June 5–11 1987 Vol 6 No 22 60p

POPULAR Computing WEEKLY

Amstrad launches new PC series at Comdex show

Details on page 6

SPECIAL supplement

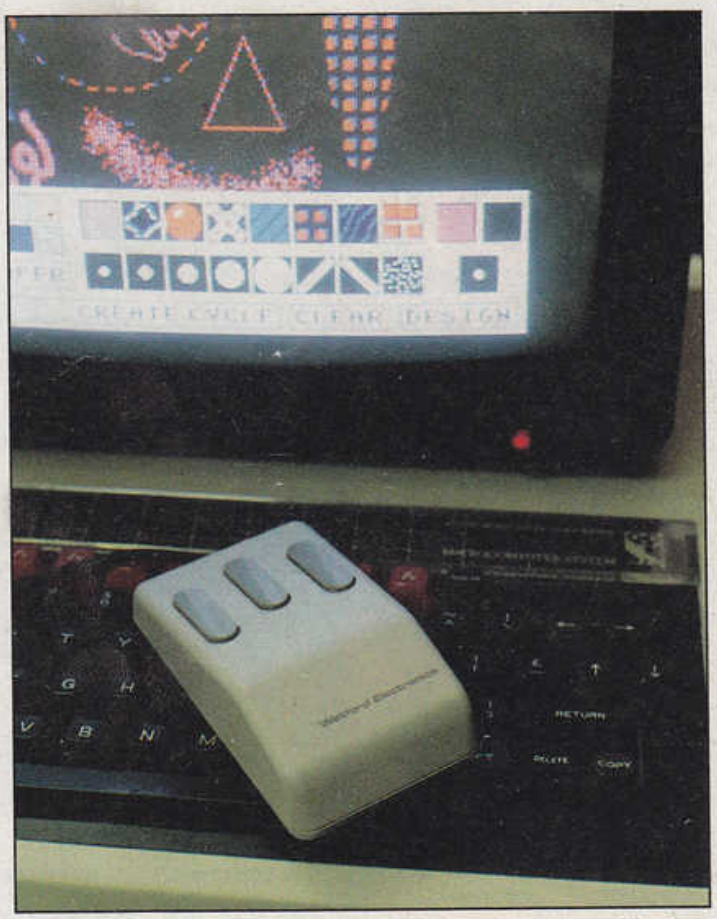
THE BBC MACHINES SPECIAL OFFER

Watford Electronics' mouse and software £10 off normal price

Turn your composite monitor into a TV

Take part in our Readers' Survey

250 prizes to be won



AV7300 TV tuner

Quest mouse and Paint software

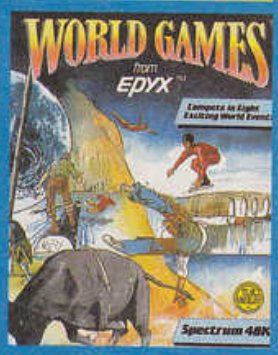
ATARI COMMODORE SPECTRUM

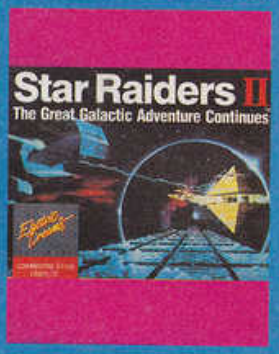
SPECTRUM COMMODORE AMSTRAD ATARI

WOOLWORTHS TOP 30 COMPUTER SOFTWARE

JUNE 1987

POSITION	TITLE	SOFTWARE HOUSE	MACHINE TYPE	PRICE
1.	6 Pack	Elite	Spectrum	9.95
2.	Enduro Racer	Activision	Spectrum	9.99
3.	6 Pack	Elite	C64	9.95
4.	World Games	U.S. Gold	Spectrum	8.99
5.	Star Raiders II	Electric Dreams	C64	9.99
6.	Saboteur 2	Durrell	Spectrum	7.95
7.	Auf Wiedersehen Monty	Gremlin	Spectrum	7.99
8.	Auf Wiederdehen Monty	Germlin	C64	9.99
9.	Sentinal	Firebird	Spectrum	9.95
10.	Nemesis Warlock	Martech	Spectrum	7.95
11.	Enduro Racer	Activision	C64	9.99
12.	Samurai Triology	Gremlin	C64	9.99
13.	Mag Max	Ocean	Spectrum	7.95
14.	Big 4	Durrell	C64	9.95
15.	Metrocross	U.S. Gold	Spectrum	8.99
16.	Enduro Racer	Activision	Amstrad	9.99
17.	Arkanoid	Ocean	C64	8.95
18.	Gauntlet	U.S. Gold	Spectrum	8.99
19.	Arkanoid	Ocean	Spectrum	7.95
20.	Gunship	Microprose	C64	14.95
21.	Army Moves	Ocean	Spectrum	7.95
22.	Konami Coin Op	Imagine	Spectrum	9.95
23.	Paperboy	Elite	Spectrum	7.95
24.	Leaderboard	U.S. Gold	Spectrum	9.95
25.	Metrocross	U.S. Gold	C64	9.99
26.	Konami Coin Op	Imagine	C64	9.95
27.	6 Pack	Elite	Amstrad	9.95
28.	Ranarama	Hewson	Spectrum	9.95
29.	5 Star Games Vol. 2	Beau-Jolly	Spectrum	9.95
30.	Paperboy	Elite	C64	9.95





WOOLWORTHS

A Great Deal in Entertainment

VISA

* At selected larger stores

* Items subject to availability

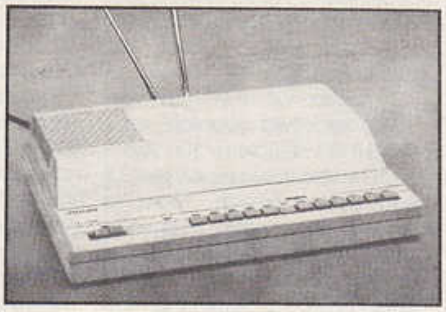
COMMODORE SPECTRUM AMSTRAD

ATARI COMMODORE SPECTRUM AMSTRAD

June 5–11

CONTENTS

POPULAR Computing WEEKLY



Top: The Philips AV7300 TV tuner. Above: screen from PMS's Genie desktop utility program. Below: Thing Bounces Back, from Gremlin Graphics.

News

6 News Desk Who launched what at the showpiece Consumer Electronics Show (CES), held in Chicago earlier this week.

40 Communications Graham Edkins returns with the latest news from Compunet.

42 Soundcheck Cheetah Marketing has converted its Spectrum Midi interface to the Amstrad CPC machines. Mark Jenkins looks at the new version.

Features

13 Philips TV tuner Turn your composite video monitor into a TV with this device.

14 1st Word Plus GST's word processing program is now running under Gem on the Amstrad PC. Roger Howorth assesses its chances.

28 Readers' Survey Help us serve your interests better by filling out the questionnaire – you could win a copy of Superior's *Success in Software* booklet.

Programming

17 First Steps in machine code Kenn Garroch begins a new series on programming, explaining the principles of machine code for beginners.

19 Listings If election-speak is beginning to pall, turn off the TV, switch on the micro and type in the first part of Duncan Evans' Popular Election game for the Spectrum. Non-Spectrum owners can content themselves with the final part of Micromon on the C64, Register Loader on the CPCs and a font designer for the QL. Plus Bytes and Pieces.

39 Peek and Poke Kenn Garroch answers your programming queries.

Special Supplement – the BBC

24 Games reviews *The Big KO* and *Phantom* from Tynesoft, *Imogen* from Micropower and *Starquake* from Bubble Bus are among the selection of games reviewed.

26 Genie Desktop accessories from PMS.

32 Music 5000 Mark Jenkins reports on the updated version.

33 Quest Mouse and special offer Watford Electronics' has produced a mouse and software for the BBCs, and we've got a special £10 off deal for *Popular* readers.

34 Spell checker and graph plotter Utilities from Computer Concepts.

Games

48 New releases Your complete guide to all the games released this week, including *Barbarian* from Palace Software, and *Thing Bounces Back* from Gremlin. Plus *Space Max*, a space station 'construction kit' for IBM PCs and compatibles from Final Frontier Software.

Editor Christina Erskine **News editor** John Brissenden **Technical editor** Duncan Evans **Production editor** Michelle Beauchamp **Supplements editor** Christopher Jenkins **Supplements designer** Barbora Hajek **Marketing and Advertisement manager** David Osen **Advertisement executives** Jon Beales, Athena Peerman **Classified executive** Susannah King **Editorial secretary** Annmarie O'Dwyer **Credit control manager** Gabriella Piscina **Managing editor** Peter Worlock **Publishing director** Jenny Ireland. **Published by** Sunshine Publications Ltd, 12–13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Fax 01-439 0681 **Typeset by** Magazine Typesetters, 6 Parnell Court, East Portway, Andover, Hampshire. **Printed by** McCorquodale Magazines, Andover, Hampshire. **Distributed by** S M Distribution, London SW9, Tel 01-274 8611, Telex 261643.
© Sunshine Publications Ltd 1987. ISSN 0265-0509

ABC

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

Popular Computing Weekly. Tel: 01-437 4343.

LETTERS

White streaks on the 64

You stated that Load-It for the Commodore C2N tape deck (Next Week, May 8 and Review, May 15) would solve alignment problems once and for all.

However, I own a 1531 tape deck, so could you tell me if Load-It is available for the 1531?

Only about seven of my 20-odd games (which loaded a couple of months ago) load now. I think it is my C64 because some white streaks about one centimetre long flash across the screen every now and again and make a crackling noise.

Although I think it's the power pack, but it could also be poor alignment of the tape heads.

It is still under guarantee, so could you advise me and tell me what's gone wrong?

Also could you tell me if Blite and Ocean are releasing *Ikari Warriors* and *Batman* respectively for the C64?

J Murphy
Tunley, near Bath

We assume that Load-It can be fitted to the 1531; contact the manufacturer on 021-745 4970 to check.

However, it sounds as though your power supply is the real problem, though, and yes, this will mean taking it back to the shop.

We believe that both *Ikari Warriors* and *Batman* are scheduled to appear on the C64, but haven't seen them yet.

Solution service for adventurers

I am trying to start a small business called Game Solutions. It is to help puzzled Spectrum adventure players.

I can help on most recent Spectrum adventure games (except Level 9). The help available comes in three forms:

1) Specific questions – people should write to me at 62 Leighwood Avenue, Leigh on Sea, Essex SS9 4LG, enclosing a 20p coin. I will then answer as many questions on games they are stuck on as they like. But they should make sure the games are fairly recent and reasonably well known.

2) Typed solutions – I have solutions to the following games. Each one costs 20p. You can order as many as you like in one go.

Games available are *Subsunk, Imagination, Seabase Delta, The Helm, Sherlock, Gremlins, Robin of Sherwood, Robin of Sherlock, The Hulk, Spiderman, Terrormolinos, Hampstead, Colour of Magic, Bored of the Rings, The Boggit* and *Project X – The Microman.*

All of these solutions are available in program form at 20p each. Please include a blank tape for recording.

3) Phone calls (0702 510136) – I will be able to take calls asking for help on Sundays between 5pm and 7pm (only these times, please).

Colin Walsham
Leigh on Sea

"It's quite a little money-spinner I believe."

Atari printing without tears

If anybody out there owns an Atari ST, a Canon PW-1080A printer and the *Signum* word processor they may have found that they couldn't get them all to work with each other properly.

They may be interested to know that the problem is easily solved, although it means opening up the printer and soldering in a resistor to the mother board which will probably void any warranty still left on the printer.

The problem seems to lie in the fact that a number of printer manufacturers, whilst adhering to the Centronics standard, have chosen to use resistors of a lower rating than others in their interfaces. With most computers this has proved to be no problem; however, the Atari ST's seem to have an output that sometimes causes synchronisation errors. For some reason, *Signum* seems to produce this error much more readily than other printing software.

The solution is to solder a 150 ohm resistor across pins 1 and 19 of the input socket of the printer. This unfortunately means that the printer must be pretty well dismantled to get at the underneath of the mother board. Luckily, due to the excellence of construction used by Canon, it's not as difficult as it sounds. The only thing to watch is that the power supply has to be loosened and slid to one side to remove some earth wires before the board can be lifted out.

Once all this is done and the printer is reassembled you should find that the ST, the Canon and *Signum* are now talking to each other properly. This will also work for the Kaga Taxan 810 (which is a Canon under a different name) and may also work on Juki, Mannesman Tally or Triumph Adler if they appear not to like *Signum* much.

As to whether or not it's worth going to all this bother just for one program I suggest you have a look at the final output to convince yourself it probably is (my thanks to Hugh Gollner for the info).

Mark Annetts
Richmond, Surrey

Too much for the C2N

A word of warning to any Commodore 64 cassette user. After twelve months of trouble free loading, saving and verifying, I had come to regard my C2N as a trustworthy hunk of hardware.

The problem started after shelling out 15 green ones on *Gunship* from Microprose.

After 20 minutes worth of loading I thought to myself, this had better be good, and it was, but that is enough of that. A marathon four hour session ended in frustration, when (after a stunningly successful mission), instead of reviewing my performance the file being searched by the program was never found. The tape ended. The program locked up.

Did I check the tape head? I dutifully cleaned and realigned and all was fine till a day later it happened again, and again, and again. In hope I tried a friend's deck and that worked . . . for two days.

As you will know, *Gunship* was originally meant as a disc program, but after years in development Microprose must have felt the need to tape it. I am sure all that time paying programmers' salaries soon mounts up but all that file accessing is just too much for the poor old C2N. So come on Microprose: if it doesn't fit, don't force it!

T A Kelly
Middlesbrough

Microprose says that if you fill in the form on your inlay card and send it to the company, you will be able to use its helpline service, which may suggest a solution to your problem.

Making Neos work with Geos

I read with interest your April 17 issue supplement with the article on *Geos*, but was very disappointed to see that *Geos* is not compatible with current mice.

This was very distressing as I had purchased a Neos mouse just the week before, and had got it principally with a view to purchasing *Geos* for my Commodore 64.

However, I have since discovered that the Neos mouse can work as a joystick if it is plugged in with the left mouse button held down. This also means that it need not be unplugged to allow typing on the keyboard as is required with it in its normal mouse mode. This means that the Neos mouse (which is the one that comes with the Commodore Connoisseur's Compendium, which you mentioned) is therefore compatible not only with *Geos*, but with all other software which is joystick controlled.

Iain Murray
Dundee

Whose copyright on my programs?

I am employed as a software engineer. I design, modify and test industrial software written in a low level type language (Siemens Step 5). This software controls machine tools and runs in an industrial control computer system (CMC machines).

I wish to write games or educational software in machine code and Basic. They would run on a Commodore 64 or BBC B computer and I would

like to offer them to commercial software houses.

The computer equipment I wish to use is my property and the development work would be carried out in my own time.

Could my employer claim copyright on such programs?.

Marion Tuck
Hove, East Sussex

The copyright would be yours unless there is a clause in your contract stating that any programs you develop must be offered to the company first.

Rainbird revisited

In *Popular*, 13–19 March, you did a review of Rainbird's *Advanced Art Studio*. To use the sprite files you have created, you needed to use the RS232. Does this mean that you need to use two ST computers?

Secondly, in the same magazine, you made a comment that you may do a comparative review of Eidersoft's *Prosprite Designer* (which they claim to be 'the slickest sprite and animation designer available.') and the Microdeal sprite designer. Have I caught you out? If so, will you be doing a review?

K Gordon
Nottingham

You only need to use RS232 to transfer files form one micro to another, not to use them simply on your ST.

The comparative review of the sprite designers appeared in *Popular*, April 3.

Monitoring the Amiga 500

I have some experience with buying computers, having purchased a BBC B and 520STM in the past.

While it was easy to get the machines, due to friendly and helpful salespeople, getting information on monitor compatibility proved a nightmare.

I currently own a Philips CM8533, but I am not sure whether it will work with the new Amiga 500. Please will you print a list of monitors which will fit on the new Amigas when they come out.

Richard Van Tienen
Bury St Edmunds

The A500 has a standard RGB monitor connection, and hi res mono video output, and a RF modulator will be made available at launch. This makes the list of potentially compatible monitors rather longer than we have room for here. Most Amiga dealers will, of course, be stocking suitable hi res colour monitors.

In defence of benchmarks

I was surprised that BmA and BmB were perceived as put-downs (Letters, May 22). They merely show the other side of a coin that will always be two-sided.

To recollect, some readers were suggesting that there was a need for more speed-related benchmarks. Official benchmarks have undergone change but are still concerned solely with speed.

It is, incidentally, the speed of the GOSUB, not Street Basic's PROCEDURE that is measured. However, I am grateful to Alan Gray and Jonathan Temple for correcting my misrepresentation of the recursion position, and their figures should, of course, be substituted.

John Coll, speaking on BBC TV, said that the original benchmarks were designed to expose a Rom author's inadequacies. I make no such claim for mine and it would have been grossly misleading had I done so.

They do demonstrate that Steven Vickers (for it is he) has forsaken speed in order to place as few restrictions as possible in the path of the 'absolute beginner' (his stated target). Apart from some quite sensible, alphabetic restrictions – you can nest 26 FOR-NEXT loops if you really want to – the only limitation is available memory and imagination.

This applies to the GOSUB stack, string length, complexity of expression, program area, number of array dimensions, UDG area, input buffer and machine stack to list but a few. The suggestion is not that you should use very long lines – but that if you exploit the system's flexibility, you will only ever encounter that single limitation.

The MSX standard is designed "in the American tradition of solving one's problems by means of much equipment rather than by thought". Using extra hardware for sprites and collision detection merely deludes and cocoons the beginner. In contrast, the Spectrum programmer achieves results using pure Basic or pure machine-code and has an immediate, genuine sense of achievement.

As to the computed GOTO – life begins at 40. This was instruction 0 on the world's first computer – built at Manchester in 1948 and subsequently licensed to IBM. Much of the pioneering work was done by a young, Cambridge mathematician who, some years earlier had begun designing instruction sets and writing programs first for a 'Turing Machine' and then for the 'Automatic Computing Engine'.

He found that it was possible to achieve very fast, conditional branching not by testing conditions, but by forming the next instruction from those conditions.

Forming, instead, the next address is just a variation of this theme and the essence of the computed GOTO.

It is present in all instruction sets. Motorola recommends using JMP (An) for speed on the M68000. You can use it on the Spectrum in Basic and machine-code JP(HL). If a high-level language doesn't have the computed GOTO, it can't claim to be Symbolic Instruction Code.

Similarly, you won't find the ELSE construct in a Vickers Basic (he wrote ZX 81 Basic as well) since there is no instruction code equivalent.

You will find ELSE in his Forth-based Ace because this structured language makes no claim to be symbolic.

By constructing an ELSE or unbounded loop in Basic, you automatically learn how to do it in machine code.

If benchmarks are to shape the evolution of Basic, then let's ensure we safeguard the interests of the true owners of Basic. Most of these people do not own a computer. Most of them have yet to start buying this magazine. It is solely for their benefit that any "improvements" should be made.

G Wearmouth
London N17

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

Knight moves

The latest round of readers' votes in Game Two of the *Colossus* chess tournament did not surprise the computer opponent. As expected, the readers moved their knight back to c3. *Colossus* continues to build its attack on the queen's side with the bishop. (See diagram for details.)

The next move

So, how would you contain this attack?

Send your suggested readers' move to *either* Inter-Mediates (*Popular* Chess), Freepost, Sawbridgeworth, Herts CM21 9YA (no stamp needed), *or Popular* Chess, Unit 2, The Maltings, Sawbridgeworth, Herts CM21 0PG (with a stamp). Please note that Freepost is slower than the normal service, so if you want to save stamp money, get your entry off promptly.

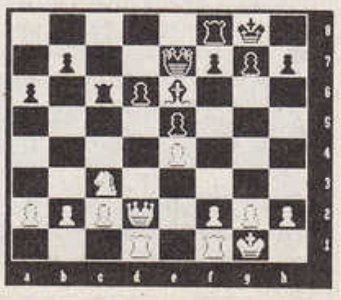
Only one vote per person please, and all entries must reach either address by Wednesday, June 10.

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

Next week, we return to Game One, where the Readers are playing black.

Game Two

1	Pe2-e4	Pc7-c5
2	Ng1-f3	Nb8-c6
3	Pd2-d4	Pc5xd4
4	Nf3xd4	Pe7-e5
5	Nd4-b5	Pa7-a6
6	Nb5-d6+	Bf8xd6
7	Qd1xd6	Qd8-f6
8	Qd6-d1	Ng8-e7
9	Nb1-c3	Pd7-d6
10	Bc1-e3	Ke8-g8 o-o
11	Bf1-e2	Bc8-d7
12	Ke1-g1 o-o	Re8-c8
13	Qd1-d2	Nc6-d4
14	Ra1-d1	Nd4xe2+
15	Nc3-e2	Rc8-c6
16	Be3-g5	Qf6-e6
17	Bg5xe7	Qe6xe7
18	Ne2-c3	Bd7-e6
19	?	



Amstrad to launch PC1640 in US

AMSTRAD was expected to launch its new PC range at Comdex in Atlanta, US, this week.

The new PCs are enhanced versions of the PC1512 range. They have 640K Ram, and built-in MGA, CGA and EGA adaptors – mono Hercules, colour graphic adaptor and enhanced graphic adaptors. The new machines are believed to use the Intel 80286 processor.

As with the PC1512s, a choice between mono or colour monitors and floppy or hard drives is being offered by Amstrad.

The new models are to be called the PC1640 series, and while not replacing the PC1512s, for the time being at least, they will be sold in more specialist outlets, leaving the PC1512s to mass market and consumer electronics outlets.

Amstrad has scheduled the PC1640 for delivery in the US on September 1, although it is not yet clear when they will appear in the UK. US prices range from $899 (about £599) to $1,999 (about £1,335), which means that the PC1640s will sell for $100 more than their direct PC1512 equivalents. Again, price details for the UK are not yet known.

An announcement from Amstrad is expected shortly.

BT Bielby deal

FIREBIRD Silver has signed an exclusive deal with budget distributor Richard Bielby.

Bielby previously sold Silver product into the shops in tandem with Codemasters', on a UK basis.

This latest move means that Bielby will no longer be dealing with Codemasters' product.

Codemasters' David Darling explained the implications for the company.

"It won't be making any difference. Codemasters already handles all its European and worldwide distribution itself – in future, we'll handle the UK side as well," he said.

"It should be a smooth changeover."

Darling added that he and his family colleagues at Codemasters, father Jim and brother Richard, are on good terms with Bielby. He is assisting them with their changeover plans.

Bielby made a name for himself in the early days of Mastertronic – now the UK's leading budget software house.

It was Bielby who helped get Mastertronic product sold through CTNs – confectioners, tobacconists and newsagents.

This has been an important factor in the success of Mastertronic and of budget software generally.

Commenting on the Firebird deal, Bielby described the move last week as inevitable, and said:

"The decision to go with Firebird was based on our experience of working with them over the last twelve months in the independent market: our knowledge of their future products already in the pipeline; and the fact that we have been given the opportunity to expand our area of operation into the multiple market."

Firebird Silver boss Chris Smith commented: "We are over the moon."

Furry tales in carroty game

CRL is launching a karate game with a difference this month. *Ninja Hamster* features the eponymous hero, who's up against a rat, a lizard, a bee and other creatures.

But why a hamster? "We don't really know," explained a CRL spokesperson.

"It's a karate fighting game, following on from all these Karate and Ninja things. Someone had the idea to do one with a lot of humour, so it's got all these large cartoon animal characters."

Ninja Hamster will be released shortly for the Spectrum, with Commodore and Amstrad versions due in July. It costs £7.95 on cassette and £14.95 on disc.

Further information from CRL, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD, telephone 01-533 2918.

VDU dangers: new book

A NEW book detailing the disturbing side-effects of VDUs has been published by the London Hazards Centre.

The VDU Hazards Handbook is based on over 10 years' research, and has come up with some worrying claims.

- VDU operators are twice as likely as other clerical workers to suffer from angina.
- A VDU operator sitting 18 inches from the screen experiences a positive electrical charge of 150 volts per square inch (compared with three volts per square inch under normal conditions).
- Low frequency radiation like that emitted from VDUs has been shown to cause deformities in the foetuses of rabbits, rats and chickens.

The book comes only weeks after a report exposed similar dangers for workers at the London Borough of Newham (see *Popular Computing Weekly*, May 8).

The VDU Hazards Handbook, by Ursula Huws, costs £4.95 plus 50p postage and packing from London Hazards Centre, 3rd Floor, Headland House, 308 Gray's Inn Road, London WC1X 8DS, telephone 01-837 5605.

Page 3 touch works for Barbarian: Amiga version soon

PALACE Software is working on an Amiga version of its new hit game *Barbarian*.

Palace managing director Pete Stone confirmed the move last week, but was unwilling to give a firm commitment on release dates.

"We wouldn't like to predict anything yet. It's a little bit too early to say, because the Amiga is a much bigger and more complex machine," he said.

"It's not just a conversion the graphics, sound and so on have all yet to be redone."

Meanwhile Palace's use of Page Three model Maria Whittaker in the artwork for its new hit game appears to be getting the publicity the company hoped for.

Boots recently gave Palace an ultimatum – remove the picture of a scantily-clad Ms Whittaker from the packaging, or it wouldn't stock the game.

Palace agreed to the demand, and produced new artwork especially for Boots, with Whittaker removed from the cover and no poster included.

Stone denied that the move was a climbdown. He claimed that *Barbarian* is currently the UK's fastest selling title.

He added that no other retailers had complained about the pictures – which show Ms Whittaker draped around an equally scantily-clad strong silent type.

So why did Boots? "They felt – for whatever reason – that they didn't want to stock the game with Maria Whittaker on the cover, and on the poster inside.

"It's one of those covers that produces a lot of feeling, for and against."

A Boots spokeswoman confirmed that the company "didn't want that sort of packaging in its stores". But it appears that Boots didn't object to the semi-naked man. He still appears on the cover.

Questions for Amstrad as Futura appears

TONY Tebby is a man best known for writing the operating system for the QL. At last weekend's ZX Microfair the Futura, purported to be the machine that the QL was supposed to be, was displayed on the Sandy stand.

On paper, the system features a full 68000 processor, a 3½ inch disc drive, S12k memory and a proper keyboard.

When all the bugs have been pulled out the operating system will be, "compatible but not the same as ODos," said Mr Gardner, one of the directors of Sandy.

However, the basic Futura model has exactly the same screen resolution as the QL and claims to be able to load all QL software. Amstrad, which owns the rights to the QL technology was not available to comment as we went to press.

As yet there is no release date for the Futura, although a price tag of £575 for the basic model has been mooted.

SOFTWARE HOTLINES

Everybody in the world wants to talk to **Douglas Adams** at the moment. The man is in the middle of 'meet the press' sessions not only in the UK, but also the US, Canada and other places too distant to mention.

Such is the price one must pay for not only having just completed a book – *Dirk Gently's Holistic Detective Agency* – but also an adventure game – *Bureaucracy*, published by Infocom.

However, since *Popular* is the sort of mag that prefers to work on forward rather than reverse thrust, here's what the prolific Adams plans to do next.

Despite feeling that the *Hitchhikers' Guide to the Galazy* theme is probably played out, Adams hopes to produce a follow-up *Hitchhikers'* micro adventure, although there will probably be less direct Adams involvement in the sequel than than the original.

He also has plans to write an adventure concerning the difficulties of getting one's movie made in Hollywood (a pressing problem for many, I'm sure). Says Adams, "The situations in *Hitchhikers* seem mundane compared to the difficulties I had with the movie when I was out there."

He's also been getting into computer music, having amassed a fair collection of synthesiser and Midi equipment, and would like to release an album. Track details are necessarily sketchy – most of it at the moment is in the form of Macintosh sequence files, but according to the composer, "it'll be somewhere in the nebulous area between rock and jazz".

On to more immediate matters, and **Ultimate,** having been on a year long sabbatical between the US Gold deal and the release of *Martianoids,* is fairly racing now with the launch of *Bubbler* (pictured below).

The story behind the game involves the ancient city of Irkon, the evil wizard Vadra, your imprisonment by Vadra, and your malicious transformation into an amorphous blob.

Citizens of Irkon are kept as an Irkonoid version of the Stepford Wives thanks to spell-bound bubbles oozing out of bottles. Yup, it's up to you, the amorphous blob, to break free and destroy Vadra's power.

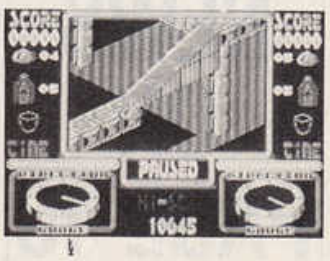
This translates as an arcade adventure in true collect, dodge, explore tradition in two colour 3D block style dimensions. However familiar this type of screen display now is, let us not forget that it was Ultimate, after all, which pioneered it.

US Gold has an intriguing game out soon called *Where in the World is Carmen Sandiego?*

The game itself involves you exploring around the world in search of Carmen (leader of an international gang). What makes it intriguing is the inclusion in the packaging of the *1987 World Almanac and Book of Facts* (all 928 pages of it), which apart from containing information on almost any aspect of the US economy, demography or sociology you care to think of, is essential to solving the game.

Even if you don't get round to playing the game, think how much ice you can break at parties by casually slipping in a few crop export statistics, or what percentage of households own TVs, broken down state by state.

Christina Erskine



NEXT WEEK

First steps in machine code

Kenn Garroch continues his series on making a start in learning machine code, with explanations of common machine code instructions.

Devpac 2

Tony Kendle tries out Hi-Soft's *Devpac 2*, the brand new assembly language development system for any CP/M machine, and upgrade to the evergreen *Devpac*.

Popular election

Take a break from all those politicians on TV, and get down to some real political nitty-gritty with part two of Duncan Evans' election game for the Spectrum.

Stifflip and Co

In all the hullabaloo surrounding Palace Software's *Barbarian* combat game, its other release, *Stifflip and Co*, has got a bit overlooked. This is a travesty of justice . . . find out why in next week's issue.

Locoscript 2

Is this what *Locoscript* users have been waiting for? Faster operations, easier menus? We put the new version through its paces.

MORE NEWS ON PAGE 10

Starglider in TV and arcades deals

COIN OP giant Bally/Sente has bought the licence to convert Rainbird's *Starglider* for arcade use.

Rainbird claims that this is the first UK-originated title to be converted into an arcade game.

The conversion uses the Amiga technology recently bought by Bally for use in its new arcade machines (see *Popular Computing Weekly*, March 27).

It is understood that other Rainbird titles will be bought up for conversion in the near future.

In a separate development last week, Rainbird was officially "chuffed" at the news that ITV children's programme *Get Fresh* is to feature *Starglider* in a weekly competition during its Saturday morning slot.

Starglider* on TV's *Get Fresh

The competition is called Get Mucky. Two teams compete for the highest score within 50 seconds on two specially adapted Amiga versions of the game.

Get Mucky will run three times on every show from May 9th to August 30th – and the winning team will win an A1000 Amiga system for its school.

TV adventure game first due in September

ANGLIA TV's *Knightmare* is an eight-part series, set in a dungeon, which will be on children's ITV from September 7 (see *Popular Computing Weekly*, March 20).

Devised by Tim Child, it makes great use of sophisticated special effects created by a 24 bit 'Spaceward Supernova'.

The game involves contestants in teams of four, in "a quest with a set of perils and puzzles backed by a professional cast of monsters, wizards, warriors and other 'supernatural' apparitions."

It is not clear which professional monsters are scheduled to appear. But deviser Tim Child did explain why he chose the form of the show.

"A true role-playing game should never play the same twice. A lot of adventure games are based on mapping and solving a maze. This just wasn't good enough for a TV series."

Knightmare

"Competitors won't escape from the *Knightmare* dungeon that easily. For a start it's irrational – it keeps shifting and changing. And the perils and puzzles change with it," he added.

ELECTION

ARE YOU HONEST, CARING AND CHARMING?
THEN ELECTION IS NOT THE GAME FOR YOU.

RE-DISCOVER THE DARKER SIDE OF YOUR PERSONALITY AS YOU FIGHT OFF THE DETERMINED (AND DIRTY) OPPOSITION TO BECOME PRIME MINISTER AND WIN THE ELECTION!

THIS EXCELLENT ARCADE GAME ALLOWS YOU TO ADOPT THE LEADERSHIP OF ANY OF THE GAME'S FOUR POLITICAL PARTIES. YOU COULD BE MATCHER, NINNOCK, OWING OR PIG-IRON OR EVEN DANIEL PAUL — SELF STYLED CELEBRITY LEADER OF THE 'IDEALIST PARTY'.

