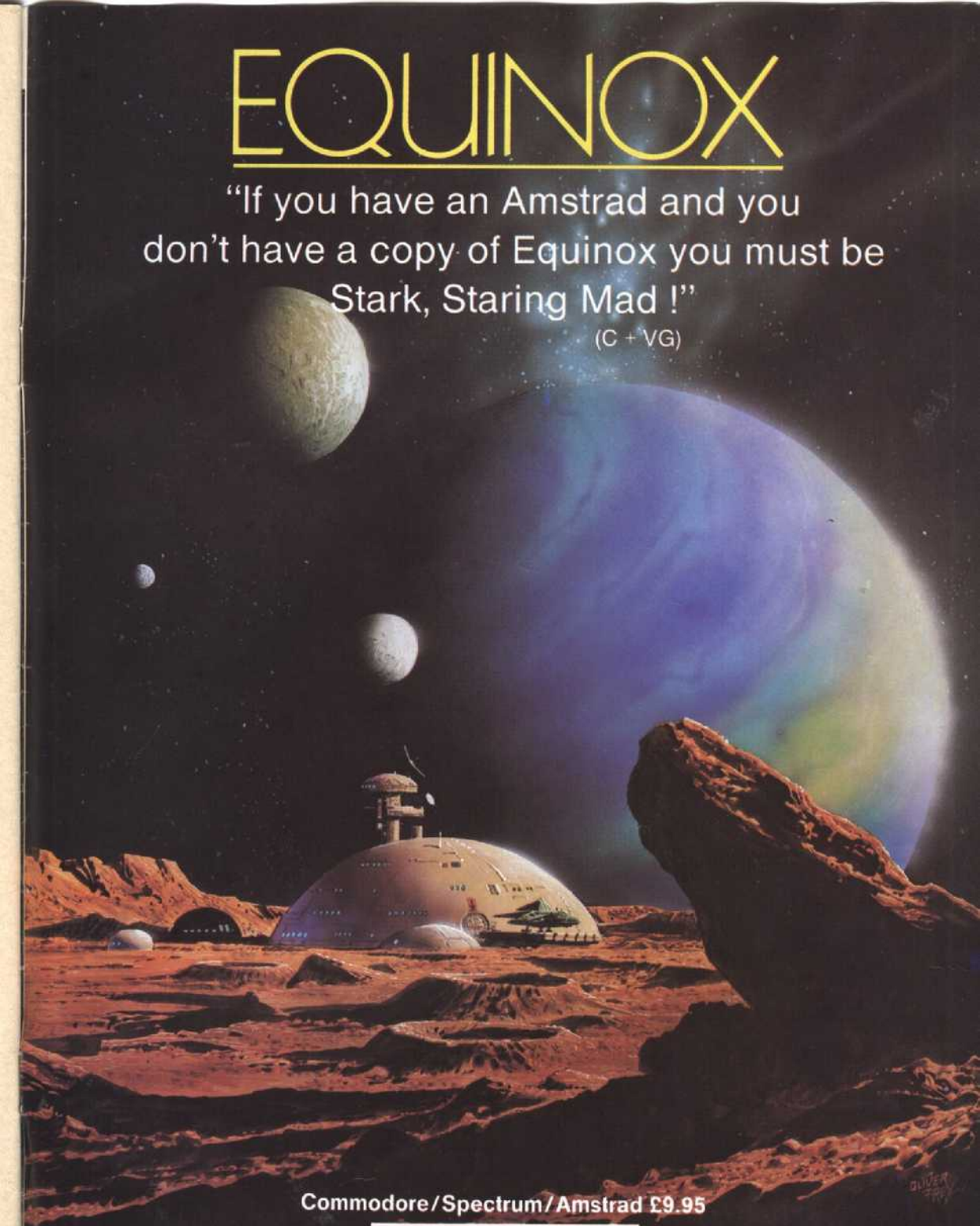
The hottest news in the business, the latest reviews and the regular crew of Messrs Bridge, Kendall, Jenkins et al.

The Hackers

EQUINOX

"If you have an Amstrad and you don't have a copy of Equinox you must be Stark, Staring Mad !"

(C + VG)



Commodore / Spectrum / Amstrad £9.95

MIKRO-GEN
Unit 15 The Western Centre
Western Road
Bracknell
Berks.

GET YOUR NAME ON THE LEADER BOARD

If you have ever bought another golf simulator – shoot yourself! If you are ever considering it – save yourself a bullet!
ZZAP64

Quite honestly, leaderboard makes all other golf simulations look clumsy and antiquated in comparison.
ZZAP64

This is the sports simulation of the year – if not the decade!
ZZAP64

GOLD MEDAL AWARD

TAPE £9.95
DISC £14.95

Practice Driving Range

Multiple 18 hole golf course

Amazing sound

The most realistic 3D golf simulation available

U.S. GOLD
All the American Software

And swing your way to a record round

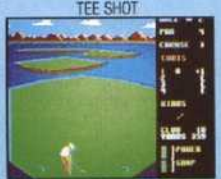
Now you can become a golf pro and experience the thrill of having your name up on the "Leaderboard". With this amazingly realistic simulation you get a true perspective view of your golf game. As you play on different 18 hole courses on levels varying from amateur to touring professional you'll need skill concentration and control to come in under par.

Features:
- Choice of club, distance, type of shot (hook, slice, putting) and more
- Realistic Sound
- Practice Driving Range
- Joystick Controlled
- Multiple 18 Hole Golf Courses
- Automatic Scoring

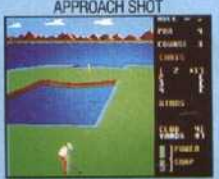
ACCESS Software Incorporated

CBM 64/128 Coming soon for Spectrum and Amstrad

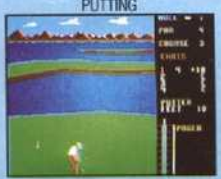
TEE SHOT



APPROACH SHOT



PUTTING



U. S. Gold, Unit 10, The Parkway Industrial Centre, Heneage Street, BIRMINGHAM B7 4LY. Tel. No. 021 3593020