CANVASS VOTES, PLACE MANIFESTOS AND SLUR FELLOW POLITICIANS ON THE ROCKY ROAD TO 10 DOWNING STREET.

AVAILABLE FOR COMMODORE 64/128, SPECTRUM 48/128 AMSTRAD CPC ON CASSETTE AT £9.95

£9.95

PLEASE SEND ME *ELECTION*

☐ COMMODORE 64/128 ☐ SPECTRUM 48/128 ☐ AMSTRAD CPC

NAME .....

ADDRESS .....

.....

PLEASE MAKE CHEQUES AND POSTAL ORDERS PAYABLE TO VIRGIN GAMES LTD.
DO NOT POST COINS OR NOTES.

VIRGIN GAMES, 2/4 VERNON YARD, PORTOBELLO ROAD, LONDON W11 2DX.

DIARY DATES

JUNE

12–14 June
Commodore Show
Novotel, Hammersmith
Details: First public showing of A500 and A2000 Amigas
Price: £3 adult, £2 children
Organiser: Database Exhibitions, 061-456 2991

30 June–2 July
PC User Show
Olympia, London
Details: Hardware and software for all users of IBM PCs and compatibles
Price: £5
Organiser: EMAP International Exhibitions
01-608 1161

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.

MASTERTRONIC ENDS SEGA SAGA

GAMES consoles were much in evidence at this summer's Consumer Electronics Show held in Chicago last weekend.

Mastertronic's strong presence (it was one of the very few British companies there) was reinforced by its announcement that it has taken on the distribution of the Sega games console in a deal signed last Saturday.

Mastertronic says it plans to launch the Sega machine in September in the UK, at a price of £99.

The company also has access to all 30 Sega cartridge software titles, and will initially release 12 of them this autumn. The plan is apparently to get the machine itself safely into the shops this year with some software, and concentrating on building up the software base in 1988.

No prices have yet been fixed for the software, but Mastertronic also hopes that third party companies will begin publishing software for the Sega on cartridge.

The company hopes to sell the machine through computer and consumer electronics outlets, toy stores, "whoever will take it", as one Mastertronic executive is reported to have said.

This news finally settles the long running Sega saga – the machine was originally to have been distributed by Ariolasoft, but the two companies apparently could not agree on a pricing policy.

Mastertronic also expressed interest in one of the show's main talking points – CDV, combined music and video compact disc players. Arch budgeteer that Mastertronic is, it's waiting for the price to fall a bit before getting involved.

Also on the games console front, Nintendo, which currently dominates the market, exhibited with a number of new software packages using 3D glasses for added effect. Sega also took advantage of this particular add-on, with a 3D missile defence game (glasses required).

Atari also took a large stand at the show, where it showed its two PC models in the same configuration as the UK version for the first time – a basic 'consumer priced' PC clone, and an enhanced version with graphic adaptors.

Atari also showed a new disc drive for its 8-bit range; it has three times the capacity of the current model, but will, according to Atari, sell for the same price. Details of availability in the UK are as yet unclear.

The company also launched its 65XE games console to the US consumer, a product previously understood to be exclusively for the European market. In the States, the machine will be bundled with *Flight Simulator* and *Missile Command*, a deal that could yet find its way over here.

On the subject of flight simulators, Microprose US had a real one running on its stand and has promised to being it to the UK for the *PCW* show at Olympia, London, in late September.

The show was probably more software than hardware orientated this year – apart from the games consoles and Atari. Commodore did not take a stand for the second year running, and would appear to have written CES out of its show plans.

PLUS 3 PROSPECTS

Christina Erskine assesses future possibilities for Amstrad's disc-driven Spectrum

Most of the improvements made to the Spectrum over its five year life have been largely cosmetic: upgrading of memory from 16K to 48K, replacement of the rubber keyboard by its clackety clack counterpart; further memory upgrade to 128K (plus improvements to its sound) and the Plus 2, with its proper keyboard and built-in tape drive.

On to the latest, the Plus 3. The addition of the disc drive has been augmented by the installation of the CP/M operating system, the 10 year old standard which has enjoyed a recent renaissance largely thanks to Amstrad. It makes the Spectrum Plus 3 look much more like an Amstrad machine than the Plus 2 did.

The Spectrum computers have now effectively replaced the Amstrad CPCs – the Plus 2 is £150 cheaper than the colour 464, although of course, while the Plus 2 has the tape deck it doesn't have a monitor. The Plus 3 will be £150 cheaper than the colour 6128.

Software houses have been saying for some time, that the games market for the Amstrad CPCs is more or less dormant, at least in the UK. Many claim that the only thing that makes a conversion of a title to the CPCs worth doing is the size of the market on the continent.

Retailers, too, are less enamoured of the CPCs; WH Smith, for example look set to drop the 464 and 6128 to make room for its Atari STs this month.

Amstrad's 'leisure' computers are now the Spectrum Plus 2 and Plus 3. And looking at the price differential (£100), probably both of them, for a while at any rate will continue to be sold.

The test for the Plus 3's success is, as ever, software availability.

While the full range of Spectrum titles was available for the Plus 2, it is rather more chancy on the Plus 3. There is no software on disc for the Spectrum – because the Spectrum has never had an accepted standard disc drive. So while there is software to run on your machine, getting it on the right format leaves you at the mercy of the software companies.

They are being understandably cautious.

Further software is likely to be in the form of back-catalogue compilations, at least at first. If firms do start bringing out their Spectrum games on disc as well as tape as a matter of course, as many now do with Amstrad CPC and Commodore releases, the price differential may well startle Spectrum owners.

They are used to having a pound or two knocked off their version compared to prices for Commodore and Amstrad versions. At the current price of blank 3 inch discs, £14.99 will be the norm.

Compilations will therefore be safer, from the perception of value for money, and lack of risk to software houses.

Then there is the possibility that it will enable companies to produce much bigger, better games, because disc access during a game will become feasible and you can use the whole 350K of the disc for the game.

It's an attractive idea, especially since 'bigger' is unfortunately about the only sort of 'better' Spectrum games players look like getting at the moment. The software companies have been woefully short of innovative ideas recently.

Disc access during games has caught on to a certain extent on the Commodore 64, but less so on the Amstrad – curious, seeing that one of the Commodore's major drawbacks is the appalling slowness of its disc drive.

However, it is an attractive idea, although it must be said that the bigger games promised for the 128K versions of the Spectrum, which have now been around for 18 months or so have never really materialised in any number.

It is more likely that programs will gradually be issued on disc as well as cassette rather than separate versions being developed – perhaps eventually leaving the tape only area to the budget companies.

However, it is the combination of proper keyboard and fast storage that at long last makes the Spectrum suitable for use other than as a games machine. Interestingly, when Alan Sugar bought the rights to the Spectrum in April 1986, it was as a games machine that he saw his purchase.

That there is an interest in small business type use, or for utilities, is evidenced by the software that has been produced. Look at *Tasword*, for example. But since Microdrives never took off (even though there were, and possibly still are, those who swore by them, no-one seemed to believe them) any program which requires to to store bits of data, say, files, graphics, records, whatever, has been a no-no, thanks to a lack of an alternative to tape.

Only the very dedicated user splashed out on a third party disc drive.

The Plus 3 opens up this whole area to Spectrum owners and potential owners who suspect they won't want to spend 100% of their time playing games.

The question of CP/M on the Plus 3 is interesting. The new DOS has file compatibility built-in, Digital Research has agreed that CP/M can be implemented. However, this may not mean instant access to all those cheap CP/M programs which have become available thanks largely to the success of the PCW8256.

CP/M expects either a 40 or 80 column screen. The Spectrum has a 32 column screen. CP/M programs will load and run, but you wouldn't be able to use, say, *Wordstar*, with all its menus.

Advert prepared on an Atari 520STFM using "Publishing Partner" and printed in one pass on a QMS PS800 Laser Printer

Evesham Micros

Don't forget all prices *include* VAT and delivery

PRINTERS

Select a printer bargain from Evesham Micros' carefully selected range; chosen for quality, reliability and value. We believe our offers are the best in the country, when comparing prices remember that ours *include* VAT, printer cable to suit your micro and insured/receipted delivery. The price you see is the price you pay.

"WHICH" magazine BEST BUY

Star NL-10

Our most popular printer. Our sales now exceed 1,500 units and still only three faulty! Need we say more. Many interesting features make this the class printer buy in it's class.

- **Automatic single sheet feed**
- **Tractor and friction feed built in**
- **"Front panel" selection of many modes**
- **Double and quad height characters**
- **Interchangeable interface cartridges**
- **Low cost cut sheet feed option**

Ideal for Commodore owners, buy with the 64/128 cartridge and use as a CBM ready printer. If you change your micro just buy a new cartridge.
In a group test with other popular printers in the price range such as Epson, Citizen and OKI *What Micro* described the NL-10 as **"the Rolls Royce of this group".**

Only £249.00

Cut sheet feeder available as an option at £63.25

15" carriage

Star NX-15

Wide carriage vesion of the NL-10. Most features are the same in particular the quality and reliability offered by Star printers. An exceptionally keen price for such a good printer.

Only £349.00

Cut sheet feeder available as an option at £159.00

24 PIN TECHNOLOGY

Star NB24-10 NB24-15

Part of the new breed of printers. Using 24 pins instead of the conventional 9 a whole new standard of dot matrix printers is appearing. These Star models offer this technology, and at our prices are very affordable.

- **216cps draft mode, 72cps in NLQ!**
- **Optional font cartridges available**
- **Auto single sheet feed with tractor built in**
- **Sensibly priced cut sheet feeders**
- **Dozens of other high tech. features**

If you want one of the new class of printers then you won't find better quality and value than these.

NB24-10 (80 column) Only **£499.00**

NB24-15 (132 column) Only **£699.00**

Cut sheet feeders £63.25 & £159.00 respectively

Panasonic KXP-1081

A superb printer for the money. This must be the best sub £200.00 printer on the market. We don't know of any other similarly priced printer that can match it for print quality, reliability and ease of use.

- **Friction and tractor feed**
- **120cps draft and 25cps NLQ**
- **Epson/IBM compatible**
- **Wide range of print styles**

Only **£189.00**

A lot of printer at a very tempting price, you could pay much more than this for much less!

Micro P. MP165

A very popular printer that must offer the best speed per pound. Epson compatible to the extent that it even uses an Epson ribbon. Very well defined NLQ mode that many feel is the best on any 9 pin matrix printer.

- **165cps draft mode, 35cps in NLQ**
- **Friction and tractor feed built in**
- **2K buffer**
- **2 year guarantee**

Only **£219.00**

A high specification printer for a very modest price.

OTHER MODELS

Amstrad DMP 2000	£159.00
Amstrad DMP 3000	£179.00
Amstrad DMP 4000	£369.00
Micro P. MP200	£299.00
Micro P. MP201	£375.00
Star ND15	£439.00
Star NR15	£499.00
Micro P. MP26 (new 26cps d/wheel)	£249.00
Micro P. MP40 (new 40cps d/wheel)	£349.00

Don't forget all prices include VAT delivery & cable

If you would like further details/print sample of any model please send S.A.E.

AMSTRAD 1512

All prices include VAT & delivery

Single drive Mono.....£499.00
Double drive Mono....£615.00
Single drive Colour...£665.00
Double drive Colour..£789.00
20MB hard Mono.....£979.00
20MB hard Colour...£1169.00

EVESHAM 32 MEG 1512

We can offer amazing value by upgrading single and double drive models. We use top quality fully guaranteed Miniscribe mechanisms. Formatted capacity 32.5 MB. Upgrade to 640K is also included.

Single drive mono 32MEG/640K..... £889.00
Double drive mono 32MEG/640K..... £999.00
Single drive colour 32MEG/640K..... £1049.00
Double drive colour 32MEG/640K..... £1179.00

THE AMSTRAD OFFICE

New promotion from Amstrad, includes 1512 DD/MM, DMP3000 printer plus Wordstar and Supercalc. Great value...

OUR PRICE.....ONLY.....£789.00 inc.

THE EVESHAM OFFICE

Enhanced version of the Amstrad Office, as above plus a 32MEG hardcard and 640K memory upgrade, fantastic value.

OUR PRICE.....ONLY.....£1149.00 inc.

32 MB HARDCARD

Miniscribe hardcard, ideal for 1512, simple fitting, very low power consumption and a huge 32.5 MB formatted capacity. Supplied fully tested and configured to suit 1512.

OUR PRICE.....ONLY.....£389.00 inc.

UPGRADE YOUR 1512

Memory upgrade to 640K, full instr..... £ 19.95
Cipher 20MB external tape streamer..... £469.00
NEC V30 processor, improves speed..... £ 24.95
8087-2 maths co-processor..... £159.00

COPY II PC

Central Point Software's top rated copy program for the 1512 and other compatibles. Runs many popular business programs from hard disk without reference to floppy eg. DBASE, SYMPHONY, LOTUS 123 etc. Latest version..... £ 34.95
Also available from **Central Point is PC TOOLS**, the best features of Norton Utilities + p'ful DOS interface etc £ 34.95

ATARI ST

520 STFM..... £369.00
520 STM + mouse, d. drive & 1st word..... £339.00
1040 STF..... £559.00
SM125 Hi-res mono when purchased with ST. £ 89.00
SM125 purchased seperately..... £119.95
Philips CM8833 Hi-res colour c/w cable..... £289.00
(extra £10.00 discount on above if purchased with ST)
Cumana 1meg drive..... £149.00
Cumana 2meg (twin) drive..... £249.00

All ST computer sales include 5 disks full of software, including word pro, graphics, games, utility and demo programs.

AMIGA

AMIGA A500..... £539.00
PHILIPS CM8833 Hi-res colour c/w cable.. £289.00
(extra £10.00 discount on above if purchased with A500)

All A500 computer sales include 5 disks full of software, including utility, game and demo programs.

DISKS & BOXES

5.25 inch

Pack of 25 DS/DD disks c/w sleeves, tabs and labels. Good quality, fully guaranteed.... £ 13.95
25 disks + box Pack of disks as above plus 50 capacity locking storage box..... £22.95
25 disks + box As previous offer but with 100 capacity locking storage box..... £24.95
50 Capacity Box High quality lockable storage box. Smoked perspex top..... £ 10.95
100 capacity box As above but more capacity..... £ 13.95

3.5 inch

Pack of 10 DS/DD disks c/w sleeves and labels. Top quality, fully guaranteed..... £ 13.95
10 disks + box As above but in 10 capacity plastic library case..... £15.95
Pack of 25 DS/DD disks c/w sleeves and labels. Top quality fully guaranteed..... £33.95
25 disks + box Pack of disks as above plus 40 capacity locking storage box..... £39.95
40 capacity box High quality lockable storage box. Smoked perspex top..... £ 9.95

COMMODORE EQUIPMENT

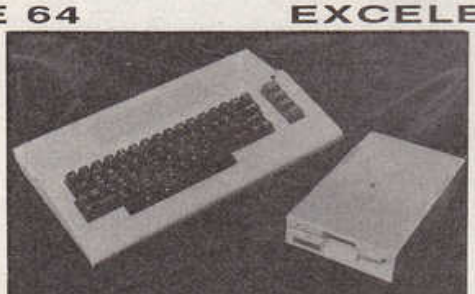
THE SLIMLINE 64

NEW LOOK '64

An easy to fit new case for your trusty '64. It feels like a new computer for just a few pounds.

- **Simple to fit**
- **Low key height**
- **New ivory colour**
- **Injection moulded**
- **Modern style**

ONLY £19.95



THE EXCELERATOR+

COMPATIBLE DRIVE

At last a truly compatible option to the 1541C. Many advantages over that model not least of which is the price saving.

- **Handles disk turbos**
- **Direct drive motor**
- **1 year guarantee**
- **External 8/9 switch**
- **Very reialble**
- **Compact size**
- **Very quiet**
- **Doesn't overheat**

Replacement power supply for CBM64..... £ 24.95
Disk Notcher... Use both sides of disks..... £ 5.95
1541C Disk drive..... £189.95
Freeze Frame MkIV...Backup/utility cart..... £ 28.95
Dolphin Dos...Parallel disk system 1541..... £ 69.95
Quickdisc+...Fastload/utility cartridge..... £ 19.95

We have most Commodore equipment in stock If you don't see what you want give us a call

Several reviews have appeared on the Excelerator+ and all have been very flattering, indeed one reviewer was drawn to comment, *"the only thing I could find wrong with it was that the sticker was put on crooked"*. Praise indeed.

Don't saddle yourself with a lumbering hippo
The Excelerator offers more for less money

ONLY £159.95

COMBINATION OFFER
Excelerator+ & Freeze Frame MkIV tape to disk backup cartridge **£179.95**

SINCLAIR

Spectrum 128K +2 pack with joystick and 6 games..... £119.00

NEXT DAY DELIVERY ON ANY ITEM £5.00 EXTRA

How to order

Send cheque/P.O. or Access/Visa details
By phone with Access/Visa no.
Government, educational & PLC orders welcome
Same day despatch whenever possible
All offers subject to availability E.&O.E.
Callers welcome, open 6 days 9.30-5.30

Evesham Micros
63 Bridge Street
Evesham
Worcs. WR11 4SF
Tel: (0386) 41989

Also at; 1756 Pershore Rd., Cotteridge, Birmingham B30 3BH Tel; 021 458 4564

VISA

EASTENDERS ON YOUR MONITOR?

Using your TV as a computer monitor is commonplace. Getting TV pictures from a dedicated monitor is rarer. Chris Jenkins tries out Philips' AV7300, for monitors with composite video input.

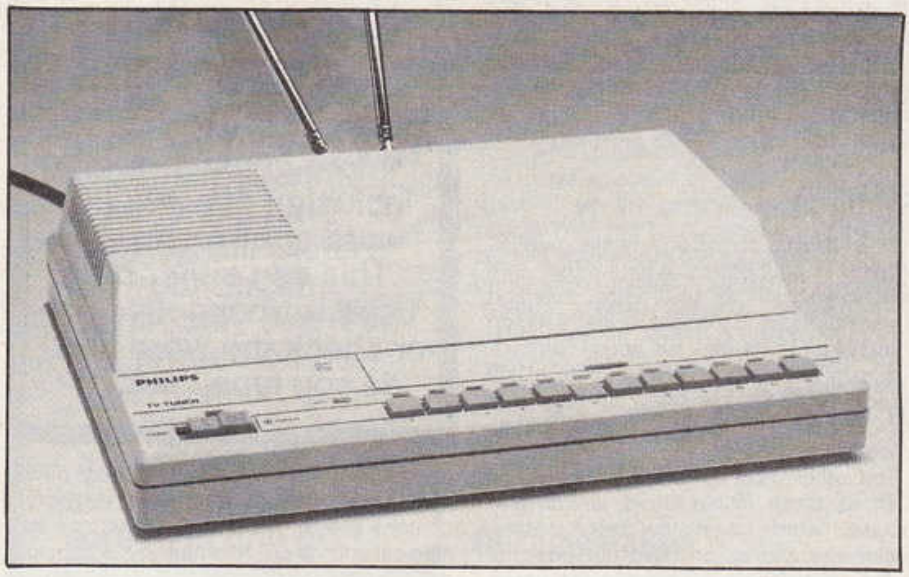
Eternal arguments over who is going to use the television – either for watching it or playing computer games – have become less common as dedicated computer monitors have become cheaper and more easily available. It still seems a pity, though, that monitors don't have the option to pick up TV signals.

Both DK'Tronics and Screen Electronics have produced TV tuners which allow you to use Amstrad CPC and other monitors as TV sets; but their design and performance left something to be desired. It's been left to multinational giant Philips to do a really good job of it.

The AV7300 is a very smart, reasonably priced and well-specified TV tuner designed to work with any monitor with a composite video and separate audio input. We tested it with a colour Commodore 1701, and a green screen mono monitor, and obtained excellent results with both. Obviously, the AV7300 is designed primarily to work with the wide range of Philips colour and mono monitors.

The AV7300 is a low, slim unit of 250 × 190 × 55mm, small enough to sit on the most cluttered computer desk, unlike the Screen's and DK'Tronics' units. It's finished in a computer beige which matches remarkably well with Commodore equipment. The mains-powered unit has a two-arm telescopic antenna. This gave good reception considering the poor position of the *Popular* offices, but a larger indoor or external aerial can be connected to the tuner if you prefer.

"It may also be a valuable tool for users of . . . the Amiga, which can be used with Genlock equipment to combine video and computer images."



The AV7300 is connected to the monitor by its composite video and audio output leads; there are also video and audio inputs, into which you plug the output from your computer.

The switch on the front of the unit, then, serves the dual purpose of switching on the tuner and routing its TV signal direct to the monitor; switch off, and the computer signal is routed through automatically. This makes it unlikely that you will forget to switch the tuner off after use. Clever stuff.

There are 12 channel preset buttons, each with a selector LED. Each channel can be tuned individually, using small thumbwheels located under a hinged flap. A pointer gives a rough visual indication of the tuning, while each channel also has an automatic frequency control LED which lights up when the signal is at its maximum strength, so it's very easy to tune in for the best local reception conditions.

At the price, the AV7300 is a sensible alternative to a colour portable TV, which would probably cost you around £149 new and would certainly take up valuable desk space. It may also be a valuable tool for users of more sophisticated computers such as the Atari ST and Amiga, both of which can be used with Genlock equipment to combine video and computer images.

Possibly the only criticism is that the AV7300 has no built-in speaker; there are still many monitors which don't have speakers either, so you would have to take the sound output to an additional amp and speaker set-up.

Other than that the Philips tuner is a highly desirable piece of kit, which should end up gracing the desks of many monitor owners who fancy a break from the spreadsheets or shoot-'em-ups.

Product *Philips AV7300 TV Tuner* **Micro** Any monitor with composite video and audio inputs **Price** £69.95 **Supplier** Philips Consumer Electronics, PO Box 298, City House, 420–430 London Road, Croydon CR9 3QR, 01-689 2166.

A REAL GEM OF A WORD PROCESSOR

GST has now introduced the PC-Gem version of *First Word Plus* word processing system originally out on the Atari ST. Roger Howorth tries it out.

First Word Plus started life as an update to GST's highly successful *First Word* written for the Atari ST. Like its predecessor, *First Word Plus* owes much of its attraction to the choice of Gem as the host operating system, providing a user interface via mouse and menus.

With the introduction of the PC-Gem version, the Amstrad 1512 or indeed any compatible running Gem can now enjoy this friendly and powerful word processor.

Features

First Word Plus sports a fairly standard list of features but because it runs within Gem text styles such as bold, italic, sub and super scripts and so on are all displayed on screen exactly as they will appear on your final print-out. This makes for quite a tidy screen as there are none of the more conventional control codes such as G embedded in your text.

The other more fundamental functions such as block manipulation, search and replace, word count, headers, footers, bookmarks and so on have not been ignored. Indeed these too are all much easier to use because of the Gem Front end: throughout the program the only things you need to type are the actual words in your document.

Spell checker

More unusual is the inclusion of a 40,000 word spell checker. This can either be used retrospectively, to check a finished document, or in real time, to check the words as you type them. This is quite a step forward because in either mode it is still working from within the main program, which makes the correction, reformat and print process a lot quicker and less painful.

Once the spell checker has spotted a word that isn't in its dictionary the user may then decide to correct the word independantly or get some help form the program. This help is provided by the 'dictionary browser', which when called up initially displays the ten words that are closest alphabetically to the offending word. However as the correct spelling of the word is rarely found in this list the program can then be asked to make an educated guess at what it thinks the correct word is, but this process can take some time. The results, however, are often good with the program presenting up to a further 10 words for you to pick from.

In addition to the main dictionary, new words can be added to your own supplementary ones which can then be used alongside it. In this way, you may have special dictionaries for various subjects, perhaps one for computing terms, one for medical and so on. Alternatively, a supplementary dictionary can be permanently merged with the main one thus saving a bit of effort and disc space.

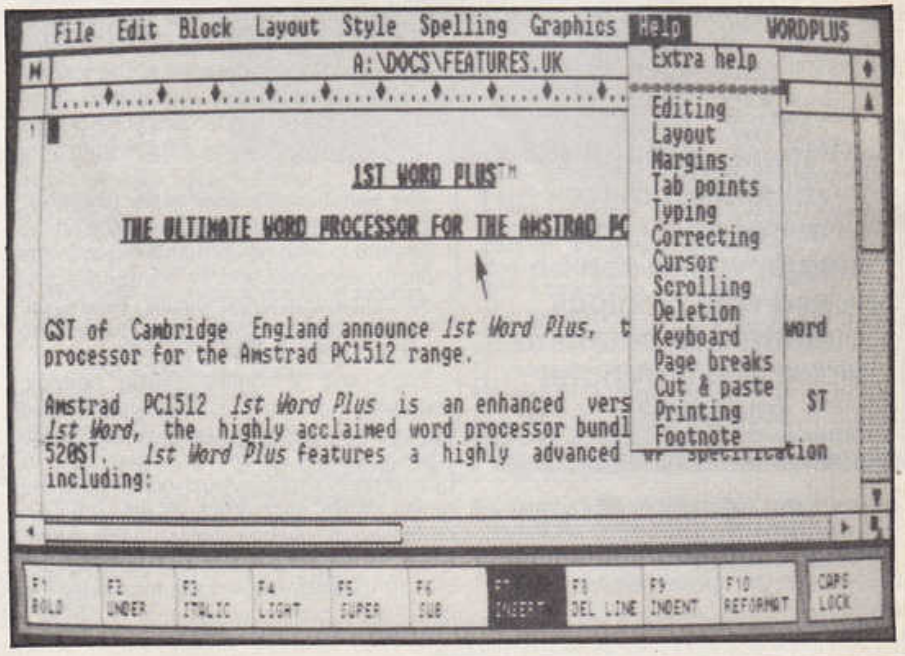
"More unusual is the inclusion of a 40,000 word spell checker. This can either be used retrospectively, or check the words as as you type them"

Deleting words from the main dictionary is performed in a similar manner, with the word to-be deleted first being added to a supplementary dictionary, which must then be edited with *First Word Plus* to place a minus sign immediately before it, and finally this list being merged with the main one. Whilst this system is quite the clumsiest I can imagine, I suppose that it is performed so rarely as not to be a major grumble.

Graphics

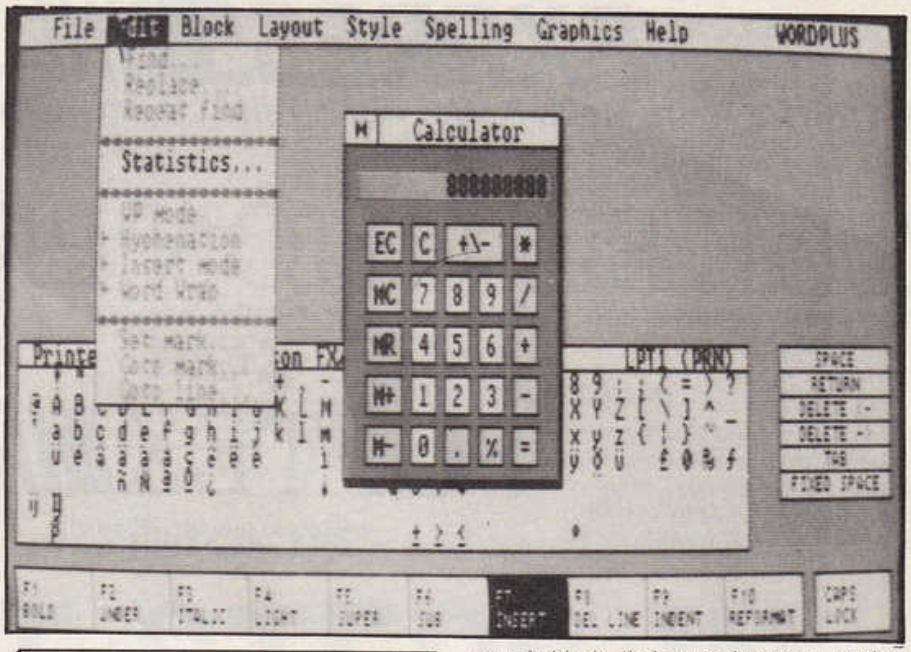
Perhaps more attractive still than the spell checker are the graphics facilities. Although they are in themselves basic, when combined with art programs such as Gem Draw are a very powerful tool indeed.

I suppose GST realised that it couldn't provide the huge variety of drawing tools that different people may need, so instead it has opted for a system where it provide a desktop accessory that can then be used within virtually all Gem art-type programs to capture a picture straight from the screen



and save it to disc for subsequent insertion into a *First Word Plus* document.

Operation of this system is very quick and simple. By virtue of the Gem environment, once you have inserted a picture into your document, you not only see it on the printed output, but also on the screen. Of course, *Snapshot* doesn't care what type of picture you wish to store – it could be a complex graphic or a section from your spread sheet – the only limitation is that it must all fit onto the screen in one go. This system of displaying stuff on screen exactly as it should appear on print-out is known as "What You See Is What You Get", or WYSIWYG, and is really very helpful. It must be remembered though that although both matrix and daisy wheel printers can produce different text styles, daisy wheel printers won't be able to print out any graphics that you may have included in your documents.



Mail merge

Included on the *First Word Plus* discs is the latest version of *First Mail*, which is GST's faithful old mail merging program, again written originally for the Atari ST and therefore making full use of Gem. This has been updated to cope with any graphics in your *First Word Plus* documents, and while not particularly startling it is certainly very capable, offering all the usual facilities such as automatic reformatting after merging with or without right hand justification, and the ability to not only merge a document with data from disc, but also with 'live' data from the keyboard. In the case of disc files, these can be 'nested', that is, one file may refer to the contents of another and so on up to a limit of 20 times.

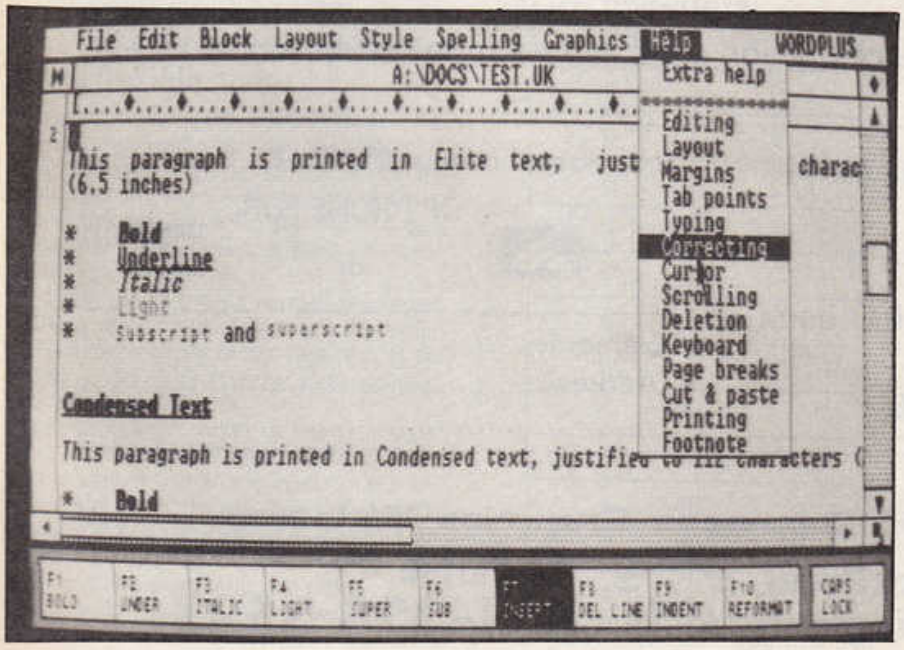
"Operation of the graphics system is very quick and simple. By virtue of the Gem environment, once you have inserted the picture into your document, you not only see it on the printed output, but also on the screen. The only limitation is that it must all fit onto the screen in one go."

Printing

The printer drivers supplied are quite remarkable in their completeness, coping very well with the various text style and graphics as well as the old variants of enlarged and condensed character sets. Printing is performed as a background task so that one may continue to edit a document while printing out another.

A good selection of drivers have been included on the program discs so only people with the more unusual printers or plotters will need to configure their own, or preferably persuade their dealer to customise one specially before purchase.

Unfortunately, GST has not provided the facility to alter line spacing on print out, which means that if one is printing out drafts with double spacing you have to work with your document on screen in double line spacing.



Documentation

The manual supplied is a ring bound, work-you-through guide which is quite thorough and adequately indexed. However there is little technical detail which could make life awkward for those wishing to manipulate *First Word Plus* files in their own programs or indeed configure their own printer drivers.

Conclusions

First Word Plus is quite remarkable in that it is a full function word processor available for the Amstrad PC and compatibles that uses the Gem interface to provide a very user friendly front end to control an unusually powerful program; and to that extent it is highly recommended.

However, because of the hardware limitations of anything but the super fast AT type compatibles, programs running under IBM/Gem perform graphic operations such as scrolling text or selecting menu items at a snail's pace and potential users would be wise to try before they buy to ensure that this will not be unacceptable to them.

SOFTWARE EXPRESS

514-516 Alum Rock Road, Alum Rock, Birmingham Tel.: 021-328 3585

THE ELECTION PROGRAM

FROM

SOFTEX

by I. A. Skelly

- ★ Mouse driven
- ★ Help screens
- ★ Colour maps
- ★ Analysis by region
- ★ Full print-out facilities
- ★ Four types of "swingometer"
- ★ Graph or tabular display
- ★ Turnout statistics
- ★ Edit facility

Conservative	**?**
Labour	**?**
Alliance	**?**
Others	**?**

- ★ Displays by maps and constituency colours
- ★ Evaluates impact of tactical voting
- ★ Identifies constituency of any M.P.
- ★ Identifies and forecasts results in marginal seats
- ★ and many other features

Invaluable aid to politicians, schools, colleges, pollsters, political pundits, researchers and ANYONE with an interest in election results and statistics

A complete database of opinion polls and election results since 1900

520/1040 ST (Colour only)

£29.95 (inc. VAT)

Update discs available after each major election . . .

Phone for details

I enclose a cheque/PO for £ .....

OF PHONE FOR

Access or VISA

Name.....

Address.....

.....

Dealer and Overseas Enquiries Welcome

514-516 Alum Rock Road, Alum Rock, Birmingham

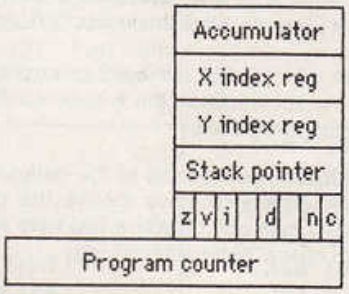
HOTLINE 021-328 3585

FIRST STEPS IN MACHINE CODE

Machine code, and the terms associated with it, often seem daunting. Why worry about it, if you already have a good command of Basic? Kenn Garroch begins a new series in which he explains all those strange codes

Why use machine code when pretty well all micro computers come with a high level language built in? Well, all high level languages, whether they be compiled or interpreted, are written in machine code at the lowest level. The advantages of 'moving on' to machine code are, therefore, speed and flexibility, since there is no mucking around with commands being converted into instructions that the processor can understand directly.

Inside every microprocessor are a number of registers for handling data, a program counter, and a stack pointer. The capabilities and number of the registers vary from processor to processor. For instance, the 6502 is limited to three main data registers and an 8-bit stack pointer. The Z80, on the other hand, appears to be better off with many more registers, a 16-bit stack pointer, and an alternative register set. When it comes down to programming, the differences are more a matter of style than capabilities.



6502 internal registers

More flexible

The way in which the 6502 accesses the memory is more flexible than the Z80 since most operations can be performed direclty on the memory itself. Normally, the Z80 has to load the data into a register before it can be operated on, which means an extra instruction.

All processors have a number of internal sections in common. These are the accumulator or main working register, index registers, a flag register, a stack pointer, and a program counter.

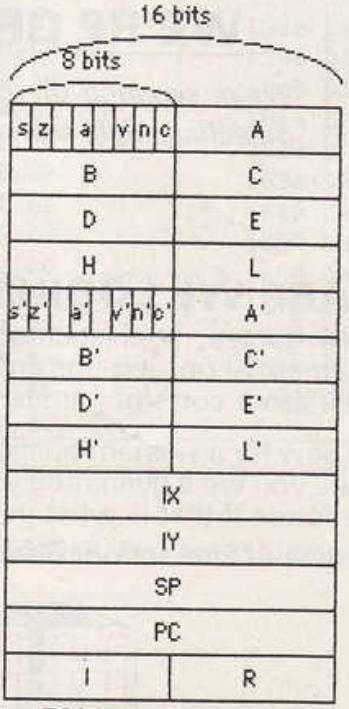
The program counter is used to keep track of which part of the program is to be executed next. In 8-bit processors it is a 16-bit register giving access to 65536 bytes of memory. Putting new values in the program counter allows jumps to be made from one section of the program to the other.

The stack pointer keeps track of the current position of the stack. This is an area of memory set aside for use as temporary quick access storage. The main thing to remember is that when putting a byte on to the stack, it is stored at the position given by the stack pointer. This is then decreased by one to point at the next byte down in memory. When pulling something off the stack, the opposite process is performed.

The stack can, therefore, be termed LIFO (Last In First Out) since this is an apt description of the process. The stack can be used by the programmer with push and pop commands (also known as push and pull) but it is also used by the processor for keeping return addresses in subroutine calls. If something is placed on the stack, it must eventually be taken off again to keep the stack balanced and to prevent it from overflowing.

Flag register

The flag register is used to indicate the status of the processor after an operation. For example, the z (zero) flag will be set (to one) if an operation results in zero otherwise it is reset (to zero). Using the jump and branch on condition commands, the program can transfer control to other sections depending on the state of a flag.



Z80 internal registers

The accumulator is the most important register in any microprocessor. Any addition, subtraction, logical operation, etc, produces a result which is stored in the accumulator. Different processors may have more than one accumulator (the 68000 has eight) but the idea is the same, all results and many operations have to be performed in the accumulator.

The other main registers are for indexing. This is a way of accessing memory using offsets, the value in the index register is added to the address to give the actual address – very useful for tables of data since only the start address is needed, the 10th element can be obtained by placing 10 in the index and loading (the accumulator) using indexed addressing.

The main pieces of hardware common to most micro systems are:

memory – anywhere from 16K to 1024K bytes (1K=1024 or 2^{10});

continued on page 18 ▶

◀ continued from page 17

input – keyboard and disc or cassette;
output – screen and disc or cassette;

The microprocessor has access to all of these and is the main controlling component. The memory is usually split into two sections, Ram (random access memory – sometimes known as read and write memory), and Rom (read only memory).

The only real difference between the two, is that the information in Rom is always there and usually contains the program code to start the system up. Ram is only temporary and when the power is switched off, its contents are lost. The Ram is used to hold programs and data that are currently being worked on by the processor.

Operands

Programs held in memory are a mixture of commands and data. The commands are the most important part since they tell the processor where the data is. Commands are known as op-codes, and the data as operands.

Operands can be either direct data, or a memory address where the data is held (or even the address of an address). At the lowest level these are all 8-bit numbers, since this is the most common method of setting out the memory.

How the processor accesses the memory falls into categories, known as addressing modes and, although these vary from processor to processor, they are:

Implied – there is not data to be obtained from memory although it is 'implied' that there is, eg,

```
CLC     ;Clear the carry flag
```

Immediate – where the data to be used by the instruction, the operand is held in memory directly after the instruction, eg,

```
LDA #2     ;LDA is a 6502 command to
```

load the accumulator, the # denotes the 2 as being immediate.

Absolute – the address of the data to be used by the instruction follows the command in memory, usually a two byte number to give a 16-bit address, eg,

```
LDA 1000    ;Loads the accumulator
```

with the contents of the memory at address 1000.

Indirect – uses the address that follows the instruction as the address of a memory location which holds the address of the data to be operated on. Of the actual two byte address, the lowest is usually pointed to first, eg,

```
LDA (1000)     ;if the memory at 1000
```

and 1001 hold 3 and 2, the actual address of the data to be placed in the accumulator is 2×256+3 = 515.

Register indirect – is the Intel version of indirect and the address of the data is held in a 16-bit register (actually a register pair HL or BC, etc), eg,

```
LD A,(HL)     ;The HL pair holds the
```

address of the memory location where the data to be placed in the A reg is held.

Indexed – adds the contents or an index register to the absolute address following the command in memory. This is then the complete address, eg,

```
LDA 1000,X     ;if X holds 10 then the
```

address is 1010.

Relative – is usually reserved for jumps or branches. The value following the command is an offset that is added to the program counter. The value is signed (highest bit+1 is negative) so only branches of ±127 bytes are usually possible, eg,

```
BEQ 10     ;Jumps forward 10 bytes
```

from the current location if the zero flag is set (to one).

Many processors have other addressing modes, but generally they are a mixture of those listed above. The more powerful the processor, the more powerful the addressing modes it usually has, eg, the 68000 has such niceties as auto-increment and decrement.

Kenn Garroch continues this series next week.

RANARAMA BY STEVE TURNER
JUST ONE OF A STRING OF ORIGINAL HITS FROM

HEWSON

WE'RE GRABBING GAMES!

We're scouring the country, we're looking everywhere. Searching high, searching low. Under every stone, behind every door.

WHAT ARE WE LOOKING FOR?

Games. Computer games. Simple games, sophisticated games. Long games and short games. Quick games and quirky games. Shoot-em-ups and arcade adventures, sports games and combat games. All different sorts of games. You name it, we want it.

If you've got a game, send it to us now for an instant opinion. If we like it we'll pay you well for a good job well done. And if we like you we'll guarantee you original and/or conversion work for the future if that is what you want.

So grab yourself a piece of the action. Send your game NOW to:

Mr Andrew Hewson,
Managing Director,
Hewson Consultants Limited,
56B Milton Trading Estate,
Milton, Abingdon, Oxon
(0235) 832939

HEWSON

Register Loader

Jeff Walker

This machine code program will allow you to load Z80 registers from Basic, thereby enabling the user to call firmware routines that are otherwise not available.

The new RSX's are as follows.

:*LDA,n* load *n* into A register.
:*LDB,n* load *n* into B register.
:*LDC,n* load *n* into C register.
:*LDD,n* load *n* into D register.
:*LDE,n* load *n* into E register.
:*LDH,n* load *n* into H register.
:*LDL,n* load *n* into L register.
:*LDBC,n* load 16-bit *n* into BC.
:*LDDE,n* load 16-bit *n* into DE.
:*LDHL,n* load 16-bit *n* into HL.
:*FWCALL,n* calls the firmware routine at address *n*. This should be done after loading the relevant registers using the RSX's above.
:*REGS* prints the contents of all the registers, including the states of all the flags (use this command in direct mode).
:*FLAGS* prints just the state of the flags.

```
1 'REGILOAD Hex Loader
2 '
10 MEMORY &9EFF
20 FOR addr=&9F00 TO &A137
30   READ b$:POKE addr,VAL("&"+b$)
40   checksum=checksum+VAL("&"+b$)
50 NEXT
60 IF checksum<>65133 THEN 80
70 CALL &9F00:SAVE"regiload.bin",b,
&9F00,&238:END
80 PRINT"ERROR in DATA":STOP
90 '
1000 DATA 01,0A,9F,21,BE,A0,CD,D1
1010 DATA BC,C9,33,9F,C3,64,9F,C3
1020 DATA 6E,9F,C3,78,9F,C3,82,9F
1030 DATA C3,8F,9F,C3,99,9F,C3,A3
1040 DATA 9F,C3,B0,9F,C3,BA,9F,C3
1050 DATA C4,9F,C3,D1,9F,C3,01,A0
1060 DATA C3,60,A0,4C,44,C1,4C,44
1070 DATA C2,4C,44,C3,4C,44,42,C3
1080 DATA 4C,44,C4,4C,44,C5,4C,44
1090 DATA 44,C5,4C,44,C8,4C,44,CC
1100 DATA 4C,44,48,CC,46,57,43,41
1110 DATA 4C,CC,52,45,47,D3,46,4C
1120 DATA 41,47,D3,00,CD,A3,A0,DD
1130 DATA 7E,00,32,B7,A0,C9,CD,A3
1140 DATA A0,DD,7E,00,32,B9,A0,C9
1150 DATA CD,A3,A0,DD,7E,00,32,B8
1160 DATA A0,C9,CD,A3,A0,DD,66,01
1170 DATA DD,6E,00,22,B8,A0,C9,CD
1180 DATA A3,A0,DD,7E,00,32,BB,A0
1190 DATA C9,CD,A3,A0,DD,7E,00,32
1200 DATA BA,A0,C9,CD,A3,A0,DD,66
1210 DATA 01,DD,6E,00,22,BA,A0,C9
1220 DATA CD,A3,A0,DD,7E,00,32,BD
1230 DATA A0,C9,CD,A3,A0,DD,7E,00
1240 DATA 32,BC,A0,C9,CD,A3,A0,DD
1250 DATA 66,01,DD,6E,00,22,BC,A0
1260 DATA C9,CD,A3,A0,3A,B7,A0,ED
1270 DATA 4B,B8,A0,ED,5B,BA,A0,2A
1280 DATA BC,A0,E5,DD,6E,00,DD,66
1290 DATA 01,22,EE,9F,E1,CD,00,00
1300 DATA ED,43,B8,A0,ED,53,BA,A0
1310 DATA 22,BC,A0,F5,E1,22,B6,A0
1320 DATA C9,CD,4A,A0,3A,B7,A0,21
1330 DATA 09,A1,CD,87,A0,3A,B9,A0
1340 DATA 21,DD,A0,CD,87,A0,3A,B8
1350 DATA A0,21,DF,A0,CD,87,A0,3A
1360 DATA BB,A0,21,EC,A0,CD,87,A0
1370 DATA 3A,BA,A0,21,EE,A0,CD,87
1380 DATA A0,3A,BD,A0,21,FB,A0,CD
1390 DATA 87,A0,3A,BC,A0,21,FD,A0
1400 DATA CD,87,A0,21,D2,A0,CD,AC
1410 DATA A0,C9,CD,6A,A0,21,18,A1
1420 DATA 3A,B6,A0,06,08,23,17,DC
1430 DATA 83,A0,D4,7F,A0,10,F6,C9
1440 DATA CD,4A,A0,21,0B,A1,CD,AC
1450 DATA A0,C9,CD,11,BC,C6,01,32
1460 DATA DC,A0,32,EB,A0,32,FA,A0
1470 DATA 32,08,A1,32,18,A1,C9,0E
1480 DATA 30,71,C9,0E,31,71,C9,5F
1490 DATA 0F,0F,0F,0F,E6,0F,CD,98
1500 DATA A0.7B,E6,0F,CD.98,A0,C9
1510 DATA FE,0A,38,02,C6,07,C6,30
1520 DATA 77,23,C9,FE,01,C2,A9,A0
1530 DATA C9,21,C2,A0,7E,FE,00,C8
1540 DATA CD,5A,BB,23,18,F6,00,00
1550 DATA 00,00,00,00,00,00,00,00
1560 DATA 00,00,50,61,72,61,6D,65
1570 DATA 74,65,72,20,65,72,72,6F
1580 DATA 72,00,0A,0A,0D,0F,01,42
1590 DATA 43,3D,26,0F,02,30,30,30
1600 DATA 30,20,20,20,0F,01,44,45
1610 DATA 3D,26,0F,02,30,30,30,30
1620 DATA 20,20,20,0F,01,48,4C,3D
1630 DATA 26,0F,02,30,30,30,30,20
1640 DATA 20,20,0F,01,41,3D,26,0F
1650 DATA 02,30,30,0A,0A,0D,0F,01
1660 DATA 46,6C,61,67,73,3A,20,0F
1670 DATA 02,30,30,30,30,30,30,30
1680 DATA 30,0A,0D,0F,01,20,20,20
1690 DATA 20,20,20,20,53,5A,2D,48
1700 DATA 2D,50,4E,43,0A,0A,0D,00
```

```
100 'REGISTER LOADER DEMO
110 '
120 '(demonstrates how to use REGILOAD to use 3 firmware calls)
130 '
140 '
150 MEMORY &3FFF
160 LOAD"regiload.bin",&9F00
170 CALL &9F00
```

continued on page 20 ▶

◀ continued from page 19

```
180 '
190 '
200 MODE 1
210 GOSUB 370 'fill some rectangles with colour on the screen
220 PRINT "PRESS SPACE":LOCATE 1,25:PRINT"SCREEN MEMORY LOW"
230 GOSUB 490 'store a screen in memory at address &4000
240 MODE 1
250 GOSUB 370 'fill some rectangles with colour on the screen
260 PRINT "PRESS SPACE":LOCATE 1,25:PRINT"SCREEN MEMORY HIGH"
270 WHILE INKEY$<>" ":WEND
280 |LDA,&40:|FWCALL,&BC08 'set screen memory low
290 WHILE INKEY$<>" ":WEND
300 |LDA,&C0:|FWCALL,&BC08 'set screen memory high
310 GOTO 270
320 '
330 '
340 '-------------------------------------------------------------
350 'SUBROUTINE: to fill some rectangles with colour on the screen
360 '-------------------------------------------------------------
370 FOR loop=1 TO 50          'do it a few times
380   |LDA,INT(RND*255)+1     'ink mask
390   |LDH,INT(RND*25)        'left-hand column
400   |LDD,INT(RND*14)+25     'right-hand column
410   |LDL,INT(RND*13)        'top row
420   |LDE,INT(RND*12)+13     'bottom row
430   |FWCALL,&BC44           'SCR FILL BOX
440 NEXT
450 RETURN
460 '
470 '
480 '-------------------------------------------------------
490 'SUBROUTINE: to store a screen in memory at address &4000
500 '-------------------------------------------------------
510 |LDBC,&4000      'amount of memory to move
520 |LDHL,&C000      'where to move it from
530 |LDDE,&4000      'where to move it to
540 |FWCALL,&B91B    'KL LDIR
550 RETURN
560 '
570 '
580 '-------------------------------------------------------------
590 'SUBROUTINE: to restore the state of the registers (including the
600 '            carry & zero flags) into their respective variables
610 '            so that tests may be carried out on them from Basic.
620 '-------------------------------------------------------------
630 a=PEEK(&A0B7):f=PEEK(&A0B6):b=PEEK(&A0B9):c=PEEK(&A0B8)
640 d=PEEK(&A0BB):e=PEEK(&A0BA):h=PEEK(&A0BD):l=PEEK(&A0BC)
650 bc=b*256+c:de=d*256+e:hl=h*256+l
660 carry=(f AND 1):zero=(f AND 127)
670 RETURN
```


Micromon

P A Fairclough

Micromon enters its third week with another large chunk of the listing (not much left now) and the remainder of the instructions. A table of useful address locations appears next week.

T – Transfer.

Format : *T addr,addr,addr,addr*

Transfer will transfer a block of memory, specified by the first two addresses, to another address, starting at the last address.

This is an intelligent transfer as the block may be copied up or down in memory.

V – Verify.

Format : *V "filename",device,addr*

Verify will verify a file which has just been saved. This command is identical to the *Load* command in format and use.

continued on page 22 ▶

G.T. COMPUTERS

Wales Largest Independent Retail Outlet

* Part exchange welcome
* All prices inc. VAT: excl. P.&.P.
* All computer repairs undertaken

* USED *	£	* NEW *	£
Spectrum 48k	39.99	Spectrum 128	79.99
Spectrum 48k Plus	49.99	Spectrum 128+2	119.00
Spectrum 128	59.99	Commodore 64	150.00
Spectrum 128+2	89.00	Commodore 64 Connosseur	189.00
Commodore 64 inc. Rec.	110.00	Commodore 128	199.00
MPS 803 Printer	119.00	Commodore 128D	359.00
Commodore 128 inc. Rec.	150.00	1541C Disc Drive	150.00
Commodore 1541 Disc Drive	99.00	Amstrad 464 inc. Mod.	179.00
MPS801 Printer	79.99	Amstrad 464 inc. Col. Mon.	279.00
Amstrad 464 inc. Mod.	99.99	Amstrad 6128 inc. Mod.	279.00
Amstrad 464 inc. Col. Mon.	189.00	Amstrad 6128 inc. Col. Mon.	360.00
Amstrad 6128 inc. Mod.	199.00	Amstrad PCW8256	430.00
Amstrad 6128 inc. Col. Mon	279.00	Amstrad PCW8512	530.00
Amstrad PCW8256	350.00	Amstrad PC1512SM	499.00
Amstrad PCW8512	450.00	Amstrad PC1512DC	799.00
DMP2000 Printer	110.00	Amstrad PC1512/HD20M	999.00
FD-1 Disc Drive	70.00	Amsoft 3" discs (per 10)	29.99
DD-1 Disc Drive	110.00	Cumana 40/80 Disc Drive	150.00
BBC Model B Series 7	199.00	Opus 40T Disc Drive	69.99
BBC Model B inc. DFS	249.00	1050 Disc Drive	120.00
Acorn Electron	45.00	Atari Data Recorders	24.99
Atari 800XL	45.00	Atari 520STM	249.00
Atari 130XE	79.00	Atari 520STFM	359.00
Atari 520ST	189.00		
Atari 520STFM	310.00		

* NEW *

Cheetah 125+ joystick £5.99 – Spectrum joystick interface £7.99 – Spectrum light pen £12.95 – Spectrum power supplies £6.50 – Commodore power supplies £19.99 – Commodore data recorders £19.99 – Large range of used disc drives, printers, monitors, add-ons available.

ALL CHEQUES to made payable to: G.T. COMPUTERS LTD.
21 Charles Street, Newport, Gwent. Tel: (0633) 216654
133 City Road, Cardiff, Glam. Tel: (0222) 483038

WE DON'T SELL CHEAP COMPUTERS!
WE SELL OUR COMPUTERS CHEAP!

STRATEGIC PLUS SOFTWARE

P.O. Box 8, Hampton, Middx TW12 3XA.

EPSON PC systems	RRP £	OUR £
Epson PC Mono Monitor, 2 floppy, 512K	1015	658
Epson PC Mono Monitor, 1 floppy, 512K & 20Mb hard disc	1457	908
Epson PC Colour Monitor, 2 floppy, 512K	1369	929
Epson PC Colour Monitor, 1 floppy, 512K & 20Mb hard disc	1811	1179
Epson PC Plus systems		POA
PRINTERS		
Epson LX-86 (inc. tractor feed)	297	199
Epson EX-800 (inc. tractor feed)	555	475
Epson LQ-800 (inc. tractor feed)	669	499
Epson LQ-1000 (inc. tractor feed)	890	632

If purchased with the system, printer cables are included.

Prices include UK mainland delivery. Please add VAT @ 15%.

Phone for a catalogue of software/hardware, both business & recreational.

VISA **01-979 2987**

IT'S HERE AT LAST!
The show that tells you everything about the exciting world of Commodore computing!

10th Official Commodore computer show

10am to 6pm Friday June 12
10am to 6pm Saturday June 13
10am to 4pm Sunday June 14

Champagne Suite & Exhibition Centre
Novotel, Hammersmith, London W6

- ★ **Test drive the very latest games in the Commodore Games Arcade.**
- ★ **Join in live demos of the new generation of computer music.**
- ★ **Browse through the library of business software in an adults only section.**
- ★ **Meet Jim Butterfield and many other top experts in the Commodore theatre.**

Send for your advance tickets TODAY. With them you can walk past the queues – and SAVE £1 per head off normal prices!

Advance ticket orders

Please supply:

☐ Adult tickets at £2 (save £1) £____

☐ Under-16s tickets at £1 (save £1) £____

Total £____

☐ Cheque enclosed made payable to Database Publications Ltd.

☐ Please debit my credit card account

Access Visa

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Admission at door: £3 (adults), £2 (under 16s)

Advance ticket orders must be received by Friday, June 5

10th Official Commodore computer show **June 12-14 1987**

Post to **Commodore Show Tickets, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.**

Name

Address

Signed

PHONE ORDERS: Show Hotline: 061-480 0171
PRESTEL ORDERS: KEY *89, THEN 614568383
MICROLINK ORDERS: MAILBOX 72:MAG001
Please quote credit card number and full address

◀ continued from page 20

W – Walk.

Format : *W*
or *W,addr*

Walk allows the user to execute a program one instruction at a time starting at the PC or an address if given. The first instruction is not displayed but the second and subsequent instructions are.

If a *BRK* instruction is encountered then command is halted and the registers displayed. If the *STOP* key pressed the command is terminated.

When a key is pressed the displayed instruction is executed and the next instruction is displayed.

If 'J' is pressed when a *JSR* instruction is displayed the whole subroutine is executed at normal speed (don't do it when there isn't one!). Walk does not use the Breakpoint command.

X – Exit.

Format : *X*

Exit will exit from the machine code monitor and enter BASIC. I do not guarantee BASIC will work properly.

```
10347 DATA19,86,43,AD,77,02,A6,D6,900
10348 DATAC9,11,F0,09,C9,91,D0,04,1025
10349 DATAE0,00,F0,4C,60,E0,18,D0,1092
10350 DATAFB,20,0C,CA,F0,0B,A9,28,957
10351 DATA20,9D,C3,C6,43,D0,F2,F0,1339
10352 DATAEB,20,EC,CB,B0,E6,A5,19,1302
10353 DATAC9,3A,F0,0F,C9,27,D0,16,984
10354 DATAA9,0F,20,9F,C3,20,20,C4,830
10355 DATA4C,2F,CB,A9,07,20,9F,C3,888
10356 DATA20,EF,C8,4C,2F,CB,20,B4,1009
10357 DATAC3,20,99,C3,20,11,C3,A9,988
10358 DATA00,85,C6,85,28,4C,E3,CB,1010
10359 DATA20,0C,CA,F0,0A,A9,27,20,736
10360 DATA9F,C3,C6,43,D0,F2,60,20,1197
10361 DATAEC,CB,B0,A0,20,A6,CB,A5,1341
10362 DATA19,C9,3A,F0,0F,C9,27,D0,987
10363 DATA16,A9,10,20,9D,C3,20,23,658
10364 DATAC4,4C,2F,CB,A9,08,20,9D,888
10365 DATAC3,20,F2,C8,4C,2F,CB,A5,1160
10366 DATAC1,A6,C2,85,C3,86,C4,A9,1380
10367 DATA10,85,43,38,A5,C3,E5,43,928
10368 DATA85,C1,A5,C4,E9,00,85,C2,1247
10369 DATA20,B4,C3,20,99,C3,20,8C,959
10370 DATAC1,F0,06,B0,F3,C6,43,D0,1331
10371 DATAE2,E6,20,A5,20,20,9D,C3,1069
10372 DATA20,14,C3,4C,2F,CB,A9,00,742
10373 DATA85,AE,85,AC,A9,DB,85,AF,1308
10374 DATA85,B1,AD,88,02,18,69,03,753
10375 DATA85,AD,85,C4,A9,28,85,C3,1172
10376 DATA85,B0,A0,BF,A2,04,B1,AC,1175
10377 DATA91,C3,B1,AE,91,B0,88,C0,1340
10378 DATAFF,D0,F3,C6,AD,C6,C4,C6,1669
10379 DATAAF,C6,B1,CA,D0,E8,A9,0A,1371
10380 DATA20,E4,C0,A0,00,84,C7,84,1075
10381 DATAD4,4C,0E,E5,85,19,C0,28,921
10382 DATA38,F0,22,20,2F,CC,C9,20,846
10383 DATAF0,F4,88,20,16,CC,85,C1,1204
10384 DATA86,C2,A9,FF,85,CC,A5,CF,1461
10385 DATAF0,0A,A5,CE,A4,D3,91,D1,1350
10386 DATAA9,00,85,CF,18,60,20,1A,687
10387 DATACC,AA,20,2F,CC,20,3B,CC,952
10388 DATA0A,0A,0A,0A,85,2A,20,2F,294
10389 DATACC,20,3B,CC,05,2A,60,B1,819
10390 DATAC1,C8,29,7F,C9,20,B0,02,972
10391 DATA09,40,60,C9,3A,29,0F,90,628
10392 DATA02,69,08,60,A2,02,D0,02,585
10393 DATAA2,00,08,20,58,CC,20,CF,733
10394 DATAC0,A2,00,A1,09,4C,17,C2,817
10395 DATAB5,C2,85,0A,B5,C1,85,09,1034
10396 DATA60,20,83,CC,A0,00,08,20,663
10397 DATACF,C0,B1,C1,4C,17,C2,A9,1231
10398 DATA00,F0,02,A5,13,20,83,CC,793
10399 DATAA0,00,08,20,CF,C0,91,C1,937
10400 DATA4C,17,C2,A4,0F,84,C1,A4,961
10401 DATA10,84,C2,60,20,98,CC,E6,1056
10402 DATA21,A4,C2,F0,02,E6,21,60,992
10403 DATAC9,30,90,50,C9,3A,B0,4C,984
10404 DATAA0,00,84,C1,84,C2,4C,CC,1091
10405 DATACC,A5,C1,A4,C2,06,C1,26,1157
10406 DATAC2,B0,39,06,C1,26,C2,B0,1034
10407 DATA33,65,C1,85,C1,98,65,C2,1118
10408 DATA85,C2,B0,28,06,C1,26,C2,974
10409 DATAB0,22,A5,1E,29,0F,18,65,586
10410 DATAC1,85,C1,A9,00,65,C2,85,1116
10411 DATAC2,B0,11,20,CF,FF,C9,30,1130
10412 DATA90,08,C9,3A,B0,04,85,1E,754
10413 DATA90,BF,38,60,4C,92,C0,20,933
10414 DATA15,C6,85,C1,20,15,C6,C9,997
10415 DATA22,D0,F1,60,A9,00,85,C2,1075
10416 DATA20,15,C6,F0,F7,C9,25,F0,1216
10417 DATA0D,C9,24,F0,25,C9,22,F0,1002
10418 DATA1C,20,98,CC,B0,30,20,15,693
10419 DATAC6,20,AA,C9,85,C1,AA,20,1129
10420 DATA1D,C6,F0,22,86,C2,20,AA,1031
10421 DATAC9,85,C1,D0,19,20,EF,CC,1235
10422 DATAF0,14,20,D7,C8,85,C1,AA,1203
10423 DATA20,1D,C6,F0,09,86,C2,20,868
10424 DATADC,C8,85,C1,D0,00,A2,00,1116
10425 DATA20,66,C1,A5,C2,F0,03,20,961
10426 DATA92,C8,20,90,C8,20,B7,CD,1142
10427 DATAA2,02,20,66,C1,A5,C2,F0,1090
10428 DATA03,20,72,C9,A5,C1,20,72,854
10429 DATAC9,20,B7,CD,A2,03,20,66,920
10430 DATAC1,A5,C1,20,70,C3,A2,01,1053
10431 DATA20,66,C1,A0,00,A2,2F,E8,928
10432 DATA38,A5,C1,F9,5B,CE,85,C1,1286
10433 DATAA5,C2,F9,5C,CE,85,C2,B0,1409
10434 DATAEE,A5,C1,79,5B,CE,85,C1,1340
10435 DATAA5,C2,79,5C,CE,85,C2,C8,1305
10436 DATAC8,8A,20,E4,C0,C0,08,D0,1198
10437 DATAD4,A5,C1,18,69,30,20,E4,1007
10438 DATAC0,20,E2,C0,4C,97,C0,A2,1223
10439 DATA08,4C,7D,C3,A9,C0,20,90,941
10440 DATAFF,A0,02,84,BC,88,84,B9,1190
10441 DATA84,BA,88,84,90,84,93,84,1141
10442 DATAB7,84,BB,20,1D,C6,F0,37,1056
10443 DATAC9,20,F0,F7,C9,40,F0,15,1246
10444 DATAC9,22,D0,0E,20,15,C6,C9,909
10445 DATA22,F0,15,91,BB,E6,B7,C8,1240
10446 DATAD0,F2,4C,92,C0,20,C6,C8,1294
10447 DATA85,BB,86,BC,A9,BB,85,B7,1314
10448 DATA20,1D,C6,F0,0A,20,D7,C8,956
10449 DATA85,BA,20,1D,C6,D0,1D,A0,975
10450 DATA00,A5,19,C9,53,F0,DB,C9,1134
10451 DATA4C,F0,01,C8,98,A6,C1,A4,1192
10452 DATAC2,20,D5,FF,B0,CC,A5,90,1383
10453 DATAD0,C8,F0,2C,20,70,C8,C6,1234
10454 DATAB9,20,1D,C6,F0,D9,20,C6,1131
10455 DATAC8,85,AE,86,AF,20,1D,C6,1075
10456 DATAF0,05,20,D7,C8,85,B9,A5,1175
10457 DATA19,C9,53,D0,A5,20,E2,C0,1132
10458 DATAA9,04,20,90,FF,20,EA,F5,1115
10459 DATA4C,97,C0,10,27,E8,03,64,809
10460 DATA00,0A,00,40,02,45,03,D0,356
10461 DATA08,40,09,30,22,45,33,D0,491
10462 DATA08,40,09,40,02,45,33,D0,475
10463 DATA08,40,09,40,02,45,B3,D0,603
10464 DATA08,40,09,00,22,44,33,D0,442
10465 DATA8C,44,00,11,22,44,33,D0,586
10466 DATA8C,44,9A,10,22,44,33,D0,739
```

POPULAR Computing WEEKLY

SPECIAL supplement

1987
5–11 June

THE BBC MICRO

INSIDE

24
Latest games titles reviewed in depth

26
PMS' Genie desktop accessory package

32
Music 500 revised and expanded

33
Save money on Watford's new mouse

34
Spelling checker and graph plotter from Computer Concepts assessed

While Acorn talks enthusiastically of advanced RISC technology and business systems, owners of the relatively humble BBC B are still finding new and remarkable applications for this popular machine.

In this supplement we look at products which bring the Beeb up into the field of WIMPs, including PMS' **Genie** desktop accessories, and Watford's mouse and paint program, on which you can save £10 with our special offer.

There's also a look at programs to improve your BBC's document output; Computer Concepts' useful spelling-checker and graph plotter packages.

The long-awaited release of the latest version of the powerful **Music 5000** system is previewed, and as usual we round up the latest games. ◀

Chartists

Minerva's latest product, **System Gamma,** claims to be the first programmable business graphics package for the BBC which allows non-programmers to produce sophisticated customised charts.

Formats supported include scatter, histogram, line, bar and pie charts, which are definable in terms of scale, screen position and labelling.

Data can be imported from Minerva's **System Delta** database, and the built-in statistics facility allows standard deviation, line of best fit and other techniques to be applied to the graphs.

Menu-driven, and compatible with BBC Basic commands, System Gamma costs £45.95 and is available from Minerva Systems, 69 Sidwell Street, Exeter, Devon EX4 6PH, 0392-37756. ◀

Sideset system

FMS's **Genie,** reviewed in this supplement, isn't the only desktop accessory program available for the BBC. Just out from Maze Technology is **Sideset,** an "interactive windowed task-switching system".

Sideset allows immediate switching between the user's main application and the new utilities provided, and also allows switching between two or more different applications; for instance a BBC Basic program and View.

The program works by freezing one application and bringing up the other selected in a nested window. The number of tasks which can be suspended at one time is only limited by the capacity of the disc filing system.

Sideset comes on ROM and uses the DFS or ADFS disc system on the BBC B or the Master. Utilities provided include diary, calculator, address-book, and notepad, with more in development.

Launch price is £39.95; contact Maze Technology at 11 Braemar Avenue, Neasden, London NW10 0DY, 01-452 8372. ◀

Silver bird

Firebird's Silver budget games range continues to support the BBC/Electron, with the latest title **Birdstrike** due out soon. You control an aircraft attempting to shoot down enemy bombers. Each aircraft must be hit exactly in the centre to score a kill.

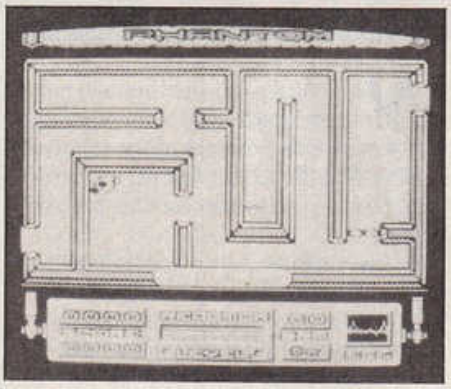
When enough planes are destroyed, a carrier pigeon is released; shooting this earns you a musical note. Complete the tune on the stave at the top of the screen to earn a bonus and get onto the next level.

Birdstrike costs £1.99; more from Firebird on 01-379 6755. ◀

GAMES TO WATCH

DUNCAN EVANS WADES THROUGH THE LATEST FLOOD OF BIG NAME GAMES FOR THE BBC

PHANTOM



It doesn't take much to work out where Dave Croft got his inspiration for **Phantom.** Phantom sports graphics depicted from directly overhead, where nasty ghosts and beasties lurk in gloomy corridors and you, as Professor of Astro-Physics must destroy the lot of them with your experimental nuclear accelerator.

That's the plot in a nutshell really. You must clear the four buildings of all things supernatural by frying the fiends.

Control is by keyboard or joystick, and consists of four movement directions and fire. The problem with your nuclear blaster is that it runs out of power fairly quickly, so collection of spare isotope power packs is essential. The other thing to watch out for is your heart rate. Too much contact with the netherworld spirits will send it over the 100 BPM limit. This is fatal.

While graphics and animation are reasonable, the sound effects are pretty rudimentary, adding little to the action.

It's quite easy to get past the first couple of screens, but then your heart starts to fail with alarming regularity. In order to get anywhere you must be as fast as possible and avoid those clammy touches. Should you wait, pondering your course of action, then in the twinkling of an eye you'll be knee deep in all things ghostly.

If 2D arcade maze shooting games are up your street then I think you'll find Phantom just dandy. ◀

Program Phantom
Price £6.95 (cassette), £8.95 (disc)
Supplier Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne & Wear

THE BIG K.O.

Boxing games may not be the in thing anymore, but there aren't that many out on the BBC so Tynesoft's is certainly welcome.

The Big K.O. pits you against either another human player or against any of eight computerised foes. The keys, which are redefinable, used in play are left and right, and arms up or down, and punch. If you hold your gloves up it protects your head, while holding them down protects the body. Alas you must hold them in a middle position in order to punch.

After sitting through the introductions, which tell you which type of punch each boxer is best at, and can be turned off anyway, the ring appears and a pair of boxing gloves start the contest.

The fight lasts for three rounds or until one boxer is flattened, whichever happens first. If there's no knockout then points decide the winner. For each round a boxer has a certain amount of energy which diminishes every time a punch is thrown, and more substantially when you are hit. If your opponent's energy runs out first, you can beat him senseless because he cannot defend himself.

While the large sprites do tend to plod around rather than dance like a butterfly, the animation is flickerless and the action fast, furious and funny. Recommended. ◀

Program The Big K.O.
Price £6.95 (cassette), £8.95 (disc)
Supplier Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne & Wear

MAGIC II

Since the success of the **Magic I** collection, Micropower has decided to re-issue some more of the back catalogue in the form of **Magic II.**

For a reasonable eight quid you get a disc containing ten Original Hits, as it says on the package. Ah yes, **Junior Maths Pack,** I remember the queues that formed for that one. That, **World Geography** and **Helldriver** are really just a waste of space.

Positron, Bandits and **Frenzy** are average clones of Space Invaders, Fighter Pilot and Quix.

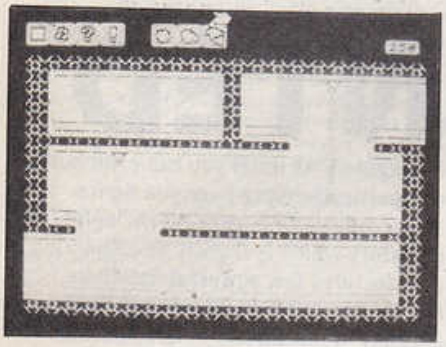
The best is undoubtedly **Mr Ee,** based on **Mr Do** from the arcades, and is excellent. The graphics are bright and colourful, the tunes are jolly and enhance the action (and can be turned off), and the game itself is addictive, challenging and entertaining. You can't ask for more than that really.

Cybertron Mission is a one player

IMOGEN

Imogen combines elements of other styles of games and fuses them together to produce a game that could have been quite good.

The idea is that Imogen, the mighty wizard, helped destroy a great evil, but the strain was too much and he went bonkers. An even bigger wizard imprisoned him and split the spell for his



release into sixteen parts, which he would collect when his sanity returned, and thus be able to escape. Great idea, isn't it? I think we should try it out round at the Maze.

So that's the quest, find the sixteen bits and escape. The game is presented in 2D platform and ladders style, with lots of leaping to and fro to get round the obstructions. To help you do this you can mutate into a cat (good jumper), a monkey (great climber) and back into your own good wizardly self (for spellcasting and using objects).

The trick to Imogen is to use the right character at the right time, to get round the problems. What's disappointing about Imogen is the quality of graphics, animation and sound. The sound is minimal, so forget that. The graphics are presented in monochrome (Mode 4). To compensate for the lack of colour you'd expect to get a good deal of detail. Unfortunately, not so.

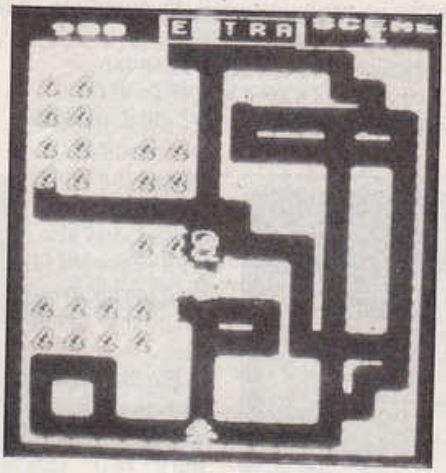
The animation as well is unforgivably

bad; there's hardly anything else moving on screen, and yet the sprites flicker when moved and you can see the background through them. These points really do detract from an otherwise decent game. ◀

Program Imogen
Price £9.95 (disc) **Supplier** Micro Power, Northwood House, Leeds LS7.

Gauntlet style game from a few years ago, nothing special in the sound or graphics department but good fun nevertheless.

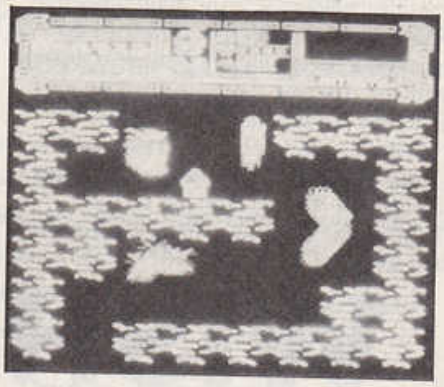
The remaining two, **Chess** and **Felix** (platforms and ladders), are both routine implementations and quite playable in their own right.



If you don't have Mr Ee already, then this collection is worth buying just because of that one game. ◀

Program Micropower Magic II
Price £7.95 (disc)
Supplier Micropower, Northwood House, Leeds LS7

STARQUAKE



With a hero called Blob I don't think the folks at Bubble Bus are being entirely serious on the plot aspect of Starquake. It runs along the lines of "unstable planet emerges from black hole on edge of galaxy, unless middle of planet re-built, then boom." Book your seats for the fireworks.

Basically, it's an arcade adventure set in space, although the scenery is so nondescript it could be in the bottom of your garden and you'd never notice. You move Blob around, firing at hostile thingies until your Nevereadv battery runs out, and collect the objects which are scattered about.

What you do then is anybodies' guess because the instructions certainly offer no insights. There are five hundred rooms to zip around, so there's plenty to explore.

Teleport pads and flying platforms add to the complexities involved; you'll certainly need to make a map!

Although the Beeb's limitations mean that the graphics and sound are inferior to those of the CBM64 and Amstrad versions, there's a good game hidden away in Starquake; pity it's a bit pricey. ◀

Program Starquake
Price £9.95/£11.95 **Suplier** Bubble Bus Software, 87 High Street, Tonbridge, Kent TN9 1RX.

One of the features of many sophisticated micros is the ability to utilise desk top accessories. That is to say, routines incidental to the main program which can be called upon at any time, perform a function, then disappear again, without affecting the main program at any time. A few examples would be a calculator, address book and notepad.

For the hard pressed serious BBC user Permanent Memory Systems of East Kilbride has produced **Genie,** a hardware and software equivalent.

WISHES GRANTED

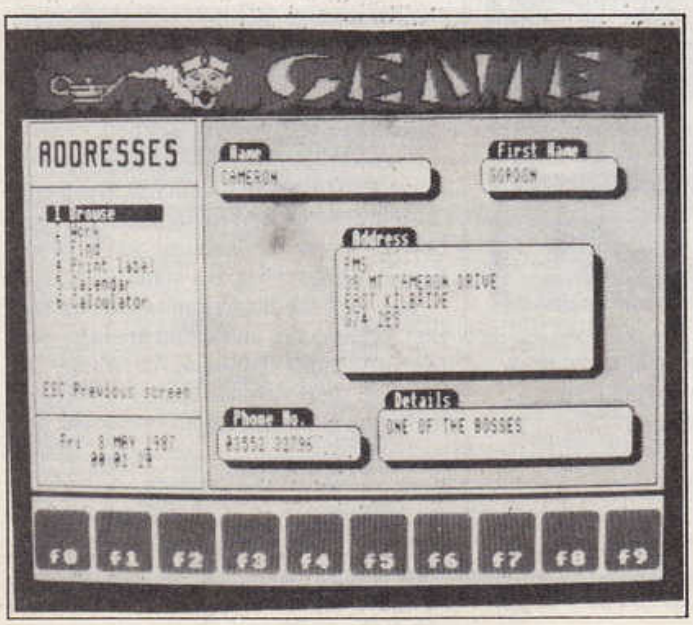
DUNCAN EVANS REVIEWS PMS' IN-GENIE-OUS SOLUTION TO THE PROBLEM OF IMPLEMENTING DESKTOP ACCESSORIES ON THE BEEB, AND FINDS THAT AT LEAST SIX OF HIS WISHES ARE GRANTED . . .

The software simply consists of a 'Genie Formatter' disc, and only needs to be run once with the hardware in place in order to correctly configure it. Once this is done the disc can be disposed of as you wish!

The hardware part of Genie consists of a small plastic box with a trailing lead which connects to a Rom socket on the BBC's circuit board. Inside the plastic box lies 32k of battery backed Ram in which user data is stored, a 32k Eprom containing the system software, and an additional 32k of Ram which is used by the system software. All of this appears to the computer as a single 16k Rom.

The actual facilities offered by Genie are an address book, desk diary, notepad, phone book, calendar and calculator.

The utilities can be called up at any time, regardless of what mode the computer was in at the time, by pressing Control-Shift-G or entering *Genie if permissible. Once called, the main menu, which is pleasantly designed, appears with the options listed down the left side, the main work area to the right of it and the function key strip along the bottom.



First accessory on the list is the address book which lets you enter surname (24 characters), forenames (14 characters), address (six lines of 30), telephone number (15 characters) and sundry comments in the details box (two lines of 30).

Once the information is entered it is automatically sorted, and you can now browse, work, find, print label or go to the calendar or calculator. Pressing Escape stores any new data in the permanent memory, ready for recall the next time Genie is accessed.

Before you call up the calendar accessory it's a good idea to go to the options menu first and set the date. While there you can change the colour scheme if so desired, and also set a password to keep prying eyes out of your Genie files.

Having set the date you can wander through the 99 year calendar, looking for particular days or whatever. You should note that the calendar can be accessed from the address book, notepad and desk diary.

The second facility, the notepad, lets you browse through the clearly labelled pages (16 lines of 40 characters), scribble away word processor style (ie automatic word wrap), find a page and print a page.

The desk diary is quite easy to use, and commences with you being offered the chance to enter some reminder for the current day. Whether you take up the offer or not you can either browse through the days or press FØ to display a calendar of the current month. Any dates containing a diary entry are now highlighted. As usual you can print out any particular diary page you desire.

The calculator is perhaps the only accessory which is slightly disappointing, as it features few powerful functions, merely the standard add, divide, subtract, multiply, a few memory manipulating options and a couple of minor functions. There are two non-standard features to call upon but these don't actually have anything to do with the calculator. These are an Ascii table and a unit converter.

Moving on we come finally to the phone book. This is not a true accessory, rather a sub-section of the address book, as it contains, in alphabetical order, the names and phone numbers of the people whom you entered in the address book itself.

Memory

One of the very best features of Genie is the battery backed Ram in which it stores all the data. No messing about with data discs here! So, it goes without saying that you're going to need to know how much of that precious memory all your entries are consuming and how much space you've got left. Naturally, PMS hasn't omitted this feature from Genie, and calling the status screen will give you the low down on memory consumption.

The documentation accompanying the package is comprehensive, well laid out and actually comprehensible. Full marks to PMS on that score. All the accessories are easy to use, and while they may not be the most powerful collection ever assembled they are all useful. With the battery backed Ram making life even easier, the most impressive thing about Genie is the way it rapidly becomes an integral part of your BBC system. Well designed and well worth a look. ◀

Program Genie
Price £79.35
Supplier PMS, 38 Mount Cameron Drive North, St Leonards, East Kilbride G74 2ES, 03552 32796

QUEST MOUSE

The ultimate in Mouse technology, the Watford Electronics Quest Mouse. This package must be the most powerful Mouse package yet produced for the BBC Micro. Featuring state of the art 32K ROM software the Quest Mouse package is filled with features essential to the budding artist looking for the most powerful drawing program around.

The Quest Mouse is FULLY HARDWARE COMPATIBLE with the AMX MOUSE so that programs such as AMX Pagemaker etc. will work with it. The two parts of the Quest package are available separately so that existing Mouse owners can upgrade to the Watford Quest Paint software and so that worn out mice can be replaced for minimum cost.

The Mouse features high resolution 50 PPI operation. It has a rubber ball for maximum accuracy and has three buttons to allow a massive range of options to be accessed without touching the keyboard.

SPECIAL INTRODUCTORY OFFER

QUEST MOUSE & QUEST PAINT	£59
QUEST MOUSE ONLY	£35
MOUSE MATS	£5
QUEST PAINT SOFTWARE	£34

(Quest Paint supplied complete with Software in a 32K ROM, User Guide and Utility Disc)

(PS. The Watford Quest Mouse is FULLY Compatible with the AMX Mouse, therefore all AMX Software will work perfectly with it)

See review for more details

Watford Electronics

JESSA HOUSE, 250 LOWER HIGH STREET,
WATFORD, ENGLAND Telephone: (0923) 37774;
Telex: 8956095; FAX: 01-950 8989

Premier Software PM

TRIVIA TIME

The All New Trivia Quiz Game For All BBC Micros

This new TRIVIA GAME is not at all trivial. It contains 1000 multi-choice questions on a vast range of subjects. From pop music to television, all are covered.

Once a question has been answered correctly you then get to play the computer at what the Americans call "Tic Tac Toe". (See War-Games). The outcome of which depends on how well you answer the questions.

£50 PRIZE

To the person who scores the most points.

All This For Only £11.95 + 50p P&P

Sony 3.5 inch DSDD disks only £1.35 + 50p Postage and Packing

**47 Alderford Street,
Sible Hedingham, Halstead, Essex
CO9 3HX**

NEW! GENIE Your wish is my command...

The Genie System only

£69.00 + VAT

(£79.35 inc. VAT plus £1 carriage)

Address Book - Desk Diary — Calculator — Calendar — Phone Book — Notepad.

Instantly — at any time — Magic??? No, just call GENIE!

How often do you interrupt important work on your computer to use a calculator, look up your address book, consult your diary or make a note of something?

Have you ever wished for an invisible helper, just waiting there in the shadows, behind whatever program you are using, ready to appear, as if by magic, whenever needed?

GENIE — YOUR HELPER, HAS ARRIVED!

GENIE is a revolutionary new system which puts all your day-to-day information literally at your fingertips.

A single keystroke will call up GENIE, from WITHIN a wordprocessor, spreadsheet or other application software— no need to save your work—GENIE appears instantly on screen.

When finished, another keystroke makes GENIE vanish, immediately dropping you back to EXACTLY what you were doing, before you called GENIE.

GENIE is a totally self-contained system requiring no access to disk, it is present in your computer from the moment you switch on.

THE SOFTWARE

The GENIE System software—32K of machine code—has an original screen display, using high resolution windows with up to 7 colours on screen, AND 80 column text display. The screen colours are user selectable to give optimum clarity on any monitor.

GENIE provides; a 10 digit calculator with memory, a 100 year calendar, address book, desk diary, notepad and phone book. Information can be accessed by browsing, or by fast search techniques. The notepad is a mini-wordprocessor with word-wrap, and full cursor editing.

GENIE can produce address labels, and pages of the diary notepad can be output to a printer.

In addition to these, stored in GENIE's memory are ASCII tables and lists of commonly used conversion factors eg metric to imperial units.

All the utilities in GENIE are MENU DRIVEN, making full use of cursor and function keys.

THE HARDWARE

GENIE 'lives' on a small circuit board only 3 inches square.

The GENIE System hardware uses a totally new memory paging technique, developed by PMS, which maps 32K of ROM and 64K of RAM into the address space of a single 16K sideways ROM.

The GENIE board is connected to the computer via a single header on 6 inches of ribbon cable. This header plugs into any ROM socket on the main BBC, MASTER or COMPACT board.

NO flying leads—NO soldering—NO modifications.

Permanent Memory Systems
38 MOUNT CAMERON DRIVE
EAST KILBRIDE G74 2ES. SCOTLAND

03552-32796 (24 Hour)

Readers' Survey

This is where you get your chance to have a say in shaping *Popular Computing Weekly*. We need to know what you like about the magazine, what you don't like, and how you want us to continue to serve your interests.

And it's not just us who can benefit from sending in this survey, but you as well.

Firstly, it needn't cost you a penny – just send it off to the Freepost address given here and at the bottom of the next page. Secondly, we've got 250 copies of Superior Software's *Success in Software* booklet – tips on how to write commercial programs – to give away.

You'll notice that our last question asks for one way in which you think *Popular* can be improved. The 250 most sensible and attractive suggestions will get the booklet.

Please fill in all the sections of the questionnaire. Incidentally, if you filled out last year's survey, please don't think we don't need your views again, even if they haven't changed. We do!

The completed form should be sent to PCW Readers' Survey (Inter-Mediates), Freepost, Sawbridgeworth, Herts CM21 9YA, to reach us by Tuesday, July 7. We will publish the results in a future edition of the magazine.

1a Which computer/computers do you own?

Acorn BBC ☐ Please state which model .....
Acorn Electron ☐
Amstrad CPC 464 ☐ 664 ☐ 6128 ☐
Amstrad PCW8256 ☐ 8512 ☐
Amstrad PC1512 ☐ Model .....
Atari XL/XE ☐ Model .....
Atari ST ☐
Commodore C16 ☐ Plus/4 ☐
Commodore 64 ☐ 128 ☐ 128D ☐
Commodore Amiga ☐
IBM PC or compatible (not Amstrad PC, see above) ☐ Model .....
MSX ☐ Model .....
Sinclair QL ☐
Sinclair Spectrum ☐ Model .....
Other (please specify) .....

.....

1b If you have more than one computer, which one do you currently use most?

.....

2 How long have you owned your current computer (your 'main use' computer if you have more than one)?

Less than six months ☐
Six months to one year ☐
One to two years ☐
More than two years ☐

3 How much time do you spend at your computer each week?

Less than two hours ☐
Two to 10 hours ☐
10–20 hours ☐
More than 20 hours ☐

4a Do you plan to buy a new computer this year?

Yes ☐ No ☐

4b If yes, please specify which model

.....

5 What peripherals do you own?

Monitor ☐
Floppy disc drive ☐
Hard disc drive ☐
Mouse ☐
Printer ☐
Modem ☐
Grapics tablet ☐

Other (please specify) .....

.....

6 What peripherals do you intend to buy this year?

Monitor ☐
Floppy disc drive ☐
Hard disc drive ☐
Mouse ☐
Printer ☐
Modem ☐
Graphic tablet ☐

Other (please specify) .....

7a What do you use your computer for?

Playing games ☐
Programming ☐
Word processing ☐
Music ☐
Business applications ☐
Communications ☐
Graphics ☐

Other (please specify) .....

.....

7b Which of the uses in 7a (including Other) would you say was the main use of your computer?

.....

8 How much do you spend on software each month?

Up to £10 ☐ £20—£30 ☐
£10—£20 ☐ More than £30 ☐

9a Where do you mainly buy computer software from (tick one only)?

Mail order ☐ Specialist computer shop ☐
High Street chain store ☐

9b How far would you travel to buy a particular computer product?

One to three miles ☐ Three to 10 miles ☐
Over 10 miles ☐

10 Do you program in any of the following languages?

Basic ☐ Pascal ☐
Machine code ☐ Lisp ☐
C ☐ Forth ☐
Logo ☐ Fortran ☐

11 How often, on average, do you buy *Popular Computing Weekly?*

Subscriber ☐ Every other week ☐
Every week ☐ Once a month or less ☐

12 How many other people read your copy of *Popular Computing Weekly?*

None ☐ Three to five others ☐
One to two others ☐ More than five others ☐

13 What is your main reason for buying *Popular Computing Weekly?*

News ☐ Hardware reviews ☐
Games reviews ☐ Program listings ☐
Other software reviews ☐ General interest articles ☐
Advertisements ☐
Other (please specify).....

.....

14 Please rate the following items according to whether you would like to see more, about the same or less coverage.

	More	Same	Less
News	☐	☐	☐
Letters	☐	☐	☐
Competitions	☐	☐	☐
Special Offers	☐	☐	☐
Hardware reviews/features	☐	☐	☐
DIY hardware projects	☐	☐	☐
Other software reviews	☐	☐	☐
Games reviews	☐	☐	☐
Adventures	☐	☐	☐
Industry comment articles	☐	☐	☐
Programming 'tutorial' articles	☐	☐	☐
Program listings	☐	☐	☐
Peek and Poke	☐	☐	☐
Bytes and Pieces	☐	☐	☐
Communications	☐	☐	☐
Music	☐	☐	☐
Computer swap	☐	☐	☐
Machine specific supplements	☐	☐	☐
Interest specific supplements (eg, graphics, music, etc)	☐	☐	☐

15 How interested are you in the following subjects?

	Not at all interested	Somewhat interested	Very interested
Computer books	☐	☐	☐
Computer languages	☐	☐	☐
Computers in business	☐	☐	☐
Desktop publishing	☐	☐	☐
Programming tutorials	☐	☐	☐
New technological developments (eg, transputers)	☐	☐	☐

16 Which other computer magazines do you buy regularly (please specify)?

.....

.....

.....

.....

.....

.....

.....

17 Please give one way in which you think *Popular* could be improved.

.....

.....

.....

.....

.....

Remember, 250 copies of Superior's *Success in Software* booklet will go to the most constructive answers to this question.

Name.....

Age.....

Occupation.....

Address.....

.....

.....

The completed form is to be sent to PCW Readers' Survey (Inter-Mediates), FREEPOST, Sawbridgeworth, Herts CM21 9YA, by Tuesday, July 7.

Spellmaster contains 59,536 separate English words stored in 131,072 bytes in one chip

- Compatible with all BBC models
- Works with INTER-WORD, WORDWISE PLUS and VIEW
- Checks spelling at up to 10,000 words per minute.
- Checks text as it is entered

SPELL-MASTER ROM

This is the first completely ROM based spelling checker in the world. As a result it out-performs all known spelling checkers on this machine or any other micro-computer. The single 128K EPROM contains over 59,000 separate words and 22K of program.

Compatible with all BBC Micros

Special switching techniques ensure that the 128K ROM appears to the machine as one single 16K ROM - this guarantees that it is completely compatible with the ROM sockets in all versions of the BBC Micro- computer.

Compatible with all the major word processors

SPELL-MASTER has been designed to fully integrate with the most popular word processors on the BBC, WORDWISE and WORDWISE PLUS, VIEW and of course INTER-WORD. While editing in these word processors all that is necessary to control SPELL-MASTER is to press one CTRL key (Usually CTRL-J). This causes a menu to appear listing a variety of options such as 'Check entire text', 'Check word at cursor', 'Continuous check - on/off' etc. Text is checked directly in memory while in the word processor. There are even short-cuts to the menu, for example, pressing CTRL-V in any of the above word processors will start checking the text immediately from the current cursor position. Compare this with the process of checking text in the most highly rated competitive product - VIEWSPELL.

VIEWSPELL	SPELL-MASTER
•Save text from word processor. •Enter spelling checker. •Load text into spelling checker. •Check the text. •Go back to word processor. •Load marked text. •...finally, make corrections.	•Press CTRL-V • make corrections.

Check entire text

In a word processor, SPELL-MASTER can check at up to 10,000 words per minute. Whenever a word is indicated as misspelt the user is given three simple choices. Replace the word with another selected from the dictionary, ignore the word altogether or add it to a user dictionary.

Check as you type

Because the dictionary is ROM based it is possible to check words as they are typed. This feature works with all the above named word processors and does not slow the operation of the word processor at all. Whenever an incorrect word is entered the computer will bleep; the word may then be corrected or simply ignored.

User Dictionaries

SPELL-MASTER supports extensions to the main dictionary in sideways RAM or ROM. This has the advantage that there is no speed degradation when checking against user dictionaries, since there are no disc accesses required at all. Once a word is added to a user dictionary it is treated as if it is present in the main dictionary.

SPELL-MASTER can support a number of separate dictionaries at once, each sideways RAM or ROM holding up to 3000 additional words. Once a dictionary has been created it can be 'burned' into an EPROM to form a permanent extension to the main dictionary.

Provision is made for editing any dictionary extension, for adding or deleting words in bulk, and directly loading or saving user dictionaries from or to sideways RAM.

Additional star commands

These can be issued from any language ROM such as spreadsheets or BASIC (they can even be included into BASIC programs). Some of the 8 commands are:

`*CROSSWORD` - Will search the entire dictionary for words that exactly fit the search pattern. For example *CROSS. ##M#U#ER would list ARMOURER, COMMUTER, COMPUTER. It takes about 8 seconds to check against all 59,000 words.

`*ANAGRAM` - Will list all the words in the dictionary that contain the same letters as those specified.

`*FUZZY` - Will list all words that sound something like the one you are searching for. If you are not sure of the spelling of a word then entering the approximate spelling here will generally list the word you are looking for.

Price: £59.00 incl.

Upgrades

Owners of the older two chip versions of SPELL-MASTER can upgrade to the single chip version for £25.00. However this new version is functionally equivalent and so it should not be necessary to upgrade.

2nd processors

Due to its unique design SPELL-MASTER will not work with word processors running on the 6502 2nd processor, although there are facilities provided for checking long text files.

VISA

Computer Concepts

Access

Gaddesden Place, Hemel Hempstead, Herts HP2 6EX Telephone: (0442) 63933

MUSIC NON-STOP

Hybrid's *Music 500* is a well-established music add-on for the BBC B which competes directly – but using a completely different approach – with Yamaha's CX5 MSX Music Computer. Recently the 500 received a major update and the new system – dubbed Music 5000 (£161 or £69 as an upgrade) – boasts many additional features and improved sound quality, thanks largely to software rather than hardware changes.

The new software has also made it possible for the system to respond to a conventional music keyboard, and this has been launched as the **Music 4000** (£169 with software).

Confused yet? There's no need to be, because the Hybrid system is now more comprehensive and yet more straightforward than it's ever been. The system includes a hardware element which contains the 16 voice channels (although the sounds themselves are generated in software) and until now the only way to create music was to use the programming language AMPLE.

The main command in the AMPLE vocabulary is MAKE. If you type in a series of notes together with the sound name you require, the correct octave and so on, and then type MAKE, the computer remembers all these details under a single name – perhaps INTRO. Then you simply have to enter INTRO any time you want this piece of music to occur.

In the Music 500 system there were no preset sound parameters, and in Music 5000 there's nothing but preset sound parameters. This isn't the disadvantage it sounds – instead of having to treat Music 5000 as a synthesizer with a lot of continuously variable controls, you're given a limited but comprehensive list of various options for envelope shape, pitch envelope and so on, and the combination of these creates a new sound.

The sound quality is similar to that from a good Casio home keyboard, with the additional ability to stack, detune and otherwise alter sounds for much more powerful effects.

The 5000 software has various control options, including a Mixing desk, a Recorder, a Music Stave, and so on. You can type notes onto the screen and see them notated in AMPLE, alter the stereo pan, volume and tone of eight voices while playing back live, and record a performance in real time. This last option has been added to work with the Music 4000 keyboard.

The keyboard is similar to the Symphony released a few years ago, and probably has the same Italian parentage. In fact, it's possible to upgrade a Symphony to use it with the Music 5000 for £47.

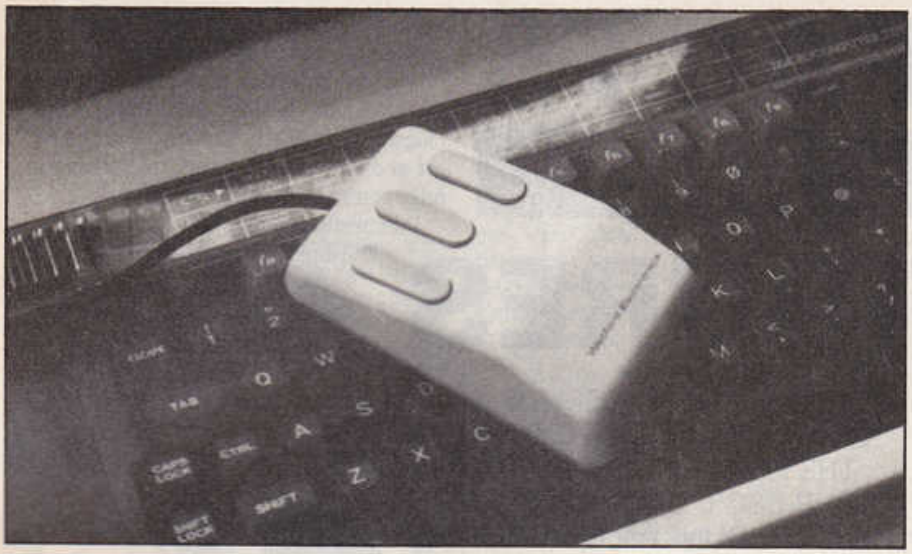
In Split mode each key produces a different sound, repeated in each octave. This is ideal for playing a "kit" of drum sounds while you're programming a piece, and in fact the drum sounds available are surprisingly powerful (you won't be able to link up an external drum machine without some fiddling with the RS432 port so they need to be).

Overall the 5000 system is very flexible, and with the addition of the Music 4000 keyboard it will appeal much more to players as well as programmers. MIDI and better drum synchronisation will be added using the **Music 2000** interface to be shown at the Acorn User show, but Hybrid still prefers to regard its products as comprising a complete stand-alone music system.

Hybrid is also keen to disassociate itself from Peartree's Music 7000, which appears to be a warmed-over Music 500. However, it does offer an early version of AMPLE (on cassette) combined with a modified Mixing Desk page, a Sound Shaper page for creative synthesis which is much more visual than the Music 5000 approach, the ability to print out the music stave (although Music 5000 can do this too, if you have a print ROM), lightpen and mouse compatibility, and so on. You can upgrade a Music 500 (now being given away free with the Master series by some dealers) to a Music 7000 for £39.95, or buy both hardware and software for £79.95, but no deliveries will take place until after the Acorn User show at the end of July. ◀

Hybrid Technololgy, Unit 3, Robert Davies Court, Nuffield Road, Cambridge CB4 1TP, 0223 316910.

Peartree Computers, Peartree House, No. 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF, 0480 50595.



PAINTING BY NUMBERS

WATFORD'S MOUSE SYSTEM LOOKS SET FOR SUCCESS. READ ON FOR A GREAT OFFER . . .

For a long time the AMX mouse system has ruled supreme on the BBC computer, but now there is a new challenger. Watford Electronics has released a combination of mouse and Rom based graphics software for the reasonable price of £59 (ex VAT).

What you actually get for your money is a well built, three button mouse (far superior to the AMX mouse), 32k Rom, 62 page manual and a utilities disc.

After installing the Rom, *Paint calls it up and you're ready to go. On the mouse, the left button executes the current option, the middle runs through four utilities, and the right accesses the menus.

There are two menus available, one at the top of the screen, the other at the bottom. The top menu is the command menu and contains options for pencil, brush, airbrush, replace, fill, cut, line, triangle, rectangle, polygon, ellipse, cut and paste, text, trace, clear screen, undo, input-output, a few special effects options, and a utilities sub-menu.

Many of these facilities are bog standard implementations, but it is worth noting that when using the pencil the drawing action is smooth and responsive. You can vary the thickness of the pencil from one pixel to four pixels wide for really thick drawing. The magnification factor can in fact be applied to most of the other options.

Designing brushes is not explained in the brush section of the manual, but under the pallette section. It's complex stuff, so careful reading is required. You start off with a square brush 16 by 16 pixels, so if you want a circular one you have to load it off the utilities disc, which also contains patterns for fills.

The airbrush is quite nice. Although based on a square shape, the dots appear in the middle and radiate out in a circular fashion. You can change this if you like. One thing missing here, though, is the option to alter the rate of spray from the can. It is noticeable when on maximum magnification, that the speed of spraying slows down by a fair amount.

The cut and paste options are quite interesting and can be used to create some very clever patterns. Among the options are the silhouette which can be used to give objects shadows, the reflect which causes the cutout to be rotated about the y axis, a scaling after cut option, and the ability to rotate the image. The image can be rotated to 90, 180, or 270 degrees but not any angles in between. Also missing is the ability to distort an image by rescaling only one side of the square. If you want to change the size of the image by a fixed factor there are options which make sure that you end up with a quarter size image, not 0.289 or some such oddity.

The text options are used for placing text on the screen in any of four fonts. One is the standard set, one is double sized, and the other two are italicized versions thereof. The facilities offered on text styles are not very comprehensive, so there is the additional option of loading up user defined fonts.

You can lock the size of text being used so that it doesn't get squashed when you're fitting it into a specified area, and you can also have it printed vertically for labelling graphs and the like.

The features that pull this paint package out of the average category are the utilities in the command menu and the options on the pallette menu. These include setting colours as transparent, protecting specific colours from being overwritten, setting up a cycle of colours, lock a pattern on the screen or have drawn exactly at the cursor position.

Besides the four start up colours, the program uses mode 1, which can be changed, there are four shaded colours to select from as well.

One final point to mention, apart from the fact that there is still more to the program than I have been able to fit in, is that the Watford video digitiser is supported and digitised images can easily be imported.

Overall, the combination of a quality mouse and decent art package gives Watford Electronics a real chance of supplanting AMX as mouse supremos. ◀

Program Quest Mouse/Paint
Price £67.85
Supplier Watford Electronics, Jessa House, 250 Lower High Street, Watford WD1 2AN

£10 OFF POP COMP MOUSE OFFER!

Now *Popular* readers can obtain the Watford mouse and paint package at just £57.85, £10 less than the r.r.p. Fill in and cut out this coupon – originals only, no copies – and send it with your cheque or PO to *"Pop Comp Mouse Offer"*, at Watford Electronics, address above.

NAME:.....

ADDRESS:.....

.....

..... POSTCODE.....

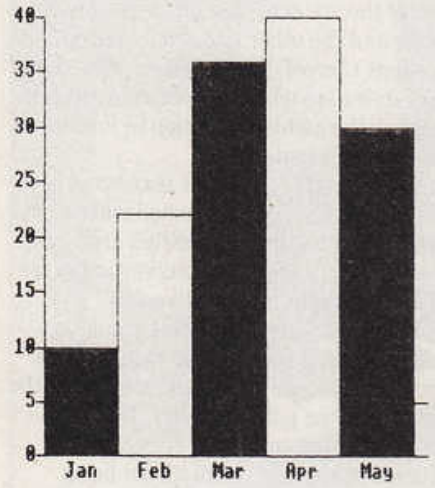
PLEASE ALLOW 28 DAYS FOR DELIVERY

FACTS AND FIGURES

SPELLING CHECKERS AND GRAPH PLOTTERS ADD THE FINAL POLISH TO YOUR BBC'S DOCUMENT OUTPUT. DUNCAN EVANS ASSESSES TWO SUCH OFFERINGS FROM COMPUTER CONCEPTS; SPELL MASTER AND INTER-CHART

Nobody's spelling is perfect. Even Christina Erskine makes mistakes sometimes. If your favourite word processor doesn't have a built in spelling checker, then your only recourse previously would have been to a dictionary, or a disc-based spelling checker. Not any more though.

Spell Master, by Computer Concepts, is a Rom based spelling checker which is directly compatible with **Wordwise** (and **WW+**), **Inter-Word** and **View.** By that I mean that Spell Master can co-reside with any of those programs, and be called upon to check the text being prepared in any of them.



On the facts and figures front Spell Master comes on a 128k Rom which the BBC views as 16k, it has a dictionary of approximately 58,000 words and checks text at around 10,000 words per minute.

Spelling

When in the middle of a document, nothing could be easier if you want to check out a spelling. Simply press Control J and a small window appears offering to check entire text, check marked section, browse, check from cursor or turn immediate check on. Once the checker is called into operation then the computer queries what it thinks are dodgy words and offers to ignore, add word to dictionary or correct word. Assuming you want to correct the word you are offered a list of probable replacements and the chance to enter your own spelling if needs be.

The point about adding words to the dictionary is that you really need to build them up and then have them stored on an Eprom to make efficient use of Spell Master.

Should you not have any of the aforementioned word processors, then you can utilise Spell Master's secondary method of operation which is to read a file off the disc into a text editor. Once you have the text loaded you can check for mistakes as usual but also use rudimentary word processing features, similar to those on Wordwise in fact, to tidy up the text again.

A couple of extra commands worth noting are *Anagram "text", which searches a string for recognisable words, *Browse "word", which allows the browsing through of the dictionary from other software such as Basic, *Check "text" for displaying similar words, and *Crossword which helps find missing letters in unknown words.

If you undertake any substantial measure of writing, and spelling is not your strong point then Spell Master can be recommended to help you on your way.

Inter-Chart is another in the Computer Concepts range of applications Roms, and deals with turning turgid data into easily digestible graphical displays.

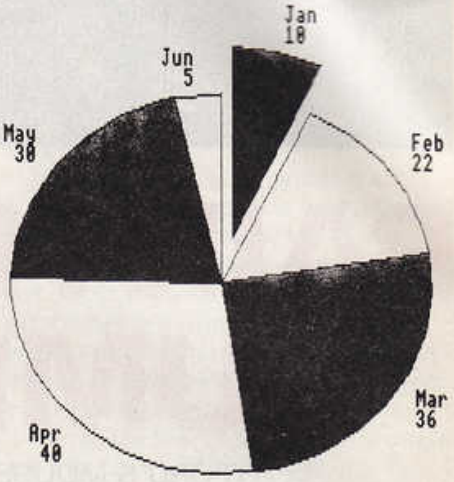
The package itself consists of a sturdy box containing a 16k Rom, instruction manual, function key strip and a reference card.

The data used can be entered directly at the keyboard, loaded from a file or ported across from a Rom-Link package such as **Inter-Sheet.** When used for the first time you would probably go for Option 5 on the menu, which selects a new set of data. Up to sixteen data sets can be used.

After deciding on a name for the data set, you must decide whether to have a label type graph or a scaled graph. Data for scaled graphs consists of entering x,y values whereas a labelled graph uses a value and a corresponding label. Whichever is chosen you are sent to edit mode where the data is entered and, somewhat confusing drawn and redrawn.

You can now have the graph replotted in either a bar graph, line graph or pie chart format. If you have more than one set of data to be displayed, then you can have comparative graphs.

One useful function, especially when using a pie chart, is that of highlighting one piece of data. In the pie chart display that piece of the pie is cut out. Also you can also have the sections labelled with



percentages rather than simply numbers.

Headings are catered for by letting the user specify the text, then place it anywhere on the screen. As well as the standard colours according to the mode in which you are working, there are also shaded colours to help differentiate between units of data.

Should the chart produced still not look right, you can change a number of options relating to how the x and y axis are scaled. And just in case those dots on a graph are not noticeable, you can implement a feature whereby each point is marked by a visible cross. Alternatively you could opt not to have the points connected up.

Printer

Once a graph is suitably displayed, labelled and coloured to your satisfaction you can save it or print it out if you have an Epson compatible printer.

While Inter-Chart is not the most powerful data to graphics program, it is suitable for non professional use of any description, wherever anyone wants to make data look less like gobbledegook and more like something readable. ◀

Products Spell Master, Inter-Chart
Price £59, £36.80
Supplier Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts HP2 4BR, 0442-63933

Popular Election

Duncan Evans

Following on from the soaraway success of the Popular Superbowl listing, Duncan Evans (that's me) suffered another all-night programming session to produce a board game to play as your real hopes crumble.

The listing will be spread over lots of weeks so start typing now. First up, most of the rules on how to play.

Three players take part, either computer or human, and must spend six weeks on the campaign trail round the board. At the end of every week the opinion poll is updated and at the end of the campaign an election night special is featured.

Although most of the options on the boards are explained in the centre panel you must take care not to spend your campaign money too early. After going round the board you receive 15k from Central Office; there are other opportunities to gain more money.

One of the first things that you are asked is for campaign manifesto. Press a number corresponding to the following policies in each department.

Education –

1/ Massive investment in staffing, training and equipment.

2/ Large staffing increases, moderate investment.

3/ Moderate scale all round investment.

4/ Minimal staff support, no new investment.

5/ Snip. Slash spending on education.

Economy –

1/ Reflotation of economy. Vast amounts of money poured in.

2/ Moderate and careful investment.

3/ Stringent control of money supply.

More stuff next week including defence policy and health.

```
5 LET ppoint = 1160
10 LET dicey=1750: LET get=1900: GO SU
B 9000
 15 DIM g(3)
 20 RANDOMIZE 0: LET poll=2000
 50 BORDER 0: PAPER 0: CLS
 55 DIM e(3): DIM c(3): DIM d(3): DIM h
(3)
 60 DIM b(3): DIM u(5): DIM n(3): DIM f
(4): DIM l(5): DIM m(3): DIM p(3)
 65 FOR f=1 TO 3: LET m(f)=50: LET p(f)
=50: NEXT f
 70 LET panel=9200
 90 LET party=1: GO SUB panel
 100 FOR x=1 TO 16: GO SUB 8000+(10*x):
NEXT x
 109 REM Tory selection
 110 PAPER 7: INK 0: PRINT AT 10,6;"Is T
ory under";AT 11,6;"human control";AT 13
,6;"   (Y/N)"
 120 LET a$=INKEY$: IF a$<>"y" AND a$<>"
n" THEN  GO TO 120
 130 LET g(1)=0
 140 IF a$="y" THEN  LET g(1)=1
 150 IF g(1)=0 THEN  GO SUB 270: GO TO 3
00
 154 GO SUB 160: GO TO 300
 155 REM Policy choices are subroutine u
sed by all parties
 160 GO SUB panel: PRINT AT 8,6; FLASH 1
;" Press the ";AT 9,6;" Number For
";AT 10,6;"These Policies"
 170 PRINT AT 12,6;"Education :";: GO SU
B get: PRINT a
 180 PAUSE 20: LET e(party)=a
 190 PRINT AT 13,6;"Economy :";: GO SUB
get: IF a>3 THEN  GO TO 190
 200 PRINT a: LET c(party)=a: PAUSE 20
 210 PRINT AT 14,6;"Defense :";: GO SUB
get: IF a>4 THEN  GO TO 210
 220 PRINT a: LET d(party)=a: PAUSE 20
 230 PRINT AT 15,6;"Health :";: GO SUB g
et: PRINT a
 240 LET h(party)=a
 250 RETURN
 269 REM Computer choices
 270 LET e(party)=INT (RND*3+1): LET c(p
arty)=INT (RND*5+1)
 280 LET d(party)=INT (RND*4+1): LET h(p
arty)=INT (RND*5+1)
 290 RETURN
 299 REM Labour selection
 300 LET party=2: GO SUB panel: PRINT AT
 10,6;"Is Labour";AT 11,6;"under human";
AT 12,6;"control ?";AT 13,6;"   (Y/N)"
 310 LET a$=INKEY$: IF a$<>"y" AND a$<>"
n" THEN  GO TO 310
 320 LET g(2)=0: IF a$="y" THEN  LET g(2
)=1
 330 IF g(2)=0 THEN  GO SUB 270
 340 IF g(2)=1 THEN  GO SUB 160
 399 REM Alliance selection
 400 LET party=3: GO SUB panel: PRINT AT
 10,6;"Are Alliance";AT 11,6;"under huma
n";AT 12,6;"control ?";AT 13,6;"   (Y/N)
"
 410 LET a$=INKEY$: IF a$<>"y" AND a$<>"
n" THEN  GO TO 410
 420 LET g(3)=0: IF a$="y" THEN  LET g(3
)=1
 430 IF g(3)=0 THEN  GO SUB 270
 440 IF g(3)=1 THEN  GO SUB 160
 499 REM Decide country's desires
 500 LET flag=0: RESTORE 1800+INT (RND*5
+1)
 510 READ a: FOR f=1 TO 5: IF u(f)=a THE
N  LET flag=1
 520 NEXT f: IF flag=1 THEN  GO TO 500
 525 LET f=1
 530 IF u(f)=0 THEN  LET u(f)=a: GO TO 5
50
 540 LET f=f+1: IF f<5 THEN  GO TO 530
 550 IF f<5 THEN  GO TO 500
 600 LET flag=0: RESTORE 1810+INT (RND*3
+1)
 610 READ a: FOR f=1 TO 3: IF u(f)=a THE
N  LET flag=1
 620 NEXT f: IF flag=1 THEN  GO TO 600
 625 LET f=1
 630 IF u(f)=0 THEN  LET u(f)=a: GO TO 6
50
 640 LET f=f+1: IF f<3 THEN  GO TO 630
 650 IF f<3 THEN  GO TO 600
 700 LET flag=0: RESTORE 1820+INT (RND*4
+1)
 710 READ a: FOR f=1 TO 4: IF u(f)=a THE
N  LET flag=1
 720 NEXT f: IF flag=1 THEN  GO TO 700
 725 LET f=1
 730 IF u(f)=0 THEN  LET u(f)=a: GO TO 7
50
 740 LET f=f+1: IF f<4 THEN  GO TO 730
 750 IF f<4 THEN  GO TO 700
 800 LET flag=0: RESTORE 1830+INT (RND*5
+1)
 810 READ a: FOR f=1 TO 5: IF u(f)=a THE
N  LET flag=1
 820 NEXT f: IF flag=1 THEN  GO TO 800
 825 LET f=1
 830 IF u(f)=0 THEN  LET u(f)=a: GO TO 8
50
 840 LET f=f+1: IF f<5 THEN  GO TO 830
 850 IF f<5 THEN  GO TO 800
 900 GO SUB poll: FOR f=1 TO 3: LET b(f)
=1: NEXT f
 999 REM Here we go. 4hrs left to write
the main routine.
1000 LET week=0
1050 FOR z=1 TO 2
1100 LET party=1: GO SUB panel: GO SUB d
icey
1110 PRINT AT 10,7;"You rolled ";dice
1120 GO SUB 8000+(b(party)*10)
1130 LET b(party)=b(party)+dice: IF b(pa
rty)>16 THEN  LET b(party)=1
```

Font Designer

Steve Turner

This font designer, presented over two weeks, can be used to change the text or create user defined characters for a SuperBasic channel.

If you require a user defined font, load it into memory and use the following to activate it.

Char channel, font address.

Note that the data must be in two parts using the standard format, starting 900 bytes from the start of the first.

First install the new SuperBasic command by typing in listing 1. Save the code with *SBytes mdvi_Char_Dat,c,190*. Once done, try installing the extension with *Call c*. If all is well the extension can be used in your own programs with code like –

100 c=Respr(190):Lbytes mdvi_char_dat,c:Call c

The font designer will install the extension itself when run.

The instructions relating to listing 2 appear next week.

LISTING_1

```
100 c=respr(190)
110 for a=c to c+189 step 16
120 CHECK=0:READ A$,CH
130 FOR B=1 TO LEN(A$)-1 STEP 2
140 N=DEC(A$(B))*16+DEC(A$(B+1))
150 POKE A+(B-1)/2,N
160 CHECK=CHECK+N:NEXT B
170 IF CHECK=CH THEN
180 NEXT A
190 ELSE
200 PRINT #0;"CHECKSUM ERROR AT LINE"!(A-C)/1.6+280
210 STOP
220 END IF
230 DEFINE FUNCTION DEC(H$)
240 IF H$<"A" THEN RETURN H$:ELSE RETURN CODE(H$)-55
250 END DEFINE
260 :
270 :
280 DATA "3478011043FA000084E9270004E750001",1046
290 DATA "000E044348415200000000000000007C01",429
300 DATA "2F2E0058BBCB6700008A08360007B801",1066
310 DATA "671A2F0D2A4B504D2F0D347801124E92",938
320 DATA "265F2A5F4A80666C3C369800CCFC0028",1444
330 DATA "DCAE0030BCAE00346254207668002008",1332
340 DATA "0C80FFFFFFFF6746BBCB674634780118",2093
350 DATA "4E924A80663E5343663822769800 2D5F",1342
360 DATA "00582449B5FC000000000671AD5FC0000",1224
370 DATA "038412BC001F137C0060000114BC007F",947
380 DATA "157C0040000176FF70254E434E7570FA",1434
390 DATA "600270F12D5F00584E7500000000",874
```

LISTING_2

```
100 REMark ********************************************
110 REMark * QL FONT DESIGNER BY STEVE TURNER 1986  *
120 REMark ********************************************
130 REMark * ERROR DETECTION *
140 WHEN ERRor
150 FOR bell=12,6,9
160 BEEP 2000,bell:PAUSE 5
170 END FOR bell
180 basic=PEEK_L(163856)
190 line_=PEEK_W(basic+250)
200 errnum=PEEK_L(basic+298)
210 CLS#2:PRINT #2;line_;' ';'ERROR ';'TYPE ';errnum;' ';
220 SELect ON errnum
230 =-1 TO -6,-10,-17,-18,-19,-21
240  PRINT #2,'SOMEHOW ';'YOU ';'HAVE ';'MANAGED ';'TO ';'CRASH ';'THIS ';'PROG. ';'TH
IS ';'IS ';'A ';'FATAL ';'ERROR ';:C_ON:NEW
250 =-7,-8,-9,-12,-13,-15,-16,-20
260  PRINT #2,'DEVICE ';'READ ';'PROBLEM ';'ENSURE ';'CORRECT ';'MEDIUM ';'IN ';'DEFA
ULT ';'DRIVE ';:C_ON:POKE_W(basic+250),line_:RETRY
270 =-11
280 PRINT #2,'DRIVE ';'FULL ';'REPLASE ';'TAPE ';:C_ON:POKE_W(basic+250),line_:RETR
Y
290 =-14
300 PRINT #2,'FORMAT ';'FAILED ';'REPLACE ';'TAPE ';:C_ON:POKE_W(basic+250),line_:R
ETRY
310 END SELect
320 END WHEN
330 REMark * MAIN PROGRAM
340 REMark * LOAD BASIC EXTENSION
350 x=RESPR(190):LBYTES mdv1_char_dat,x:CALL x
360 REMark * SET UP WINDOWS
370 MODE 4:OPEN #3,scr_512x256a0x0:PAPER #3,4:CLS#3
380 WINDOW #3,68,76,40,20:PAPER #3,7:CLS#3
390 WINDOW #6,76,30,10:colour 1:CLS
400 WINDOW #3,380,76,120,20:PAPER #3,7:CLS#3
410 WINDOW #2,380,76,110,10:colour 2:CLS#2
420 WINDOW #3,450,135,40,110:PAPER #3,7:CLS#3
430 WINDOW #3,450,135,30,100:colour 3:CLS #3
440 WINDOW #0,470,48,20,256-48
450 AT #0,3,12:PRINT #0;'  **  FONT DESIGNER STEVE TURNER 1987  **
460 cond=0:grid
470 REMark * MAKE SPACE FOR A FONT & LOAD ANY EXISTING
480 char_start=RESPR(2000):OLD
490 REMark * MAKE #3 USE NEW FONT
500 chan #3,char_start
510 REMark * MAKE A DEFAULT CHARACTER
520 FOR x=char_start+2 TO char_start+190:POKE x,x-char_start:POKE x+900,x-char_
start
530 REMark * LOOP ROUND EACH TASK AND RE-SHOW MENU
540 REPeat forever
550 menu:grid
560 in=CODE(INKEY$(-1))
570 SELect ON in
580 REMark * SAVE A FONT
590 =49:CLS#2:INPUT #2;\\,'Enter Device_Filename ';dev$
600 CLS#2:INPUT #2;\\,'Delete First ? (Y/N) ';a$
610 CLS#2:IF a$=='y' THEN DELETE dev$
620 SBYTES dev$,char_start,2000
630 REMark * DRAW OUT A CHARACTER
640 =50:CLS#2
650 INPUT #2;\\,'Enter Code of Required Character ';ode:CLS#2:IF ode<32 OR ode
>191 THEN PRINT #2;\\,'Non Valid Character - Press A Key.':PAUSE:CLS#2:GO TO
650 :ELSE PRINT #2;\\,'PLEASE WAIT.'
660 REMark * DRAW ANY EXISTING CHAR. INTO GRID
670 FOR x=0 TO 8
680 xpos=0:ypos=x*8:temp=VAL
690 FOR y=0 TO 7:xpos=y*8:IF (temp&&(2^(7-y)))>0 THEN box
700 END FOR x
710 p_chars:CLS#2:PRINT #2;\,'Use Cursor Keys <=>7 to Position Pixel \\,'Space
 to Mark - & - "F5" to Clear'\\,'Enter to Stop Editing Character  :ode
720 REMark * LOOP ROUND DRAWING CURSOR UNTILL 'ENTER' PRESSED
730 xpos=0:ypos=0:cond=0:REPeat inp
740 box
750 in1=CODE(INKEY$)
760 SELect ON in1
770 =192:IF cond THEN box
780 xpos=xpos-8*(xpos>0)
790 =200:IF cond THEN box
800 xpos=xpos+8*(xpos<40)
810 =208:IF cond THEN box
820 ypos=ypos-8*(ypos>0)
830 =216:IF cond THEN box
840 ypos=ypos+8*(ypos<64)
850 =32
860 IF (VAL &&(2^(7-(xpos/8))))>0 THEN GO TO 850:ELSE IF cond THEN box
870 box:cond=cond^255
880 TEMP1=VAL(PEEK(cpos+(ypos/8)),(PEEK(cpos+(ypos/8))+temp)
890 STRIP#3,2:p_char cde:STRIP #3,0:p_last
900 =248
910 IF (VAL &&(2^(7-(xpos/8))))=0 THEN GO TO 850:ELSE IF cond THEN box
920 box:cond=cond^255:TEMP1=VAL(PEEK(cpos+(ypos/8)),(PEEK(cpos+(ypos/8))-tem
p)
930 STRIP#3,2:p_char cde:STRIP#3,0:p_last
940 =10:EXIT inp
950 END SELect :in1=0
960 END REPeat inp
970 END SELect
980 END REPeat forever
990 :
1000 :
1010 REMark * WAIT FOR ERROR MESSAGE TO BE READ
1020 DEFine PROCedure C_ON
1030 PRINT #2;'PRESS ENTER TO CONTINUE...':PAUSE:CLS#2
1040 END DEFine
1050 :
1060 :
1070 REMark * PRINT MENU
1080 DEFine PROCedure menu
1090 CLS#2:PRINT #2;\\,'  1 ... Save Font.'\\\,'  2 ... Design Font.'
1100 END DEFine
1110 :
1120 :
1130 REMark * PRINT EACH CHARACTER OF NEW DESIGN
1140 DEFine PROCedure p_chars
1150 FOR x=32 TO 191
1160 IF x=cde THEN STRIP#3,2
1170 p_char x
1180 IF x=cde THEN STRIP#3,0
1190 END FOR x:p_last
1200 END DEFine
1210 :
1220 :
1230 REMark * PRINT EACH SIZE OF NEW CHARACTER
1240 DEFine PROCedure p_last
```

Swing Away

There's no escape! Not content with Popular Election, in this issue we also have the computerised version of the swingometer. Full instructions for this BBC routine are given in the listing.

Peter Story

```
   10CLS:PRINT''"To find the swing from Pinks to Greens"
   20PRINT''"Type the number of candidates last time":INPUT last
   30PRINT''"Enter the votes from last time:"
   40PROCinput(last):lastpercent=percent
   50CLS:PRINT''"Type the number of candidates this time":INPUT this
   60PRINT''"Enter the votes from this time:"
   70PROCinput(this):thispercent=percent
   80PRINT''"The swing is ";lastpercent-thispercent;" from Pinks to Greens"
   90PRINT"Press any key for re-run":G=GET
  100RUN
  110DEF PROCinput(field)
  120total=0
  130PRINT'"Type the initial letter of the party and number of votes leaving no
space"
  140FOR I=1 TO field
  150PRINT"Candidate ";I;:INPUT LINE I$
  160vote=VAL(RIGHT$(I$,(LEN(I$)-1)))
  170total=total+vote
  180IF LEFT$(I$,1)="P" P=vote
  190IF LEFT$(I$,1)="G" G=vote
  200NEXT I
  210percent=(P-G)/total*100
  220ENDPROC
```

Fade

This utility for the BBC computer will enable you to fade the screen display. While it will work in Mode 7 the best results can be obtained from using Mode 2. To activate the fade out enter *Call &AOO*.

Adam Nightingale

```
10FORA%=1TO3STEP2
20P%=&A00
30LOPTA%
40.FADE
50LDX#0
60.LOOP1
70LDA#0:STA&80:LDA#&30:STA&81
80.LOOP2
90LDY#0
100.LOOP3
110LDA(&80),Y:LSR A:STA(&80),Y:INY:BNE
LOOP3
120 INC&81:LDA&81:CMP#&80:BNE LOOP2
130INX:CPX#8:BNE LOOP1
140RTS:]:NEXT
```

Mem Save

This C64 routine allows you to save to tape a specific block of memory. All those unpleasant pokes are already worked out for you, and all you have to do is follow the on screen prompts.

William McCombie

```
READY.


50 PRINT"■":POKE53280,11:POKE53281,11
60 PRINT"    MEMORY SAVE PROGRAM "
70 PRINT"    ──────────────────── "
80 INPUT"  START ADDRESS ";S
90 INPUT"  END   ADDRESS ";E:E=E+1
100 INPUT"  FILE  NAME    ";N$:SYS57812N$,1,1
110 POKE194,INT(S/256):POKE193,S-256*PEEK(194)
120 POKE175,INT(E/256):POKE174,E-256*PEEK(175):PRINT"▨":SYS62957

READY.
```

BYTEBACK

THE ATARI ST SPECIALIST

BEST PRICES *FASTEST* DELIVERY!

GAMES	RRP	ONLY
Gauntlet	24.99	19.50
Star Trek	19.95	15.50
Barbarian	24.95	19.50
Airball	24.95	19.50
MGT	24.95	19.50
Arkanoid	14.95	11.50
Goldrunner	24.95	19.50
Metro Cross	24.95	19.50
Mouse Trap	14.95	11.50
Skyfox	24.95	19.50
Prohibition	19.95	15.50
Turbo GT	15.95	12.50
SDI	45.95	36.50
Balance of Power	29.95	23.50
Arena + Bataccas	34.95	27.50
Eden Blues	24.95	19.50
Trailblazer	24.95	19.50
Macadam Bumper	24.95	19.50
Liberator	12.95	10.00
Timeblast	9.95	7.50
Plutos	14.95	11.50
Xevious	24.95	19.50
Leaderboard	24.95	19.50
10th Frame	24.95	19.50
Mean 18	29.95	23.50
Shanghai	24.95	19.50
Hacker I or II	24.95	19.50
L. Computer People	34.95	27.50
Strip Poker	19.95	15.50
Tee Up	14.95	11.50
Thai Boxing	14.95	11.50
Space Pilot	19.95	15.50
Joust	29.95	23.50
Star Raiders	29.95	23.50
Word for Word	39.95	31.50
Super Huey	19.95	15.50
Arctic Fox	39.95	31.50
Q Ball	19.95	15.50
Champ. Wrestling	24.95	19.50
Rogue	24.95	19.50
Winter Games	24.95	19.50
Super Cycle	24.95	19.50
GFL Champ. Football	24.95	19.50
Basketball (2 on 2)	24.95	19.50
Karate Master	12.95	10.00
Typhoon	19.95	15.50
Hippo Backgammon	39.95	31.50
Colourspace	19.95	15.50
Ninja Mission	9.95	7.50
Techmate Chess	19.95	15.50
Shuttle II	24.95	19.50
Karate Kid II	24.95	19.50
Pinball Factory	24.95	19.50
Cards	19.95	15.50
Electronic Pool	19.95	15.50
Major Motion	19.95	15.50
Time Bandit	29.95	23.50
Lands of Havoc	19.95	15.50
Silent Service	24.95	19.50
Harrier Strike	49.95	39.00
Strike Force Harrier	24.95	19.50
Mercenary	24.95	19.50
Universe 2 ST	69.96	55.50
Mission Mouse (b/w)	19.95	15.00
ST Karate	19.95	15.50
Protector/Space Stn	24.95	19.50
War Zone/Fire Blast	24.95	19.50
3D Chess	24.95	19.50
Deep Space	34.95	27.50
Wanderer 3D	24.95	19.50
Starglider	24.95	19.50
Terrestrial Encounter	14.95	11.50
Flight Sim. II	49.95	39.00

STRATEGY	RRP	ONLY
Phantasie II	24.95	19.50
Temple of Apshai	24.95	19.50
Ultima 2 or 3	24.95	19.50
Road War 2000	24.95	19.50

ADVENTURES	RRP	ONLY
Guild of Thieves	24.95	19.50
Beaurocracy	29.95	23.50
Hollywood Hi-Jinx	29.95	23.50
Moonmist	29.95	23.50
Questprobe	19.95	15.50
Kings Quest II	29.95	23.50
Jewels of Darkness	19.95	15.50
Silicon Dreams	19.95	15.50
Alternate Reality	24.95	19.50
Pawn	24.95	19.50
Trinity	34.95	27.50
Hitch Hikers Guide	29.95	23.50
Tass Times	24.95	19.50
Borrowed Time	24.95	19.50
Mindshadow	24.95	19.50
Leather Goddesses	29.95	23.50
Mind F. Voyaging	34.95	27.50
Zork (I, II or III)	29.95	23.50
Deadline	29.95	23.50
Bally Hoo	29.95	23.50
Enchanter	29.95	23.50
Sorcerer	29.95	23.50
Spellbreaker	29.95	23.50
Transylvania	19.95	15.50
Black Cauldron	29.95	23.50
Winnie the Pooh	24.95	19.50

ART & DESIGN	RRP	ONLY
GFA Draft	99.95	79.50
Art Director	49.95	39.50
Film Director	59.95	47.50
Pro Sprite Generator	39.95	31.50
Degas	39.95	31.50
Degas Elite	79.95	63.50
Art Scribe	24.95	19.50
The Music Studio	34.95	27.50
CAD 3D	49.95	39.50
Easy Draw	149.95	119.50

UTILITIES & BUSINESS	RRP	ONLY
Pro Sound Designer	57.44	49.00
ST Doctor	19.95	15.50
First Word Plus	79.95	63.50
SuperBase Personal	99.95	79.50
Publishing Partner	159.85	127.50
Fleet St. Publisher	115.00	92.00
Ramdisk/Spooler	24.95	19.50
ProCopy ST	34.95	27.50
TRIMbase	89.95	71.50
VIP Pro. GEM	228.85	183.00
Thunder	39.95	31.50
Back Pack	49.00	39.00
Minicomm	29.95	23.50
1st Mail	29.95	23.50
K-Comm 2	49.95	39.50
K-Ram	29.95	23.50
K-Spread 2	79.95	63.50
K-Switch	29.95	23.50
Metacomco Make	49.95	39.50
Payroll	199.00	159.00
MI Print	19.95	15.50
Digidrum	24.95	19.50
Digidrum sample disk	14.95	11.50
Zoomracks 1	39.95	31.50
Zoomracks 2	69.95	55.50
Cornerman	29.95	23.50
Michtron Utilities	39.95	31.50
Megafont ST	29.95	23.50

LANGUAGES	RRP	ONLY
GFA Basic	59.95	47.50
GFA Basic Compiler	59.95	47.50
Fast Basic	89.90	71.50
K-Seka	49.95	39.50
MCC Cambridge Lisp	149.95	119.50
MCC BCPL	99.95	79.50
MCC Pascal	89.95	71.50
MCC Lattice C (3.04)	89.95	71.50
MC Assembler	49.95	39.50
Modula 2 ST	99.95	79.50
Pro Fortran/Pascal	147.95	118.00

Lots of Public Domain Software from only ..... £3.50 per disk!

ALL PRICES INCLUDE VAT AND FIRST CLASS POST
TELEPHONE (0636) 79097 FOR PERSONAL ASSISTANCE
Send Cheque/PO to:

BYTEBACK 20a SPRING GARDENS, NEWARK, NOTTS NG24 4UW

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.

PRICE £15.00 (all inclusive)

NOW AVAILABLE

FIXGEN 86/7 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 1986/7. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner. Yearly updates available.

POOLSWINNER with FIXGEN £16.50 (for both)

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.

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

ALL PROGRAMS AVAILABLE FOR: AMSTRAD CPCs, AMSTRAD PCWs (ADD £3.00), All BBCs, All SPECTRUMS, COMMODORE 64/128, ATARI (48K+), SINCLAIR QL
Supplied on tape (simple conversion to disc) – except PCW (on 3" disc) and QL (on microdrive)

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

VISA phone 24 hrs

selec SOFTWARE

Access phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. ☎ 061-428 7425
(Send for full list of our software)

THE MIRRORSOFT DEVELOPMENT INITIATIVE

Mirrorsoft is establishing a database of experienced software designers, original and conversion programmers, graphic artists, and musicians. This database will be our 'bible' for commissioning future projects on a regular basis, not only for ourselves but also for our associated companies, PSS in the UK and Spectrum Holobyte/Nexa in the U.S.A. Development for the international market is set to expand rapidly, and there may be opportunities for developers to travel.

If you're freelance or running a development company, with a track record in successful commercial software, and you're looking to greater things on both sides of the Atlantic, you should be on our database. There's no commitment on your part – but if we don't know you, we won't know where to send the cheques!

Just call or write to **John Cook, Product Manager**, at the address below, and we'll send you the details.

Mirrorsoft Limited
Athene House, 66–73 Shoe Lane
London EC4P 2AB
Tel: 01-377 4708

with Kenn Garroch

Stumped on Amstrad

J Armfield, of Hindley, Wigan, Lancs, writes:

Q How the 42nd Lancashire Fusiliers does one enter the mnemonics into a computer?

From time to time I have read articles on machine code in various magazines and even have a book on Amstrad m/c language for beginners.

Well, I understand binary, hex, oct, and decimal. I can calculate one to the other without the computer.

I know the parts of a computer, I understand peeks and pokes, and I've read about registers, etc. I can enter machine codes using data statements etc. Then from there on, a full stop.

Typically, an author writes, "from here on the m/c programs will be written down in mnemonics", but they forget that thick heads like myself do not know how to enter them into the computer.

I see LD H,&9C, then as soon as I enter this, and before I can proceed further, the computer returns a syntax error.

What is omitted? I understand that I shall need an assembler eventually but I don't want to lay out good money until I know what I am learning.

A You really shouldn't take the Fusiliers' name in vain when there are better words that can be used.

I'm afraid that you will have to get an assembler if you want to use machine code mnemonics with your Amstrad.

Normally, the Amstrad works in Basic and will only accept Basic commands (PRINT GOTO, etc). Mnemonics are used to represent the numbers that the processor understands as instructions.

An assembler is used to translate them into the correct code numbers, and take care of such things as branches and jumps to labels. The assembler is a separate program that you load into your computer to do this translation. It cannot be done directly from Basic.

If you have a disc drive with your Amstrad then you will undoubtedly have CP/M which includes an 8080 assembler ASM.COM.

This expects files of mnemonics and assembler commands which it then converts into machine code that the Z80 can understand.

The 8080 instructions are included as a subset in the Z80 command set so don't worry about the processor appearing to be different.

To use the assembler, you will need to create the file containing the instruction mnemonics with a wordprocessor, or ED.COM though the latter is a little difficult to use. Once you have the file, from A> type *ASM file* (the file you created is file.ASM). Then when the assembly is finished, type *LOAD file*. This creates a COM file which can be run by typing its name.

A few weeks ago, Peek and Poke referred to DDT which also includes an assembler which, though simple, will give you a taste of the difference it makes to use mnemonics.

If you don't have a disc drive then you are stuck with data statements until you can get an assembler (unless, of course you write one in Basic).

The Hisoft assembler is quite good as it uses all the standard commands and includes an editor.

Sorting out the Amstrad

J Jameson, of Rhosesmor, Mold, Clwyd, writes:

Q I am having trouble with a sort program on my Amstrad. The program is written in Basic and sorts an array of strings.

Some of the strings contain numbers at the beginning. The problem is that the numbers do not appear in order. Is there something wrong with my sort routine or have I gone about the whole business wrongly? An example of the method is

```
10 DIM A$(20)
20 FOR T=1 TO 20
30 A$(T)=STR$(T)+CHR$(T+64)
40 PRINT A$(T)
50 NEXT
60 F=0
70 FOR T=2 TO 20
80 IF A$(T)>n$(T-1) THEN GOSUB
1000;F-1
90 NEXT
100 IF F=1 THEN 60
110 PRINT
120 FOR T=1 TO 20
130 PRINT A$(T)
140 NEXT
150 END
1000 S$=A$(T)
1010 A$(T)=A$(T-1)
1020 A$(T-1)=S$
1030 RETURN
```

A The problem with sorting strings is that the computer compares the Ascii values of the strings. This means that any numbers at the beginning will be sorted for the Ascii values as well. This puts 0 to 9 in the correct order but 10, 11, 12, etc, will be included with the 1s and before the 2s. 21, 22, 23, etc, will come with the 2s and before the 3s. This is because the Ascii value for 0 is 48, "1" is 49 etc. The letters start at 65, 66 etc.

If you have numbers before all the strings in the list then the solution is to include the VAL function in the comparison. This then converts the string as far as it can, into a number which will then be put in the correct order.

In your example program, change line 80 to:

```
80 IF VAL(A$)(T))>VAL(AS(T-1)) THEN
GOSUB 1000:F-1
```

If you have a mixture of characters and numbers at the beginning of each string then things become a little more complicated. The most obvious thing to do is sort the array in two halves, the numbers and then the letters.

The only problem is that alphabetically the numbers come before the letters (see any book index) whereas in a sort, they come after ie ABC123.

This is because, using VAL on a non-numeric character gives 0. The way around this is to display the sort in two halves as well.

The program below may not be the most elegant method but it does the business.

```
10 DIM A$(20)
20 FOR T=1 TO 20 STEP 2
30 A$(T)=STR$(T)
40 NEXT
50 FOR T=2 TO 20 STEP 2
60 A$(T)=CHR$(85-T)
70 NEXT
80 GOSUB 330
90 F=0
100 FOR T=2 TO 20
110 IF VAL(A$(T))<VAL(A$(T-1))
THEN GOSUB 290:F=1
120 NEXT
130 IF F=1 THEN 90
140 GOSUB 330
150 S=1
160 IF ASC(A$(S))>58
THEN S=S+1:GOTO 160
170 F=0
180 FOR T=2 TO S-1
190 IF A$(T)<A$(T-1)
THEN GOSUB 290:F=1
200 NEXT
210 IF F=1 THEN 170
220 FOR T=S TO 20
230 PRINT A$(T);
240 NEXT
250 FOR T=1 TO S-1
260 PRINT A$(T);
270 NEXT
180 END
290 S$=A$(T)
300 A$(T)=A$(T-1)
310 A$(T-1)=S$
320 RETURN
330 FOR T=1 TO 20
340 PRINT A$(T);
350 NEXT
360 PRINT
370 RETURN
```

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 WC2H 7PP.

All-singing, all-dancing Compunet demos

Graham Edkins brings you up-to-date on all the new Compunet demos, programs and services, including how to get on to its programmers' directory, and the best from the Hall of Fame, where your demos could gain an indefinite life.

Compunet has opened a new area on their network especially designed to bring software houses and programmers together. The area is called Show Biz and represents the formalisation and organisation of the 'Online Jobshop' which Compunet has become.

Software houses

Major software houses are now maintaining directories on Compunet, over which they have complete control, to advertise their needs. These software houses also have access to the Closed User Group (CUG) which contains a directory of programmers in categories of coders, graphics, music, teams, game in progress, trainees and non-CBM programmers.

Programmers on Compunet can have an entry into this directory without charge and it can be updated regularly, and holds information such as experience, where to find a sample of work on Compunet, availability to work, home address and telephone number if wanted. Even programmers who don't have subscriptions can have an entry in the directory provided that they know someone on the system who is prepared to send the information via the Email system to the Editor.

If you would like to see the Show Biz area then GOTO 'BIZ'. On the other hand, if you are more interested in looking at and downloading the demos themselves, then the first place to look is 'Demos'.

Ubik, who produces many good demos, has one called *Psychedelic* on Page 223252; this is unusual because it's a preview of a forthcoming demo. It has a great piece of music and a dynamic display of colour blocks which owes more than a little to Jeff Minter's *Psychedelia*. The final version of this demo will have the display under user control.

The NWCUG has two demos which have been uploaded by IS5. The first at 228430 is my favourite: it has several coloured blocks scrolling round one behind the other to form a spiral. Pressing the space bar will cause the tune to change and a scrolling message on a grid scrolling at a different speed to appear along with graphics forming and fading in the top third of the screen. The second demo has coloured hearts dancing on the screen and is on page 235638.

***I am the Law:* no prizes for guessing who this is. Compunet demo by STE86**

Torquemada, who takes a text frame in his directory at 777793 to explain that he isn't Jason who is his brother and his first name is not Steve, has a large selection of mainly mono hi-res graphics. These are well put together and any, if not all, would make a fine addition to a collection of computer art.

The Meanteam also have a sub-directory to themselves inside 'Demos'. The two programs, *Big Jobs* and *Gargantuan*, both consist of music and a scrolling message with letters so large that they fill the screen, demonstrating the technique of addressing the border. This, incidentally, was considered to be impossible by most programmers until Compunet users proved differently.

Moving sprites

Go to 212238 for Spidey's *Epilepsy* program and you will be rewarded with music, bouncing sprites, flashing screens, a picture of a spider and the longest list of 'hellos' that I've seen yet. All of this is under keyboard control.

Marzipan by Goblin and Ian is typical of so many of the demos that one downloads. The border area is put to good use and contains colourful moving sprites showing the name *Marzipan*. It also has music 'borrowed' from Rob Hubbard and a scrolling message. Other current demos following roughly the same pattern include Sanxaclax Demo on page 229614, MFG1's Side-FX at 237422 and the The Highlanders 1 and 2 in their directory at 216001. It is well worth seeing one of these because they are all well written, but you are unlikely to want all three taking up your disc space.

Mega Mover is something a bit different. This demo, written by M Trenz, is uploaded on page 237565. It shows first a small and then a large spaceship viewed from above passing slowly from top to bottom of your screen. This may sound a little tedious, but the detail in the graphics makes it a pleasure to watch even if it is over too quickly.

Hero's Den has another couple of worthy downloads, *Pacer* being an animated runner facing away from the screen on a vertically scrolling tiled floor, and Ceefax Re-mix, which is a jokey simulation of the real thing. Both of these demos are at 230122. If a demo is really outstanding then

Compunet uploads it into the Demo Greats area of the Hall of Fame, giving it an indefinite life.

You can reach this area by selecting 'DEMOH'. I would suggest that it's worth buying a fresh box of discs (and even a disc drive if you don't have one) and downloading every single program in its directories. I have selected a few which are particular favourites of mine but don't be fooled into thinking that only those mentioned are worthy of your time.

MACH81, under the title of Kenetic Design, has uploaded three stunning pieces in his directory at 201569. *Power Windows* is a spoof Amiga Tutankhamun graphic, *Pure Genius* has blocks re-arranging themselves until they form a picture of a well-loved beer, and *Ace Activision* demos many of that company's software products in a style that I could watch many times over.

"These are well put together, and any, if not all, would make a fine addition to a collection of computer art"

Chrome Robot: **demo with music on Compunet by EAD7**

Rainbow Maker by Rob and Mark is a graphic of Jeff Minter accompanied by sheep, llamas and all, surrounded by a rainbow scrolling border. This is on page 204696, while page 206853 has Sir's *Transputer Demo* showing a large animated Newton's cradle. The *Thrust Concert* has the music of the game and the graphics show a complete group of musicians playing it. This very entertaining demo is from Stoat & Tim at 217681.

ARC86 has programmed a demo extolling the virtues of Compunet. It is called the *10 Minute Trap*, probably because it runs for about that time. It is on page 216784. AEW's Sport Aid has a *Run the World* tune and a good graphic of an animated runner. This program was at one time sold to raise money for Sport Aid, both on Compunet and Prestel, with neither taking any commission from the proceeds. Rather than letting it disappear after all of its sales have been made, Compunet have now made it available at no charge on page 218860.

Anagram have uploaded *Hals Creation*, at 226025, which is a music demo accompanied by sprites moving in a way reminiscent of the 'bathing beauties' seen doing formation swimming in old black and white musicals. Mack & Zaz have created a program which they call Cnet Link. It's a little too complex to try to explain here, but I recommend that you download it for yourself from page 235463.

PROGRAMMERS!

The definitive reference guide for all aspiring game programmers FREE when you subscribe to:

POPULAR Computing WEEKLY

★ Will help you write high-quality marketable computer games software.

★ Explains what qualities you need to succeed and the pitfalls to avoid.

★ Extensive advice on writing and marketing the software.

Please enter my annual subscription to *Popular Computing Weekly* at **£25.00 UK, £39.95 Overseas** and send me my FREE copy of "Success in Software"

☐ Please debit my Access/Visa/AmEx card no:

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Expiry date: ..... Signature: .....

☐ I enclose a cheque made payable to: Sunshine Publications Ltd.

Name: .....

Address: .....

.....

Return this form to: PCW Subs, 12–13 Little Newport Street, London WC2H 7PP, UK.

Cheetah converts Mini to CPCs

Mark Jenkins looks at the latest version of Cheetah's Mini Interface for Amstrad CPCs, and answers some readers' queries.

A few months back we reviewed the Cheetah Mini Interface for the Spectrum, and now the company has converted the system to the Amstrad CPC range.

The system includes a Cheetah MK5 Midi keyboard, which we've mentioned many times; it's a five-octave full-sized Midi control keyboard with no sounds of its own which has a pitch bend wheel, stripped-down patch and octave select controls and a bargain price of £55.

To the MK5 you have to add the Mini Interface which plugs into the computer, and the software on tape or disc. The routine here are as similar to those on the Spectrum as possible, and in fact the Spectrum and Amstrad have the same sound chips so the end results will be pretty similar too.

The micro holds 64 sounds in memory and these range from thin, pingy games-type sound effects to quite powerful chordal sounds; the ADSR envelope is fully programmable so you can alter the way the note fades in and out and how the pitch varies during the course of the note; you can play three notes at a time from the MK5 keyboard.

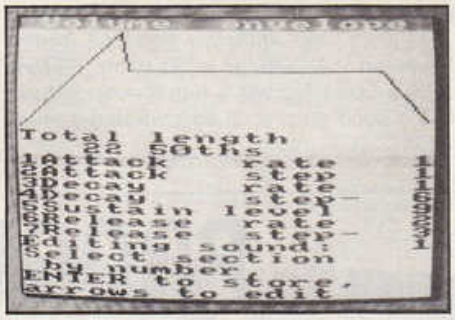
The system is menu-driven, but it doesn't take too long to go from one page to another; you can split the keyboard and edit sounds, saving a new sound or a whole set of sounds to disc.

I can't comment in massive detail on how the Amstrad version of the Cheetah system performed, because mine kept crashing every 30 seconds or so. Maybe I have a bit of a wobbly edge connector on my CPC. However, what I could listen to (in 30 second chunks) was quite promising; if you have a CPC the Cheetah system will take you some way into creating new sounds and recording them on tape, and when you exhaust the potential there, you'll have a very serviceable master keyboard which will allow you to control any Midi synth modules you may go in for.

Now on to a few readers' letters. Herr Frankenfeld has written all the way from West Germany with a question on the Spectrum 128. He has a Yamaha DX7 synth and would like to store sounds from it and edit them on the Spectrum; this is a very popular application for micros because the DX7's sounds are defined by 147 different parameters and there's only Data Entry slider to alter them all.

Herr Frankenfeld wants an interface and editing software for the Spectrum and the only current solution lies with the XRI system, comprising their Micon interface (£49.95) with software (£24.95). However, the company is doing a special offer at the moment which throws in it's *Step Time* sequence editor as well (normally £38.95) for a total price of £75.

Michael Neville of Edinburgh saw our review of *Super Conductor* and wonders if it would operate in conjunction with a Midi keyboard with 13 channels as opposed to 16. I'm sure it would, but I can't think of any keyboard that won't work on channels 14–16, or any keyboard that's 13-note polyphonic, or any keyboard that has thirteen memories. What's meant by a Midi 'Channel' is a setting which allows the synth to respond to one set of information and ignore 15 other sets; most synths only respond to one channel at a time but some can respond to four (like the Casio CZ synths), some to six (like the SCI Max and Six-Trax) and some to eight or more (like the Prophet 2000).



Screen from Cheetah's Amstrad Mini Interface

Whether you use one, two, 13 or all 16 Midi channels with your software depends entirely on whether you have enough synths to take advantage of them. Now perhaps, Michael, you'll write back and tell us exactly what it is that you've got 13 of.

A J Martindale of Milton Keynes has a Yamaha CX5 music computer, an FB-01 module for additional sounds, a Gostex X-15 portastudio and a Yamaha YMC10 convertor to synchronise the computer to tape. He's selling the CX5 and buying an Atari 520ST soon and would like to use the Midi potential of this machine, but would still like to use the YMC10 convertor to link everything to tape.

Step Time input is also important, and on the whole the *EZ-Track* package we mentioned from Hybrid Arts is not best suited for this sort of application. MicroDeal's *Super Conductor* is the best bet here, and costs only £50 or so. The YMC-10 should sync *Super Conductor* to tape quite happily, and the package itself will play the FB-01. If you do get the ST you can choose an editing package from *Soundbits* (Syndromic Music) or *Dr T* (Take Note) to create new FB-01 sounds as well.

Paul Duggan of Caerphilly is a semi-pro musician who wants to be able to type music directly into a micro from a music or Qwerty keyboard. He then wants to be able to save and edit the piece and present it in printed form with lyrics to a group of up to eight musicians.

Paul has a CPC464 at the moment and has tried Firebird's *The Music System*, finding it pretty limited for his applications. He says "I have tried to find out about other systems available but the computer shops don't understand music and the music shops don't understand computers". This, of course, is the secret of the universe, as Paul has obviously discovered.

Paul's thinking about the Atari ST and this seems to be his best bet at the moment. Dr T manufactures a *Score Writer* package (distributed by Take Note) which will cope with very complex note entry and gives massive editing and lyric insertion options; it costs a couple of hundred pounds but the only real alternative is to get Steinberg's Pro-16 and TNS *Note Editor* on the Commodore 64, together with a decent dot matrix printer, and that seems something of a sideways step for an existing Amstrad owner.

Take Note, Unit 7, 43 Carol Street, Camden Town, London NW1 0HT, 01-485 2988.

Cheetah Marketing, Norbury House, Norbury Road, Fairwater, Cardiff CF5 3AS, 0222 555525.

XRI Systems, 10 Sunnybank Road, Wylde Green, Sutton Coldfield, West Midlands B73 5RE, 021 382 6048.

MICRO-FILE

SOFTWARE

STORT SOFT

ATARI MAIL ORDER SPECIALISTS

INCREDIBLE LOW PRICES!

ALL DISKS CARRY A NO QUIBBLE REPLACEMENT GUARANTEE, ARE CERTIFIED 100% ERROR FREE & COME WITH LABELS, 5¼" ALSO HAVE SLEEVES & WRITE PROTECTS.

BLANK 5 1/4" DISKS

DISK NOTCHER FREE WITH EACH 100 DISKS PURCHASED

UNBRANDED	TRIAL 10	25	50	100	10 in a plastic lib. case
SS48 TPI	£4.50	£9.00	£17.00	£33.00	£5.50
DS48 TPI	£5.50	£11.00	£19.00	£35.00	£6.50
DS96 TPI	£6.50	£13.00	£21.00	£37.00	£7.50
DS96 TPI FLIP SIDED	£7.00	£14.00	£22.00	£38.00	£8.00
TRACKER SS48 TPI	£6.00	£13.00	£24.00	£44.00	£7.00
TRACKER DS48 TPI	£7.00	£14.00	£26.00	£46.00	£8.00
TRACKER SS96 TPI	£7.00	£14.00	£26.00	£46.00	£8.00
TRACKER DS96 TPI	£7.50	£15.00	£28.00	£48.00	£8.50
MIMIC FLIP SIDED DS96 TPI	£8.95	£20.00	£38.00	£70.00	£9.95
MIMIC HIGH DENSITY 1.6meg	£23.00	£52.00	£100.00	£180.00	£24.00
COLOURED – mix & match or all one colour					
SS48 TPI	£6.50	£12.00	£22.00	£42.00	£7.50
DS48 TPI	£7.50	£14.00	£24.00	£44.00	£8.50
DS96 TPI	£8.00	£16.00	£28.00	£50.00	£9.00

SPECIAL PRICE!! Dysan DS48TPI BOX OF 10 ONLY £10.95

BLANK 3 1/2" DISKS

	10	25	50	100	10 in a plastic lib. case
MF1DD (SS/DD)	£12.95	£30.00	£58.00	£115.00	£13.95
MF2DD (DS/DD)	£14.95	£35.00	£63.00	£125.00	£14.95

BLANK 3" DISKS

	10	25	50	100
CF2	£25.00	£60.00	£110.00	£200.00
CF2DD	£33.00	£80.00	£150.00	£280.00

LOCKING DISK BOXES

5 1/4" HOLDS 50	£7.95	5 1/4" HOLDS 100	£9.95
3 1/2" HOLDS 40	£7.95	3 1/2" HOLDS 80	£9.95
60/90 HOLDS 60 3" or 90 3 1/2"	£9.95		

COMPUTER ACCESSORIES

5 1/4" DISK NOTCHER (Double your disk capacity on a single sided drive)	£3.95
DISK CLEANING KITS Liquid non-abrasive type – protect your valuable software	
5 1/4" DCK £3.95 3 1/2" DCK	£4.95
ST/IBM/AMSTRAD 1512 TO CENTRONICS PRINTER LEAD (2 metres)	£8.95
ST TO RS232 MODEM LEAD (2 metres)	£8.95
BATTERY POWERED MINI-VAC – for keyboards, printers etc.	£9.95
QUICKSHOT II+ (microswitch) joystick	£8.95

COMPUTER STATIONERY

PRINTER PAPER – Continuous fan fold, sprocket fed.

SHEETS	11"× 9.5" 60gsm	A4 70gsm	11" × 9.5" 90gsm	A4 90gsm
500	£4.95	£6.95	£9.00	£9.95
1000	£8.95	£10.95	£14.00	£15.00
2000	£13.95	£16.50	£24.00	N/A

LABELS – Continuous fan fold, sprocket fed.

	70mm × 36mm	89mm × 36mm	102mm × 36mm	89mm × 49mm
1000	£4.15	£4.25	£4.50	£5.75
2000	£7.50	£7.90	£8.40	£10.50

Please specify number of labels across (1, 2 or 3)

ATARI ST HARDWARE

520STM (½ MEG RAM)	£249.95
520STM+ (1 MEG RAM)	£349.95
520STFM (½ MEG RAM, ½ MEG DRIVE & MOUSE)	£379.95
520STFM+ (1 MEG RAM, ½ MEG DRIVE & MOUSE)	£479.95
1040STF (1 MEG RAM, 1MEG DRIVE & MOUSE)	£559.95
520STFM & SM125 HI-RES MONO MONITOR	£479.95
1040STF & SM125 HI-RES MONO MONITOR	£659.95
• • • STAR VALUE • • •	
520STM, SM125 MONO MONITOR, SF354 ½ MEG DISC DRIVE, MOUSE & 1st Word WORD PROCESSOR	£449.95
520STM, SM125 MONO MONITOR & SF354 ½ MEG DISC DRIVE, MOUSE, 1st Word WORD PROCESSOR & SMM804 DM PRINTER	£599.95
1040STF, SM125 MONO MONITOR & SMM804 DM PRINTER	£819.95
520STFM & ADDITIONAL ½ MEG DRIVE (SF354)	£499.95
520STFM, ADDITIONAL ½ MEG DRIVE (SF354) & SM125 MONITOR	£599.95
520STFM & SC1224 12" MED RES COLOUR MONITOR	£739.95
1040STF & SC1224 12" MED RES COLOUR MONITOR	£899.95

All Hardware comes with free dust covers!!

All STs come with 5 public domain disks including CPM emulator and the arcade game Megaroids, 5 blank disks to get you going. Basic language disk and manuals.

Just write for more information. Cheques etc. payable to STORT SOFT (International orders add 10% and remit in pounds Sterling by bank draft or intl. money order. Write for quote in any other currency.)

ACCESS/MASTERCARD/EUROCARD/VISA accepted. CREDIT CARD ORDER LINE – 0279 89509

NO HIDDEN EXTRAS – WHAT YOU SEE IS WHAT YOU PAY

18 CROWN CLOSE, SHEERING, BISHOP'S STORTFORD, HERTS CM22 7NX

SPECIAL OFFER FOR THE MONTH

CPC 6128 (Colour) £339.95

Price includes VAT. Please add £15 for data post.

Amstrad PC1512 SDMM	£470.00
Amstrad PC1512 DDCM	£740.00
Amstrad PC1512 DDMM + DMP 3000 printer + Supercalc 3 + Wordstar 1512	£699.00
Amstrad PC1512 HD20CM	£1100.00
PCW 8512	£510.00
PCW 8256	£407.00
DMP 2000 (printer)	£152.00
DMP 3000 (printer)	£173.00
FD-1 (disc drive)	£90.00
3" Floppy discs (box of 10)	£25.99
Interface for PCW or CPC	£53.00
Printer Ribbon for DMP 2000	£5.30

AMSTRAD CPC SOFTWARE

Mini Office II (disc)	£14.50
Protext (disc)	£17.85
Tasword 6128 (disc)	£18.35
Masterfile III (disc)	£28.90
Tas-Spell (disc)	£13.45
Mastercalc 128 (disc)	£27.50
Plan It (disc)	£14.50

AMSTRAD PCW SOFTWARE

Supercalc 2	£38.95
Dr Draw/Dr Graph	£34.00
Protext w/p (+6128)	£54.00
Tasword-8000	£18.75
Masterfile-8000	£34.00
Tas-Spell-8000	£12.50
Touch-n-Go	£19.00
Maxam II (Assembler)	£63.50
Popular Accounts (Sagesoft)	£64.90
Tomahawk	£15.35
Trivial Pursuit	£15.35
Fair Light	£11.50
Jewels of Darkness	£15.35
Prospell	£18.00
C Basic Compiler (Arnor)	£56.95

AMSTRAD PC1512 SOFTWARE

Supercalc 3 (ele. spreadsheet)	£55.95
Wordstar (word processor)	£55.95
Reflex (database)	£55.95
IBM Volkswriter, deluxe	£35.99
PC Four (PSion)	£63.50
Sidekick (utility)	£22.95
Touch 'n' Go (tutorial)	£19.00
Trivial Pursuit	£15.35
Volkswriter Deluxe	£35.99

All prices include VAT and delivery in U.K. only.
We specialise in Amstrad hardware and software.
Please ring for details or send an S.A.E. for our catalogue. Customers make cheques payable to:

CHILTERN COMPUTER CENTRE
100 HIGHTOWN ROAD, LUTON, BEDS LU2 0DQ (UK)
TEL: (0582) 400305

(142)

DISCOUNT SOFTWARE

	R.R.P £	S.F.A £
Enduro Racer	9.99	8.99
Hydrofool	8.95	7.95
Void Runner	2.99	2.49
Durrell Big 4	9.95	8.95
Eagles Nest	8.95	7.95
Head over Heels	8.95	7.95
PC COMPATIBLE		
Sage Accountant	172.00	160.00
Superbase	99.95	85.00
Cambase	49.95	44.95
Blythe Craftware	99.95	89.95
Sage PC Planner	113.00	105.00

S.F.A. COMPUTERS
17 Chisholm Ave
Bishopton, Renfrewshire
PA7 5LH (0505 863935)

Access

(257)

CRIBBAGE

The popular pub game six card cribbage is now available for the 48K/128K Spectrum

Features:

FULL PLAYING CARD GRAPHICS
100% MACHINE CODE
TWO LEVELS OF PLAY
AUTOMATIC SCORING

Suitable for both beginners and experts.

Send £5.50 to:

ESEM SOFTWARE
112 Wrington Close, Little Stoke, Bristol BS12 6EJ
Tel: 0454 612811

(260)

ADVERTISING RATES FOR MICRO-FILE

Semi Display £8 per single column centimetre (+VAT)
Lineage 35p per word (+VAT)

CALL SUSANNAH KING on 01-437 4343 FOR SEMI DISPLAY ADVERTISING

ATARI 520 STFM

NOW IN STOCK FOR ONLY £369.95

ST SOFTWARE AT GIVEAWAY PRICES

Guild of Thieves	19.95	ST Karate	14.95
Silicon Dreams	16.95	Pinball Fact	19.95
Alternate Reality	19.99	Karate Kid	19.95
Mouse Traps	11.99	Mouse Trap	11.99
Cut Throat	26.99	Arena	24.95
Arkenoid	11.99	Kings Quest II	24.95
Karate Kid II	19.99	Sky Fox	19.95
McAdam Bumper	19.99	Trivia Challenge	15.95
Championship Football	19.95	Spitfire 40	15.95
SDI	39.99	Rogue	19.95
Road War 2000	19.99	Moonmist	24.95
Pawn	19.95	Tee Up Golf	15.95
Starglider	19.95	2 on 2 Basket	19.95
Prosound Dragnet	47.95	Little Comp People	29.95
Winter Games	19.95	Goldrunner	19.95
World Games	19.95	Xevious	19.95
Tenth Frame	19.95	Arkenoid	11.95
Turbo G.T. Racer	13.95	Metro Cross	19.95
Leaderboard	19.95	Balance of Power	26.99
Music Studio	27.95	Championship Football	19.95
Eden Blues	19.95	Shanghai	19.95
Harrier	19.95	Turbo GT Racer	13.95
Toolkit	24.95	ProSound Designer	41.95
Pro Sprite Designer	29.95		
Space Pilot	16.95	This is just a small sample of our ST	
Mercenary	19.95	software and hardware. Phone for	
Wrestling	19.95	complete list.	

AMIGA A500

★ 68000 Chip with 512K Ram
★ Mouse controller
★ Built in speech
★ Built in 880K 3½" disc drive
★ 4096 colours and stereo sound
★ Please phone for details
★ Also wide range of software available

£539.95 NOW IN STOCK

Also Amstrad CPC, PCW, PC IBM software and hardware available

ATARI 520 STFM

Includes: word processor, graphics programme, picture demos and other utilities.

Cumana 1 meg drive £149.95
Special Offer SM125 12" high res. mono monitor (few only) £109.95

SOUND N VISION

11 Silk St, Leigh, Lancs WN7 1AW.
Phone now for details – Tel: (0942) 673689
Cheques and P/Orders payable to: Sound N Vision P.&P./VAT INCLUDED
Visitors welcome in showroom. Send S.A.E. for price list. (259)

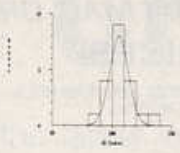
AMSTAT Modular Statistics and Mathematics Package

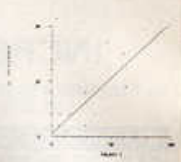
MARKETED BY S. C. COLEMAN

Available for BOTH PCW AND CPC ranges ★★★ New Amstat 7

AMSTAT 1 – means, standard deviations, variance, skew, kurtosis, 1-sample, 2-sample, and paired t-tests, 1-way AOV with single and multiple confidence intervals, 2-way AOV, correlations, regressions, histograms, scattergrams, transformations, file store and retrieve, output to wordprocessor file, manual. Flexible variables and observations to a total of 500 (+) data points.

AMSTAT 2 – 27 nonparametric tests in 4 programs providing a "complete Siegel". Binomial, Chisquare (3), Kolmogorov-Smirnov (2), Runs, McNemar, Sign, Wilcoxon, Walsh, Randomisation (2), Fisher, Median (+extension), Mann-Whitney, Wald-Wolfowitz, Moses, Cochran, Friedman, Kruskal-Wallis, Contingency, Spearman, Kendall, Kendall partial, Concordance.





"tremendous value" – Tony Kendle, Popular Computing Weekly, 8–14th May 1986.

"I now give it an unreserved recommendation . . ." – Jo Stork, Business Computing with the Amstrad, July 1986.

AMSTAT 3: FORECASTING
An 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 print-out, manual suited to immediate use and for teaching.

AMSTAT 4: RESOURCE MANAGEMENT – LINEAR PROGRAMMING MODULE
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.

AMSTAT 6: SFANOVA – Up to 8-way analysis of variance for equal cell sizes. Unequal cell sizes on 1-way AOV. Maximum of 2,000 data points (300 on unexpanded CP/M 2-2). Input for ASCII files. Output to screen or text file with full AOV table + main and interaction means and Newman-Keuls on main effects. Manual (disc only).

AMSTAT 7: RESOURCE MANAGEMENT II – STOCK AND PRODUCTION ANALYSIS
Calculation of optimum re-order levels for both single and multiple items. Dynamic programming to calculate optimum production schedules for single items and consolidation of several results into a multiple schedule. Also Pareto and Lorenz analysis. Output to screen or printer. Includes operational manual with worked examples.

The programs have applications in research of all kinds, education, sales, production planning, work and method study, financial planning, personnel, social work etc.

Price list:	CPC	PCW	Price list:	CPC	PCW
AMSTAT 1	£25.95	£27.95	AMSTAT 6	£25.95	£27.95
AMSTAT 2	£39.95	£39.95	AMSTAT 7	£25.95	£27.95
AMSTAT 3	£25.95	£27.95	AMSTAT 1+2	£49.95	£49.95
AMSTAT 4	£25.95	£27.95	AMSTAT 1+2+3+4	£99.95	£99.95

These prices are exclusive of V.A.T.

All prices include P&P within U.K.
+ 24 hours answerphone
For more details of PC equivalent please enquire.

Cheques and P.O.s to:

S. C. COLEMAN

33 Leicester Road, Ashby-de-la-Zouch, Leics LE6 5DA.
Tel: 0530 415919 (27)

JUMPDISK

THE MONTHLY AMIGA MAGAZINE ON DISK

EVERY ISSUE HAS AT LEAST TEN READY TO RUN PROGRAMMES AND TEN ARTICLES

JUNE ISSUE NOW AVAILABLE

This month's programme highlights include:

EXPLAINMOIRE: AN IN DEPTH GRAPHICS TUTORIAL
PLANET AND JOVIAM: ASTRONOMY DEMONSTRATIONS
EYECATCHER: VECTOR CHASE GAME
SIM: A BRAIN GAME WITH A DIFFERENCE

Amongst all the articles can be found a complete listing of the available public domain disks for the Amiga as well as tips on running them, a tutorial on regis images, help with creating merged icons and the big list of "Bulletin Boards', Stateside.

ALL ARTICLES MAY BE PRINTED, SPOKEN OR READ FROM SCREEN

£8.50 inc. VAT

Please send cheque or money order made payable to:

GEORGE THOMPSON SERVICES LTD,
OLD REIGATE ROAD, BETCHWORTH, SURREY RH3 7DR
TELEPHONE: 073 784 4675

Price includes P.&P. within U.K. & EUROPE

*** BACK ISSUES ***
THESE ARE NOW AVAILABLE. PLEASE CONTACT US FOR DETAILS OF PROGRAMME/ARTICLE HIGHLIGHTS + SPECIAL SUBSCRIPTION
*** STOP PRESS ***
AT THE COMMODORE SHOW IN JUNE WE WILL BE LAUNCHING THE FIRST IN THE "JUMPDISK PRESENTS" SERIES. "EARTYPE" A WORD PROCESSING PROGRAMME WITH FULL SPEECH FACILITY AT £5.00
THE JUNE AND BACK ISSUES WILL ALSO BE ON SALE.

(207)

PLEASE READ THIS

WHOLESALE PRICES TO YOU THE USER

WABASH 5¼"	Quantities			
	25	50	100	200
SS/SD 48 TPI	£11	£20	£38	£69
SS/DD 48 TPI	£11.50	£22	£41	£74
DS/DD 48 TPI	£12	£23	£43	£83
RPS XIDEX ETC				
DS/DD 96 TPI	£13	£24	£45	£85

3½ DS/DD PLAIN LABEL DISCS.

We only sell made in Japan items as they are the best.

10 = £18
20 = £30
50 = £75
100 = £135

Prices inc. VAT and delivery
100% error free certified
Lifetime warranty
Includes labels

LOCKABLE DISK BOXES

5¼" 50 Capacity Ref. YA50L	£9.50	Disc for qty.
5¼" 100 Capacity Ref. YA100L	£11.00	10% for 3+
5¼" 10 Capacity (plastic library case)	£1.00	20% for 6+
3½" 40 Capacity Ref. DS40L	£9.00	25% for 12+

ACCESSORIES

5¼" Head Cleaner and Fluid	£4.00	Disc for qty.
3½" Head Cleaner and Fluid	£6.00	10% for 3+
BBC/Cen printer cable (1m)	£5.00	20% for 6+
IBM/Cen printer cable (2m(	£11.00	25% for 12+

All prices include VAT + delivery

REMEMBER THE PRICES YOU SEE IS ALL YOU PAY

CHEQUE AND POSTAL ORDER TO:

MCS

Manor Court Supplies Ltd

DEPT CW Glen Celyn, Penybont
Llandrindod Wells, Powys
Tel: 0597 87 784

DISCS

CENTRAL MEDIA

3.5 INCH DISCS
DATATECH S/S D/D £14.00
UNBRANDED S/S D/D £12.00
5.25 INCH DISCS
DATATECH D/S D/D 96tpl £8.00
DATATECH D/S D/D 48tpl £8.50
TDK S/S D/D 48tpl £7.50

TRADE ENQUIRES WELCOME

ALL CHEQUES & PO'S PAYABLE TO
CENTRAL MEDIA
9 COLTMAN ST. HULL HU3 2SG
TEL: (0482) 26380

DESKTOP

3" CF2 AMSOFT DISCS

£25 for 10
£13 for 5
+ £1 P.&P. All individually cased.

CF2 Storage Box

ONLY £4.95 + £1 P.&P.
(£4.50 with 10 discs)

FREE CATALOGUE
PCW/PC software, labels, paper, 5¼" discs etc. Phone for copy

We will undercut any cheaper prices in this magazine!
(All prices include VAT)

YOUR No.1 CHOICE
AMX Mouse..... £69.00
3" Storage Box (25)..... £8.50
PCW Ribbon (inc. P.&P.) £4.75
Use Desk International. £45.00
PCW Desk Covers..... £19.85
All + £1 p&p.
Full range of cables, paper, labels & software.

0388 767244
Order by phone – pay later
(235)

Send for details or order from:
Desktop, 11 West Street, Hett, Co. Durham DH6 5LS
Telesales 0388 767244/813035 (24 hours - 7 days)
SAME DAY DESPATCH

BLANK CASSETTES

WITH LIBRARY CASES

	C10	C15	C20	C30
20	7.50	7.70	7.90	8.70
50	16.00	16.20	16.90	18.50
100	29.00	30.00	31.00	35.00

Fully Inclusive (C.O.D. £1 extra)

DISKS

10 5¼ DS/DD £6·50 inc. case
10 3½" SS/DD £16 inc. case
10 3" AMSOFT £26 inc. case

MEMOTECH COMPUTERS AND ACCESSORIES

MTX 512 COMPUTER	£65.00
DMX 80 PRINTER	£150.00
RS232	£35.00
PASCAL ROM	£35.00
SPECULATOR ROM	£35.00
½ mb. DISK DRIVE & INTERFACE	£170
1 mb. DISK DRIVE & INTERFACE	£175

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

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

Atari 800 XL / 130 XE
Essential Utilities

Transdisk Version 3.0
The most powerful tape to disc system for the Atari now made even better. Transfers commercial, machine code, "boot" cassette games or any other software to disc. Single, multi-stage and now even non-standard format tapes present no problem to Transdisk. Plus, enjoy the convenience of loading and running your newly transferred software from an autorun disc menu. No other tape to disc utility for the Atari is as powerful or successful as this! £19.95 inc. Supplied on disc with instructions.

The Freezer!
An amazing new utility for the Atari! "Freeze!" programs while they are RUNNING on your computer. The Freezer then takes over control and allows you to make a back-up copy of the frozen program. The back-up copy will load, and restart from the frozen point, on ANY Atari XL/XE computer, independent of The Freezer! Freezes disc OR tape programs even those that are heavily protected! Easy to use – hit one key to freeze the program in memory then insert a blank disc and hit another key to save it – that's it! £19.95 inc.
Send an S.A.E. or phone for more details of these utilities.
Special offer order both programmes for £35.00
Make Cheque or P.O. payable to DIGICOMM and send your order to:

DIGICOMM
170 Bradwell Common Boulevard, Milton Keynes, Bucks MK13 8BG. Tel: 0908 663708. (121)

DISCS

3" per 10		
AMSOFT CF2		£26.95
AMSOFT CF2 IN PROTO BOX		£31.95
3·5" per 10		
MAXELL MF1DD	SSDD	£22.43
MAXELL MF2DD	DSDD	£32.63
SONY D3440	SSDD	£19.99
SONY D4440	DSDD	£32.95
VERBATIM MF350	SSDD	£19.98
UNBRANDED (GUARANTEED)	SSDD	£15.95
UNBRANDED (LIFETIME)	DSDD	£19.95
5-25" per 10		
MAXELL MD1D	SSDD	£12.95
MAXELL MD2D	DSDD	£14.95
VERBATIM MD250-01	DSDD	£12.95
VERBATIM MD525-01	SSDD	£12.95
VERBATIM MD550-01	DSDD	£16.49
GOLDSTAR/RPS	DSDD	£8.99

All discs cert. 100% error free and are guaranteed for life
Educational and official orders are welcome
All prices inc. VAT and P&P. NO HIDDEN EXTRAS!
(66)

RUGBY MICRO SPARES
30 OXFORD ST, RUGBY
CV21 3NF (0788) 71643
Telex 312242 MIDTLXG

FOR SALE

AMSTRAD SOFTWARE SALES AND HIRE

DISCOUNT PRICES
100s OF TITLES
FAST EFFICIENT SERVICE
Details from:
K & M COMPUTERS,
40 FAIRSTEAD, BIRCH GREEN, SKELMERSDALE, LANCS WN8 6RD (163)

MAKE MONEY WITH YOUR MICRO

Earn as much or as little as you like, working from home. A successful business idea!!
FREE details from:
AMREX Promotions (C5), Freepost, Colchester CO1 1BR.
No Stamp required (261)

QL QL QL QL WITH

TAXAN/KAGA or CANON PRINTERS
(TAXAN KP810, KP910 and CANON PW1080A, PW1156A)

If you would like the highest quality printer output, then write or phone for a (FREE) 7 page demonstration of "CuePrint" with "Printer Toolkit"

MUST BE SEEN TO BE BELIEVED

D. A. Burridge, 23 Cromwell Avenue, Hammersmith, London W6 9LA.
Tel: 01-748 3437 (256)

LEASE PURCHASE

Amstrad PC System
for under
£9.00 per week
Telephone: 0279 726488 (246)

BRANDED DISCS
Incredible prices

All discs supplied in original packing and fully guaranteed

Prices per box of ten

3.5" Verbatim Datalife SSDD 135tpi MF350	£21.75
3.5" Sony SSDD 135tpi OMD3440	£19.45
3.5" Memorex DSDD 135tpi MX3460	£24.30
5.25" Verbatim Datalife SSDD 48tpi MD525	£12.75
5.25" Verbatim Datalife DSDD 48tpi MD550	£15.35
5.25" Verbatim Verex SSDD 48tpi MD200	£11.00
5.25" Verbatim Verex DSDD 48tpi MD250	£12.45
5.25" Maxell DSDD 48tpi MD2-D	£15.00

All inclusive prices. No extra to pay.
Government and educational orders welcome.
Please make cheques or postal orders payable to:

ORIOLE LIMITED
Dept. OBV, P.O. Box 297, London N3 2TS

PUBLIC DOMAIN SOFTWARE FOR IBM PC COMPATIBLES

Massive selection of discs available from only £3.00 per disc.
NO MEMBERSHIP FEES
Send 18p stamp for free catalogue
PC-STAR
P.O. Box 164, Cardiff CF5 3YB. (220)

ATARI ST PUBLIC DOMAIN

Why reinvent the wheel? We have a large selection of languages, demo's, utilities, comm's and games etc, available. A stamp for our list will save you hours of frustration.
Discs from £3.50 to £4.50
MCSOFT
9 Abingdon Gardens, Bath, Avon BA2 2UY (178)

SPECTRUM 484K+, v.g.c. boxed, £50. Microdrive £75. I/face 1 (faulty) £5. Complete Spectrum (set) £5. Tel: 01-585 2656. Evenings.

ATARI 800XL, 1050 disc drive, 1010 program recorder, perfect condition, plus various discs and books. £200. Tel: Tim, 01-874 0331.

COVERS

CONCEPT COVERS

Dust covers for all computers

Atari ST range, 4-piece set	£10.50
PC1512, 3-piece set	£9.00
PCW range, 3-piece set	£8.95
CPC range, 2-piece set	£8.00
Commodore C64, 1-piece	£3.50
Spectrum +2	£4.00
BBC master range	£10.50

Also covers made to your specification.
For details write or phone:

Concept Covers 24 Wolstenbury Rd, Rustington, West Sussex BN16 3LB.
Tel: 0903 78945 (258)

RIBBONS

FABRIC RIBBON RE-INKING

Introductory offer: £1.50 each
Send cassettes and payment to:
ALADDINK (Dept PC)
4 Hurkur Crescent, Eyemouth, Berwickshire TD14 5AP
We will advise normal price for your ribbon
Tel: 08907 50965 (172)

Compatible AMSTRAD ribbons (not DMP 2000) in non-standard colours. Also for most printers.
Details from
Pearldeck Trading Ltd,
FREEPOST, Billingford, DISS, Norfolk IP21 4BR
Telephone: 0379 52000 (247)

FOR SALE

PCW6. Do you own a home micro? Do you want something more than the usual boring games? This is most certainly for you. Don't just play at life, become part of it by starting your own HOME BASE BUSINESS. The benefits are many and varied. Full or part-time, for FREE details S.A.E. to: Mr G. McGovern (PCW7), 97 Pilton Place, King and Queen Street, Walworth, London SE17 1DR.

MONEY MAKING opportunity for all Amstrad users. S.A.E. please to Allendata, 1 Lorn Road, Dunbeg Connel, Argyll PA37 1QG.

AMSTRAD CPC 6128, colour monitor, v.g.c., joystick, some games, data processor. Sell £300. Tel: Southport (0704) 67342.

PRINTER Tandy CGP115, 4-pen colour graphic printer, serial or parallel interface, suitable TRS80 + Dragon. £50 o.n.o. Tel: 01-232 1987.

COMMODORE 128, 1570 disc drive, Speedking joystick, loads of disc software, some tapes, two months old. £350. Also loads of Spectrum software. Tel: Russell 01-680 2122 or 01-777 5155.

HELLUVA BARGAIN! Amstrad PCW8256 for sale, just serviced, The Pawn, spare discs, manuals, £350. Why buy a new one? Tel: Havant 478081 (after 7pm please).

IBM PC fully loaded, 10 meg, 640K, Hercules, 2 ser/par Multimate, Lotus, dBase, Samna 4, Super Project+, Framework 2, Datamaster, plus more. No split: £1,950 o.n.o. 01-543 6585.

ATARI 800XL fitted o.s. controller card, £65. XC11, £25. Mapping Atari, DE RE Atari, Sams, programmer's reference guide, 6502 assembly language programming, £10 each. Tel: Romford 46700.

BBC MODEL B, 800K dual 40/80 disc drive (psu), 32K sideways Ram/Rom board, 700 programs, 60 Roms, all for £400. Tel: 05827 69152.

IBM and Apple software for sale. Send S.A.E. to Tom Dragic, 2A Sutton Court Mansions, London W4 3JH or phone 01-994 7507.

WANTED: Second 3" disc drive, pay around £45, plus extra for postage. Contact Mr. Wyer, 109 Gregory Boulevard, Nottingham NG7 5JH.

WANTED: Owners who want to earn money with their computers, hours to suit you, no programming. Interested? Send S.A.E., Barleycorn Marketing (PCW1), 65 Capsey Road, Ifield, Crawley, Sussex RH11 0UF.

WANTED for disabled child. Solid state games modules for Texas TI 99/4A. Also consider keyboard/p.s.u./modulator, if reasonable price, for spare. Mr. C. Truesdale, 4 Captains Walk, Loddon, Norfolk NR14 6DJ.

SHARP MZ80A business system complete with twin disc drives and printer, 40/80 characters on the screen. Any offers? Will split. Tel: 0293 885833.

AMSTRAD 6128 (3 months old) + data recorder, 2 joysticks, some games on disc and some on tape. Tel: Maidenhead (0628) 24620.

FOR SALE CBM64, 2 joysticks, 6 computer games and datasette, plus The Hornet remote controlled car. All for just £225. Tel: St. Albans 59519.

SPECTRUM 128 Opus disc drive, tape recorder, 126 tapes, joysticks, interfaces, multi face, plus more, worth £1,200, sell for £580 o.n.o. Tel: 0462 56755. After 6pm.

PENPAL WANTED with C64, to swap games and tips. All genuine letters answered, cassette or disc. Write to Mark Kinsella, Johnstown Sea Road, Arklow, Wicklow, Eire.

COMMODORE 64 for sale, plus C2N, plus £100s worth of software, little used, excellent condition. £180 o.n.o. Tel: 01-947 4699. Evenings.

ATARI TEMPEST genuine arcade machine, good-looking, fully working, with keys, manuals etc. Superb fast colour converter graphics. £200. Tel: Horley 0293 771876. Afternoons and Evenings.

COMMODORE 64, disc drive, cassette deck, plus over 200 games, quick sale hence £280. Also 120 full double sided discs, £80. Also sound sampler, £25, sound expander plus full keyboard, £80. Tel: 01-530 4269.

ATARI 800XL, 64K memory, disc drive, tape recorder, 2 joysticks, 2 Trakballs and around 70 software titles, £250. Tel: 01-670 8425.

ATARI 520STM ½ meg drive, mono monitor, LX80 printer, 14" portable colour TV, lots of software, £500 o.n.o. Will deliver. Tel: 0293 28464.

LABELS

Self Adhesive Disk & Cassette Labels

DISK LABELS - 3" & 3½" Disk labels, 71 x 69 mm, on tractor feed backing for computer overprinting. White: 500 - £15.55, 1000 - £22.05, 2000 - £25.69. Tinted labels in - Blue, Pink, Grey, Cream, Yellow, Orange, Green: 500 - £21.35, 1000 - £31.05, 2000 - £43.63.
5¼" Disk, 95 x 36 mm. White: 500 - £12.75, 1000 - £17.75, 2000 - £20.56. Tints as above: 500 - £15.20, 1000 - £24.65, 2000 - £34.36.

CASSETTE LABELS - On tractor feed backing. Rolls of 500 labels. White - £14.66, Tinted - £16.90. A4 sheets, 12 labels per sheet, 100 labels - £3.50, 200 - £6.00, 1000 - £21.85
All prices are inclusive of VAT & carriage.

We are specialist computer label makers and can provide printed labels in 24/48 hrs. For price list and sample brochure of our full range of self adhesive micro computer labels plus details of quantity discounts
☎ Sittingbourne (0795) 28425 (24 hrs)

Industrial Process
Unit A4 Smeed-Dean Centre Sittingbourne Kent ME10 3RN
Self Adhesive Labels - **SUPERFAST**

DUPLICATION

DATA/AUDIO cassette duplicating from 23p: blank or printed labels/cassettes, inlays: IBMPC/etc. disc duplication and blanks. An erasure and rerecording service from 12p. (196)
Price list from:
SIMON STABLE PROMOTIONS, 20 Westend, Launton, Nr. Bicester, Oxon OX6 0DF.
Tel: 0869 252831 8.15am–6.30pm Mon.–Fri.

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 28TV

COMPUTER REPAIRS

Fixed Super Low Prices!
Inclusive of parts, labour and VAT

FIRST AID FOR TECHNOLOGY

1 week turnround
Free collection/delivery available for local area

★ INTRODUCTORY OFFERS ★

SPECTRUMS	£14 inc. + Free Game
C64	£22 inc. + Free Game
C16	£18 inc.
VIC20, C+4	£22 inc.
BBC	£32 inc.
ELECTRON	£19 inc.
AMSTRAD 464	£32 inc. + Free Game
C & N CASSETTE UNITS	£19 inc.
C64 P.S.U. FOR SALE	£20 inc.

Please enclose payment with item – 3 month warranty on repair
Please enclose advert with repair

W.T.S. ELECTRONICS (182)
5–9 Portland Road, Luton, Beds LU4 8AT. Tel: 0582 458375. Telex: 265871

COMPUTER BROKEN?

Send it to the experts!

★★★ *LIMITED SPECIAL OFFERS* ★★★

Spectrum/Plus repairs	£14.95
CBM 64/Vic 20/C16/+4 repairs	£19.95

Vic 20 Owners

Upgrade your old Vic 20 to a CBM 64 for only £79.95.

BBC Owners

Acorn speech upgrades only £19.95
★ 1 week turnaround ★ 3 month guarantee ★

Please make cheques/postal orders payable to:

MICROMEND
Unit 1, The Old School, Main Street, Farcet, Peterborough PE7 3DB
Tel: (0733) 241718 (251)

FAST COMPUTER REPAIR CENTRE – IN LONDON
*BBC Micro, Commodore, Spectrum
*Amstrad, Others
*We sell spare parts
*Used Micros bought and sold
*Eprom Programming Service
Phone: 01-863 7166
PROMPT ELECTRONICS
Unit 4, 15 Springfield Road, Harrow, Middx HA1 1QF
(entrance in Amersham Road) (70)

FOR FAST RELIABLE REPAIR

SPECTRUM	**£16.00**
ORIC	**£25.00**

Prices inc. parts, VAT, P.&P.
We give 3 months warranty on repair. Please send computer with details of fault and cheque made out to:
CHILTERN COMPUTER CENTRE
100 Hightown Road, Luton, Beds LU2 0DQ
Tel: 0582 400305 (184)

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
80A Warwick Avenue, Quorn, Loughborough
Leicestershire LE12 8HD
Tel: 0509 412604

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 COMPUTERS FOR HIRE
COMPUTER HIRE SERVICES
294A CALEDONIAN ROAD
LONDON N1 1BA (9)

PCW6. Do you own a home micro? Do you want something more than the usual boring games? This is most certainly for you. Don't just play at life, become part of it by starting your own HOME BASE BUSINESS. The benefits are many and varied. Full or part-time, for FREE details S.A.E. to: Mr G. McGovern, (PCW6), 97 Pilton Place, King and Queen Street, Walworth, London SE17 1DR.

ATARI ST OWNERS – write now for a free copy of the latest 24-page ST-Club Newsletter and our public domain disc library catalogue: ST-Club (PCW387), P.O. Box 20, Hertford SG13 8NN. (Stamp appreciated).

CBM 64 AND CASSETTE UNIT COMPETITION Pro 5000 joystick. Introduction to Basic Programming kit, over £300 worth of games and books. Sell £150. Tel: 0621 782565.

CBM64 and BBC Business Software for sale, including Anagram Micro Simplex Gemini batteries inc. acc. £30 each. Tel: Courtney on 01-989 2136.

ATARI 520 STM with ½ megabyte disc drive, manuals, mouse, all for £270 boxed, working. Need the cash! Phone Andy on 01-514 1995 after 7 pm.

Dealers

BIRMINGHAM

SOFTWARE EXPRESS
COMPUTER SYSTEMS LTD
ATARI *AMIGA*
We have the largest range of Atari 8 and 16-bit software in the Midlands.
Mail order service available.
514–516 Alum Rock Road, Alum Rock, Birmingham B8 3HX
Tel: 021-328 3585 (198)

ESSEX

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

NOBLES
14-17 EASTERN ESPLANADE
SOUTHEND-ON-SEA, ESSEX
Tel: (0702) 63377/8 PL908

AMSTRAD CPC 464, green screen, joystick, lightpen, MP1 TV modulator, over £300 worth software. Cost over £500, accept £300 o.n.o. Tel: Walton-on-Thames (0932) 231024. After 6pm or weekends.

ATARI ST SOFTWARE CLUB FREE membership. For details ring RM9B 0322 526282 ext. 2251 or send s.a.e. Room 9B, Sycamore House, Bexley Hospital, Bexley, Kent DA5 2BW.

COMMODORE 128, 1570 disc drive, cassette deck, modem, £350 worth software, joystick, disc box, ten blank discs, seven discs of Compunet Art demos. Bargain at £275 o.n.o. Tel: 0442 56052.

ATARI 1040STF, monochrome monitor, documentation and software, perfect condition. £550 o.n.o. Also extra software. Tel: Phil Spencer, Clitheroe (0200) 28163.

SWAP CMB64, £700 s/w and C2N, plus music expansion system, including full size keyboard, for good Epson printer or compatible Atari FCC i/f and Indusg-7 disc drive. Tel: Maidenhead 32875.

AMSTRAD CPC 464 colour monitor, disc drive, joystick, over fifty games, utilities including Tasword, Lazer-basic, Trivial Pursuit, printer cable, books, magazines. £260. Tel: 0268 690850.

SINCLAIR QL as new, in box, plus over £200 worth books, blank microdrives and original software, for only £150 o.n.o. Also includes V2.3 Quill w/processor etc. Tel: 01-751 4110.

Dealers

MIDDLESEX

SAXON SOFTWARE
Software and hardware for all Atari, IBM and Amiga machines.
Send for full list of details:
90 Neild Road
Hayes
Middlesex (255)

GLASGOW

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

GLASGOW COMPUTER CENTRE
Atari appointed dealer and Service Centre
Specialists in Atari ST Computers
VIRGINIA GALLERIES
(1st FLOOR)
33 VIRGINIA STREET
GLASGOW G1 1TU
TEL: 041-552 1522 (138)

BBC B Acorn DFS, Teletext adaptor, Cumana 100K disc drive, tape recorder, joystick, with lots of games, magazines, all in excellent condition. Bargain price £520. Tel: Jimmy after 5pm (Plumstead), 01-854 6283.

YAMAHA CX5M VOICES. Varied selection of 144 on cassette, plus CX5M user tips sheet, only £4.00. Paul Brown, 19 Wren Road, Sidcup, Kent DA14 4LY.

COMMODORE 64 software, all originals, wargames, sports and adventure games all on disc, and all from U.S.A. Eighteen games in total. £300 worth for £100. Tel: 0442 63308. After 4pm.

SWAP CBM64, C2N and £300 software, for Atari 800XL with disc or sell £150. Also Casio hand-held computer, databank, qwerty keyboard, ten program areas 2K/4K, ramcards, manuals. £69. Tel: 0932 54281.

COMMODORE 64, 1541 disc drive, MPS 803 printer, C2N cassette, joystick, reference guide and £400 worth of games on cassette and disc. £290. Tel: 0959 73992.

C64, disc drive, tape deck, colour monitor, joysticks, mouse, cartridges, tapes, discs, new keyboard, disc box, software includes Summer/Winter Games, The Artist, Disc Disector. £475. Tel: Chris 0524 762197.

MACINTOSH 512K/800 (only three months old – Apple guarantee valid until March 1988), Apple 400K external disc drive, Macwrite word-processor, Imagewriter connector cable, pad connector cable for link with mainframe computer. Price £1,350. If interested phone 01-435 9199 after 6pm on weekdays.

AMSTRAD CPC6128, colour monitor, joystick, discs, three extra books and software, including Pascal I/T Plus, Protext, Elite and Laser Genius, 8 months old. £300 o.n.o. Tel: Birmingham 021-783 4233.

ATARI 800XL, 64K memory, disc drive, tape recorder, 2 joysticks, 2 Trackballs, and around 70 software titles, £250. Tel: 01-670 8425 between 1.30pm and 9.30pm ask for Tolkien.

Dealers

KENT

LIGHTHOUSE COMPUTER SERVICES
★ Specialists in Amstrad
★ Mail Order Service
★ Software for Amstrad – Single Drive a speciality
★ Hot-line help for Amstrad
OWNERS
9 Park Avenue, Deal, Kent CT14 9AL
Telephone:
(0304) 369313
(0304) 362049 (254)

LEEDS

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

COMMODORE 64, 1514 disc drive, daisywheel printer, C2N data cassette, joystick, interface and assorted software, including word-processor package. £350 (will split). Tel: 01-435 7714.

AMSTRAD PC 8512 with various s/w packages, including word processor and Supercalc 3, plus many others. £450 o.n.o. (reluctant sale!). Tel: (home) Reading 58601, (work) Bracknell 426511 ext. 222 (Joe).

ATARI hyper drive enhancement, for 1050 disc drive, allows true double density, faster reading and writing, and will back up protected software, easy plug-in installation. £40. Tel: 01-508 2671.

MAGIC FILER (Sage) database, £35, for Amstrad PCW. Tel: 01-902 0273 or write Moore, 3 Crawford Avenue, Wembley HA0 2HX.

ATARI USERS – happy board for 1050 wanted. Will give fair price or swap for large selection of software. Contact: Andrew, 13 Willow Road, Gurnos Estate, Merthyr Tydfil, South Wales CF47 9BA.

COMPLETE MEMOTECH business system, MTX512 computer, d/drive (3.5" 1Mb), CP/M, RS232 communication board, DMX80 printer, monochrome (high res) monitor, disc software, Newword, Supercalc, EDASM, utilities, arcade software, cables, manuals. £400. Tel: Alan 0946 63232.

AMSTRAD CPC6128, sound sampler, speech synthesiser, stereo speakers, Amdrum, mouse, 10 blank discs, over £300 software, joystick, books and magazines. Sell for incredible £450. Tel: 0232 615479. Ask for Daniel.

Z80! Z80! Z80! Z80! Programming expertise, does your company need it? Then write to: K. Jeffery, 27 St. Mary's Avenue, Gosport, Hants PO12 2HU.

COMMODORE 64, two cassette decks, joystick, Freeze Frame, and £1,100 worth of original software, all boxed, as new. Cost over £1,400, sell for £400 o.n.o. Tel: Huddersfield 531496 (after 6pm).

COMMODORE 64 computer, datacassette, disc drive, joystick and over £300 worth of software, will sell for £300. Tel: Durham (091) 3780479. (after 6.30pm).

BBC B, dual 40/80 drive, Microvitec colour monitor, with metal plinth, plus 90 games on tape and disc. £550 the lot, offers or split. Tel: Ian 01-878 0068. Evenings only.

AMSTRAD CPC464, colour monitor, DD1 disc drive, software £230. Tel: 01-679 6133. Evenings.

AMIGA A100 for sale – 512K colour monitor, 70 discs, including imported software, mouse and accessories. £850 o.n.o. Tel: Andy 0606 55256.

Dealers

LONDON

GALLERY SOFTWARE
1st FLOOR
THE ARNDALE CENT,
WANDSWORTH,
LONDON SW18
Tel: 01-870 4941 PL29

NEW RELEASES

Your complete guide to all the software released this week

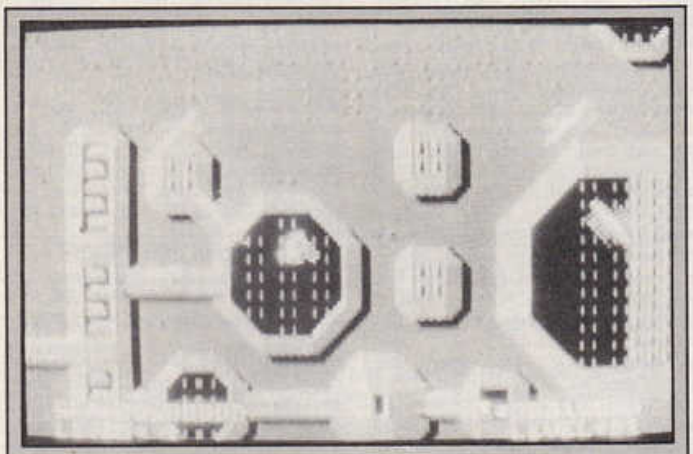
Amstrad CPC

Program *The Fifth Quadrant* **Type** Arcade **Price** £8.95 (tape), £12.95 (disc) **Supplier** Bubble Bus Software, 87 High Street, Tonbridge TN9 1RX.

Intergalactic survey crew is overrun by alien Zimen – you control any of four robot characters trying to regain control of the ship by reprogramming the computers.

Your heroes, Slog, Plot, Knut and Bodd (we'll all have names like that in the future, you know), each have different characteristics which have to be exploited to translate the alien language and control the ship's systems.

Pleasing 3-D perspective over 230 locations.



The latest Nexus Production effort is a scrolling shooter which borrows all the latest gimmicks in this style of game.

The idea is that the Earth has run out of energy and sends a fleet off to look for some. However, lying in wait are the bad guys, and you happen to get there ahead of the main fleet. So, you have to go over all the surfaces in this region of space, blowing things up.

With motivation like that I know you'll soon be reaching for a joystick. In play, the game comes over as a cross between *Terra Cresta*, *Lightforce* and bits of *Nemesis*. The scrolling of the backgrounds is not overly impressive, with sporadic jerks occurring, and neither are the sprites. They persistently flicker and the detection around the front end of your ship is a trifle suspect. It's graphically quite appealing, however.

Shooting certain of the ground based constructions results in extra bits of equipment floating towards you. These include extra speed (initially it's slow) and weapons. Without them, you'll probably start wondering when the game's going to start.

There's no doubt that as a shoot 'em up, *Hades Nebula* has all the right ingredients, and the bird's eye perspective, *à la Lightforce*, adds extra interest.

All this would be acceptable for a budget game, but *Hades Nebula* is a full price release.

And as budget titles got better, so the full-priced games have to stay several leaps ahead. And *Hades Nebula* is not 'several leaps' ahead.

Duncan Evans

Program *Tournament Leaderboard* **Type** Golf simulation **Price** £4.99 (tape), £9.99 (disc) **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

Four more 18-hole courses to rejuvenate Amstrad *Leaderboard* addicts.

Program *Metrocross* **Type** Arcade **Price** £9.99 (tape), £14.99 (disc) **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

Program *Thing Bounces Back* **Type** Arcade **Price** £9.99 (tape), £14.99 (disc) **Supplier** Gremlin Graphics, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

See panel for comment.

Program *Ballcrazy* **Type** Arcade **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Program *Enterprise* **Type** Arcade **Price** £8.95 **Supplier** Melbourne House, 8-10 Paul Street, London EC2A 4JH.

Program *World Games* **Type** Simulation **Price** £9.99 (tape), £14.99 (disc) **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

Program *Shadows of Mordor* **Type** Arcade **Price** £8.95 (tape) **Supplier** Melbourne House, 8-10 Paul Street, London EC2A 4JH.

More hobbitry from Melbourne House's *Lord of the Rings* licence.

Program *Mystery of Arkham Manor* **Type** Adventure **Price** £7.95 **Supplier** Melbourne House, 8-10 Paul Street, London EC2A 4JH.

Program *Barbarian* **Type** Arcade/Combat **Price** £9.99 **Supplier** Palace Software, 275 Pentonville Road, London N1 9NL.

Amstrad PCW

Program *Leaderboard* **Type** Golf simulation **Price** £19.99 **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

Never have the greens looked so green.

Program *The Desktop Publisher* **Type** DTP utility **Price** £69.95 with AMX mouse and interface – introductory price until June 30 **Supplier** Database Software, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

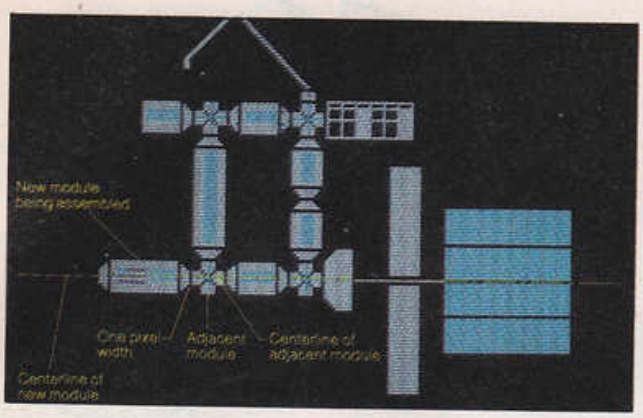
Third desktop publishing package for the PCW in as many months, following the well-publicised *Fleet Street Editor* and *Newsdesk International* by Electric Studio.

Database's offering follows the strategy of its *Mini Office* products – the basic facilities at a lower price.

We'll look at *The Desktop Publisher* in more detail in a later issue. Meanwhile, note that the £69.95 for program plus mouse quoted above is an introductory price and goes up to £79.95 in July.

BBC

Program *Temple of Terror* **Type** Adventure **Price** £7.99 (tape), £12.99 (disc) **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.



The power of NASA at your fingertips

The last couple of months have been a revelation for IBM PC compatible games. I have had to radically alter my opinion of the machines as businesslike but boring.

After the phenomenal *Star Flight* comes *Space M+A+X* (affectionately known as *Max* hereafter), from the previously unknown Final Frontier Software.

Max is billed as a "space station construction simulator", and the emphasis really is on the simulation.

Big business

It was written by T L Keller, a former programmer at the Jet Propulsion Lab in Pasadena, where he wrote management systems for the Mariner, Viking and Voyager missions so he is a man who knows big business.

When NASA eventually gets off its collective bum and starts a space station project, you get the impression they could use this program as it stands.

Although there are some excellent graphic displays, *Max* is predominantly text-based and menu-driven.

You have to build the station within a given time limit (around 90 days). Using shuttles and unmanned rocket vehicles, you must transport the necessary building blocks and crew into orbit, not forgetting enough food, water, air and medical supplies to keep everyone up there healthy.

These are unionised employees and if conditions are poor, or unsafe, you'll have a strike on your hands.

Assembling the station itself is the key to the program.

Every module needs a certain number of days to assemble and activate, and you can't leave people up there until you have heat, electricity, a command module, living quarters and sundry other bits and pieces.

Since the idea is to create a working station, and not an orbiting bed and breakfast hostel, you'll also have to add experimental labs and materials processing unit (*Max* stands for Materials processing, Astrophysics and experimental facilities).

New drugs

You don't get to fly the shuttle, but you do have to keep an eye on weather for launches and landings and decide whether to hold on the pad or in orbit (of course, time is money).

Provided that you meet the time limit, and get your station working, you can then clock up the earnings by producing new drugs, advanced metal alloys and other wondrous things for which earthbound industries will pay through the nose.

The package comprises three discs, and an incredible manual printed in full colour with official NASA photographs and more detail about space stations than you could want to know – but you need to know.

Max isn't so much a game as a truly realistic management simulation. However, it is entertaining and amusing, and not all "games" can claim that.

It will take you many hours to get a station up and running without forgetting those small but all-important details, and endless attempts after that to make a killing in manufacturing.

Lavish manual

At £35 it's almost a bargain, especially given the lavish manual and size of the program. And it will be a long time before you get any closer to this particular reality.

Peter Worlock

Program *Space M+A+X* **Micro** IBM PC and compatibles **Price** £34.95 protected £41.95 unprotected **Supplier** Final Frontier Software, 136 Regent Street, London W1R 5SA.

Operating screens: positioning the module prior to docking and status reports

3 ACTION PACKED GAMES!

OINK!

£8.95
CBM, AMS, SPEC
CASSETTE

£14.95
CBM, AMS
DISC

PETE'S PIMPLE

RUBBISH MAN

TOM THUG

CRL

Hot Line: 01-533 2918

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

Commodore 64/128

Program *Dark Empire* **Type** Strategy **Price** £9.95 **Supplier** Lothlorien, Victory House, 14 Leicester Place, London WC2H 7NB.

Program *Metrocross* **Type** Arcade **Price** £9.99 (tape), £14.99 (disc) **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

Program *Stifflip & Co* **Type** Arcade adventure **Price** £9.99 (tape), £12.99 (disc) **Supplier** Palace Software, 275 Pentonville Road, London N1 9NL.

Stylish icon-driven adventure set in the era of Biggles; the sun never setting on the Empire and Johnny Dago getting a well-deserved thrashing at the hands of true blue Viscount Stifflip.

Superb graphics and screen handling, complex gamesplay and excellent Richard Joseph music.

Program *Conflicts 2* **Type** Strategy compilation **Price** £9.95 (tape), £14.95 (disc) **Supplier** PSS, 452 Stoney Stanton Road, Coventry CV6 5DG.

Subtitled *Great Battles of the Pacific*, this is the second in a series of compilations by wargaming specialist PSS.

This one comprises *Battle for Midway* and *Iwo Jima*, plus, exclusively for Commodore buyers, the new *Okinawa*.

Program *Max Torque* **Type** Racing simulation **Price** £8.95 (tape), £12.95 (disc) **Supplier** Bubble Bus Software, 87 High Street, Tonbridge, Kent TN7 1RX.

Motorbike racing simulation claiming authentic recreation of bike steering, gears, throttle and brake characteristics for seven different (bike) machines.

Possibly too similar to *Enduro Racer* to make much impact.

Program *Shadows of Mordor* **Type** Adventure **Price** £8.95 (tape), £14.95 (disc) **Supplier** Melbourne House, 8-10 Paul Street, London EC2A 4JH.

Program *Doc the Destroyer* **Type** Arcade **Price** £8.95 (tape), £14.95 (disc) **Supplier** Melbourne House, 8-10 Paul Street, London EC2A 4JH.

Program *Barbarian* **Type** Arcade/Combat **Price** £9.99 **Supplier** Palace Software, 275 Pentonville Road, London N1 9NL.

See panel for comment.

Program *Thing Bounces Back* **Type** Arcade **Price** £9.99 (tape), £14.99 (disc) **Supplier** Gremlin Graphics, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

See panel for comment.

Program *Hades Nebula* **Type** Arcade **Price** £9.95 (tape), £12.95 (disc) **Supplier** Nexus Productions, DSB House, 30 High Street, Beckenham, Kent BR2 0XW.

See panel for comment.

Barbarian **is rapidly becoming more famous for its advertising than the actual program, thanks to the prominence given to pin-up floozy Maria Whittaker. Depending on your taste, you may or may not be glad to learn that the woman is all over the inlay and on a large poster inside, where she poses with a barbarian with a big weapon.**

The game itself (yes, there actually is one) casts you as the iron thewed unwashed one, out to rescue aforementioned floozy, who is a princess of somewhere.

Set against a variety of backgrounds you and your sword must defeat a plethora of similarly armed foes. The range of possible actions are as follows, jump, protect body, move forward, roll forward, crouch, roll back, move back and protect head.

Using the fire button on the joystick gives you another eight possibilities. Neck chop, head butt, body chop, kick, leg chop, overhead chop, and web of death (!).

To win a contest you must either inflict a set number of blows on your opponent or behead him with one blow. Should you try for the lucky blow and succeed you are rewarded with the sight of a spurt of blood and a head bouncing onto the floor. A small green thing then appears and drags the body off screen while kicking the detached head along. Yeh, it's a tasteful package all round.

The Amstrad version is easily the best, with animation rather shaky on the Commodore. On all, however, the sprites are large and fighting is entertaining enough to keep you taking on the louts one more time. If you're looking for *Way of the Exploding Fist* with sex and violence then you'll probably find *Barbarian* an ideal buy.

Duncan Evans

Program *The Fifth Quadrant* **Type** Arcade **Price** £8.95 (tape), £12.95 (disc) **Supplier** Bubble Bus Software, 87 High Street, Tonbridge, Kent TN9 1RX.

Program *Killed Until Dead* **Type** Adventure **Price** £9.99 (tape), £14.99 (disc) **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

IBM PC and Compatibles

Program *Ability Plus* **Type** Integrated business pack **Price** £182.85 **Supplier** Migent Software, 37 Dover Street, London W1X 3RB.

MSX

Program *Cosmic Shock Absorber* **Type** Arcade **Price** £8.95 **Supplier** Martech, Martech House, Bay Terrace, Pevensey Bay, East Sussex, BN2 6EE.

POPULAR Computing WEEKLY

Subscribe now to **Popular Computing Weekly** and we'll send you your own **Mini Office program FREE.**

- **Word Processor**
- **Database**
- **Spreadsheet**
- **Graphics**

MINI OFFICE

ORDER FORM

Please enter my annual subscription to *Popular Computing Weekly* at **£25.00 U.K. £39.95 Overseas** and send me my FREE MINI OFFICE program as indicated below.

Send me **MINI OFFICE** for: ☐ Amstrad ☐ Commodore ☐ Spectrum ☐ Electron ☐ BBC

☐ Please debit my Access/Visa/AmEx card no: ☐ I enclose a cheque made payable to Sunshine Publications Ltd.

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Expiry date: ..... Signature: .....

Name: .....

Address: .....

.....

Return this form to: PCW Subs, 12–13 Little Newport Street, London WC2H 7PP, U.K.

FREE SOFTWARE...

Is what you get when you buy an Amstrad PCW, but how many people make the most of it? Now, for the first time, this double package from two of Britain's most experienced computer authors takes the lid off the PCW's hidden power:

- **WORD PROCESSING:** everything you always wanted to know about templates, layouts, standardised forms, odd-sized formats — from the ABC of LocoScript to the sophisticated techniques of the modern office
- **CP/M:** sensible working methods for a secure and efficient system
- **GSX:** complete details of how to get presentation-quality graphics from straightforward Basic programs
- **LOGO:** graphics and list processing for the first time user
- **BASIC:** your own suite of business programs including a database, accounts program, bank account record, invoice creator and many more.

Practical Amstrad Word Processing and The Amstrad Companion — 440 pages of ideas that will turn your PCW into the power house it was meant to be! **You can obtain the books at only £6.00 each or an amazing price of £10.00 for the two including p&p.**

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

Please send me _____ copies of practical Amstrad Word Processing and Amstrad Companion (both for £10 inc. 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 _____

MSX

Program *Thing Bounces Back* **Type** Arcade **Price** £9.99 (tape), £14.99 (disc) **Supplier** Gremlin Graphics, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

See panel for comment.

Program *Master Chess* **Type** Simulation **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Program *Uchi Mata* **Type** Judo simulation **Price** £9.95 **Supplier** Martech, Martech House, Bay Terrace, Pevensey Bay, East Sussex, BN2 6EE.

Conversion of underrated judo simulation. *Uchi Mata* first appeared just at the wrong end of the martial arts game boom, and most people never quite got the idea that it wasn't a repackaged Brian Jacks, nor Martech's answer to *Fist*.

In fact, it's rather more complex – certainly less easy to get into than a karate basher, but probably more long lasting when you do.

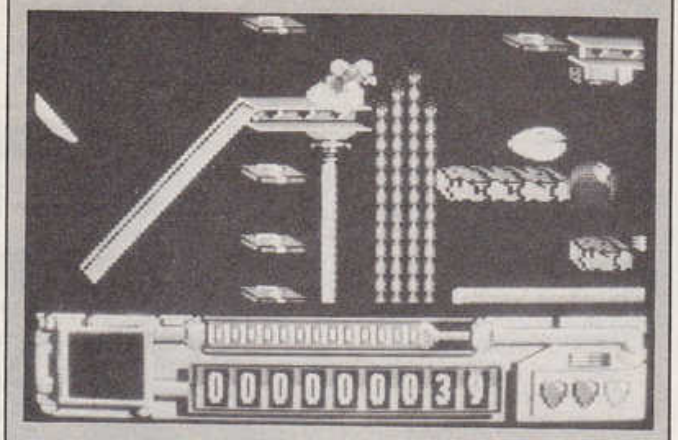
Spectrum

Program *Doc the Destroyer* **Type** Arcade **Price** £7.95 **Supplier** Melbourne House, 8-10 Paul Street, London EC2A 4JH.

Program *Barbarian* **Type** Arcade/Combat **Price** £9.99 **Supplier** Palace Software, 275 Pentonville Road, London W1 9NL.

Program *Conflicts 2* **Type** Strategy compilation **Price** £7.95 **Supplier** PSS, 452 Stoney Stanton Road, Coventry CV6 5DG.

Spectrum version of PSS's latest compilation comprises *Battle for Midway* and *Iwo Jima*.



Almost old enough to be called a classic, *Thing On A Spring* was one of Gremlin Graphics' earlier releases, and set many new standards for complexity and programming polish. The belated sequel, *Thing Bounces Back*, is just as good technically, with excellent music, effects and sprite control, but doesn't make quite the same impact. Things have moved on, if you'll pardon the pun.

The Commodore 64 version – far better than the Amstrad, Spectrum or MSX games – is the product of no fewer than seven programmers. Like most committee jobs, the game suffers from having everything thrown in fairly haphazardly, with some attempt to organise it into a game afterwards.

The opening screen sees Thing, on its mission to disable the computer of the evil goblin, zooming around a network of pipes in the old toy factory.

Controlling Thing's movement, reversing direction with the fire button, allows you to wind up at one of the exits leading to the eleval eight-way scrolling sub-games.

Each of these has a 12-screen area, and features a network of slides, platforms, escalators, bounce pads, blowers, doors, pipe entrances and mystery squares, some of which turn out to be booby-traps. Thing has to collect Roms, discs, cassettes and listing paper from each screen; opposing it are various meanies which attempt to drain his oil, squash him or otherwise bring him down.

£7.99 for the Spectrum and MSX versions is OK-ish, £9.99 for Amstrad and Commodore cassette is I think, pushing it a bit, and you will definitely not get £14.99 worth of pleasure from the Amstrad and Commodore discs. Still, sure to be a reasonable hit.

Chris Jenkins

CHARTS

Top Twenty

1	(1)	BMX Simulator	Code Masters
2	(4)	Football Manager	Addictive
3	(3)	Four Great Games	Microvalue
4	(5)	Gauntlet	US Gold
5	(6)	Six Pack	Elite
6	(2)	Enduro Racer	Activision
7	(7)	Feud	Bulldog
8	(18)	Konami's Coin-op Hits	Imagine
9	(11)	Five Star Games 2	Beau Jolly
10	(15)	Into the Eagle's Nest	Pandora
11	(9)	Army Moves	Imagine
12	(13)	Olympic Spectacular	Alternative
13	(17)	Ollie and Lisa	Firebird
14	(10)	180	Mastertronic
15	(16)	Milk Race	Mastertronic
16	(-)	Vampire	Code Masters
17	(12)	Head Over Heels	Ocean
18	(20)	Grand Prix Simulator	Code Masters
19	(-)	Arkanoid	Imagine
20	(-)	Paperboy	Elite

All figures compiled by Gallup/Microscope

Program *Dark Empire* **Type** Strategy **Price** £9.95 **Supplier** Lothlorien, Victory House, 14 Leicester Place, London WC2H 7NB.

Program *Tournament Leaderboard* **Type** Golf Simulation **Price** £4.99 **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

Program *Thing Bounces Back* **Type** Arcade **Price** £7.99 **Supplier** Gremlin Graphics, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

See panel for comment.

Program *Metrocross* **Type** Arcade **Price** £8.99 **Supplier** US Gold, Units 2 and 3, Holford Way, Holford, Birmingham B6 7AX.

Program *Ballcrazy* **Type** Arcade **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Games with a conscience

I use my computer for producing original education material for my work, or for word processing. The occasional outing on *Flight Path 737*, ancient though it now is, is as much a challenge after a dull day as I can manage.

But for my children it's a different matter. Occasionally they condescend to use the educational programs I bought to convince my sceptical wife that computers are 'good for the kids'. But it's not long before they've given up and returned to the favourites – *Dan Dare* or *Chuckie Egg* – we can't afford more up-to-date games – and they get a great deal of fun from them, which I don't begrudge at all.

Sometimes, however, reading the adverts for new games, I get that sinking feeling in my gut. What's behind them all? Yes, they develop reflexes, ingenuity and stimulate imagination. But what about content? The mildest level is about dodging assorted nightmarish fates. Then there are exercises which exalt acquisitiveness and competitiveness, and then there are the outright exercises in aggression and warfare, either fantasy or reality simulated.

Recently there have been several games of geopolitical strategy, including those which give the player the role of dictator or superpower demi-god. Again, these games nurture fantasies of power without including any serious ethical content. Admittedly, there have been a few ecology games, but would a whole new category of simulation, strategy and adventure games, appealing to more responsible humanitarian instincts, prove entirely boring and unpopular?

How about something based around running a refugee camp in an unstable famine-ridden country? Object: not personal survival but keeping a community alive and giving it back its dignity. Or an adventure game that was based around rural development in India, or the creation of village industries from scratch against the opposition of local vested interests? These things require skill, imagination and endless persistence in the face of daunting difficulty – attributes much loved by computer fans.

There's as much information available to programmers on these subjects as there is about the handling characteristics of the F15 or a wartime submarine. They might just inspire games fans to channel energy into creative outlets in the real world instead of creating an inner world full of fantasies of acquisition and destruction.

The capacity for these things is part of us all, whether we admit it or not. But to dwell almost exclusively on these themes for fun – isn't this the electronic equivalent of bread and circuses, or the opiate of the people? If only my programming abilities matched my ideas . . .

Keith Kimber

PUZZLE

Puzzle No 260

The aliquot divisors of a number are all those whole numbers which divide into it exactly, including one but excluding the number itself. The aliquot divisors of six are three, two and one. In the case of six, if we add together the aliquot divisors we get the number itself. In this case six is called a 'perfect' number.

Some numbers, when treated in the same way, exist in pairs. For example, the aliquot divisors of 220 sum to 284, and the aliquot divisors of 284 sum to 220. Pairs such as this are known as 'amicable' pairs.

Other numbers form amicable chains of several intermediate numbers before returning to the starting point. One such is the five stage chain of 12496, 14288, 15472, 14536 and 14264. The aliquot divisors of this last number will sum to 12496, thus forming a chain of five repeating numbers.

Can you determine how many numbers are in the chain which has 83328 as one of its numbers?

Solution to Puzzle No 255

The two additions were: 482 + 157 = 639 and 614 + 358 = 972

Because of the error in the display the display was as follows:

Actual digit	1	2	3	4	5	6	7	8	9
Displayed as	4	3	8	1	5	7	6	2	9

The program uses a series of loops to generate each of the digits in turn. Each of the possible digits is tested in the nine variables R, S, T, U, V, W, X, Y and Z. From the two examples given, we can disregard the actual digits, and just take account of their relative positions. So we can replace the digits by letters as: RST + UVW = XYZ and XUR + YVS = ZWT.

The program uses these variables, generating other values where possible. The first of the additions is used as a basis of generating the variables, the second being used as a cross-check. For example, value Z can be calculated directly once we have T and W.

Winner of Puzzle 255

This week's winner is Andrew F Scott of Peterborough, who will receive £10.

```
100 FOR R=1 TO 9
110 FOR S=1 TO 9
120 IF R=S THEN 470
130 T=R+S:IF T>9 THEN T=T-10
140 IF T=0 OR T=R OR T=S THEN 470
150 FOR W=1 TO 9
160 IF W=R OR W=S OR W=T THEN 460
170 Z=T+W:IF Z>9 THEN Z=Z-10
180 IF Z=0 OR Z=R OR Z=S OR Z=T OR Z=W THEN 460
190 FOR V=1 TO 9
200 IF V=R OR V=S OR V=T OR V=W OR V=Z THEN 450
210 Q=(S*10+T)+(V*10+W):D$=STR$(Q)
220 IF LEN(D$)=3 THEN D$=MID$(D$,2)
230 Y=VAL(LEFT$(D$,1))
240 IF Y=0 OR Y=R OR Y=S OR Y=T OR Y=V OR Y=W OR
Y=Z THEN 450
250 FOR U=1 TO 9
260 IF U=R OR U=S OR U=T OR U=V OR U=W OR U=Y OR
U=Z THEN 440
270 Q=(R*100+S*10+T)+(U*100+V*10+W)
280 IF Q>987 THEN 440
290 D$=STR$(Q)
300 X=VAL(LEFT$(D$,1))
310 IF X=R OR X=S OR X=T OR X=U OR X=V OR X=W OR
X=Y OR X=Z THEN 440
320 IF X/2<>INT(X/2)THEN 440
330 Q=(X*100+U*10+R)+(Y*100+V*10+S)
340 IF Q>987 THEN 440
350 Q$=STR$(Q)
360 IF VAL(MID$(Q$,1,1))<>Z THEN 440
370 IF VAL(MID$(Q$,2,1))<>W THEN 440
380 IF VAL(MID$(Q$,3,1))<>T THEN 440
390 PRINT R;S;T;"+"   "X;U;R;"+"
400 PRINT U;V;W;"     "Y;V;S
410 PRINT"------      ------"
420 PRINT Z;Y;Z;"     "Z;W;T
430 PRINT
440 NEXT U
450 NEXT V
460 NEXT W
470 NEXT S
480 NEXT R
```

Rules

The closing date for Puzzle 260 is June 24.

HACKERS

VIP PROFESSIONAL

THE POWER OF LOTUS 1-2-3™ ON THE ATARI ST

ATARI ST SOFTWARE

'LOTUS PLUS GEM'

Probably the most impressive program to have been released so far for the Atari 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™. To give you the best program possible on your Atari ST, VIP Professional integrates the three essential applications of Lotus 1-2-3™ with the smart face of GEM. 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. Or, better still, you can use a mouse to make it even simpler! VIP requires only one disk drive to operate and also works with a hard disk drive. It is compatible with both monochrome and colour systems. Probably the most surprising feature of VIP Professional is not its total compatibility with Lotus 1-2-3™, nor its ease of use with the GEM environment, but its price. Lotus 1-2-3™ for the IBM PC AT costs £395 (+VAT=£454.25), whereas VIP Professional for the Atari ST range of computers is a mere £199 (+VAT=£228.85). That's nearly HALF PRICE!

INTEGRATED
SPREADSHEET
DATABASE
GRAPHICS
WITH
LOTUS 1-2-3
COMPATIBILITY

£199
(+VAT=£228.85)

1 SPREADSHEET

VIP Professional was modelled after the powerful, best selling Lotus 1-2-3™ program. It has every feature, every command of that program. In fact, the experienced 1-2-3™ user will feel right at home using the same keystrokes. But this version is made even easier to use by adding the user friendly face of GEM, so the beginner can use it right away. If you want to do your home budgets, financial planning, or sophisticated business inventory control or budget modelling, VIP Professional will fit the bill. And you can freely use 1-2-3™ or VIP Professional files created on other computers in VIP Professional on your Atari ST. And Professional is not only flexible, it's powerful too, with a full 8,192 row by 256 column worksheet to use with up to a massive 4Mb of memory. (Note: Lotus 1-2-3™ has only 2,048 rows).

2 DATABASE

VIP Professional includes a powerful data manager to arrange, store and analyse your important information. It can be used to store your home or business records and do extensive searches, sorts and comparisons. It allows up to 8192 records, with up to 256 fields and queries and 256 search criteria. The database manager can be used in conjunction with the spreadsheet commands to add greater power to the database facilities including sorting specific ranges of the database. You can also specify how you sort files, from the highest value to the lowest value (or from the lowest to the highest), or alphabetically (forwards or backwards). The graphics part of VIP Professional can be used to show trends in the database or other information. With its powerful statistical functions, it has almost limitless power.

3 GRAPHICS

VIP gives shape to your figures by letting you graph your data into six different types of graphs, in startling colour or black and white. Pie charts, bar graphs, stacked bar graphs, line graphs, scatter graphs and X/Y graphs. You can graph your spreadsheet or database data to give instant professional presentations. Your graphs will change instantly as you change the data. When creating a graph you may specify a main heading, a sub heading and a third title at the base of the graph. The necessary scales can be defined either by the user or automatically created. In pie graphs, the most important section of the pie can be separated from the other sections to draw attention to its importance. You may save graphs individually on disk for use at a later date. You can also print your graph on any Epson compatible dot matrix printer.

- Professional has 'Instant Help' so you can find more information instantly.
- calculates to a full 300 digits against Lotus 1-2-3™ which only calculates to 100.
- VIP allows for 256 Query Fields against only 32 allowed by Lotus 1-2-3™.
- VIP has a complete GEM interface, for ease of use, unlike the text of Lotus 1-2-3™.
- VIP allows different fonts and has an on/off cell grid. Not found in Lotus 1-2-3™.
- VIP supports greater memory and larger spreadsheets than Lotus 1-2-3™.
- VIP graphs and worksheet can be viewed together. Pie charts can be exploded.
- VIP can accept any .WKS files from Lotus 1-2-3™ without modification.
- VIP displays all spreadsheet information in user-sizeable GEM windows.
- VIP can be manipulated using either the keyboard or the user friendly mouse.
- VIP is currently available for the AMIGA, ST and APPLE IIc, IIe and IIGS.

OFFICIAL UK VERSION

The official UK version of VIP Professional has a pound (£) sign as a standard part of its character set. Other versions have also been imported unofficially from the USA and have a dollar ($) sign instead of a £ sign. These versions will not be supported by the UK distributors or their dealers. Ensure that the VIP you buy is the official UK version, not an unofficial import with incorrect characters.

VIP Professional is available from Atari ST Dealers throughout the UK. If your local dealer does not have VIP in stock, it can be obtained by mail order (P&P free) from:

SILICA SHOP Ltd, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX Tel: 01-309 1111

All comparisons made to Lotus 1-2-3™ are to version 1A. E&OE

INFORMATION REQUEST FORM

To: Silica Shop Ltd, Dept PCWK 0587, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

Please send me further details of VIP Professional for the ST

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

Address: .....

.....

.....

.....

..... *Postcode:* .....

I am interested in the Atari ST ..... ☐

I already own an Atari ST ..... ☐