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POPULAR Computing WEEKLY

8–14 January 1987 Vol 6 No 2

Atari's new 520ST with built-in drive

Full review on page 15

FEATURES

Graphics on the PCW8256 with Mirrorsoft's GOS programming utility see page 18

Marconi's trackball – the screen control alternative to joysticks and mice?

Full Spectrum 128 and Plus 2 disassembler for you to type in

THIS WEEK'S REVIEWS

Strike Force Harrier comes alive on the ST

Mapping through Explorer from Electric Dreams

NEWS DESK

Mastertronic takes on Gallup in war of words

Robert Maxwell extends software empire

SAS

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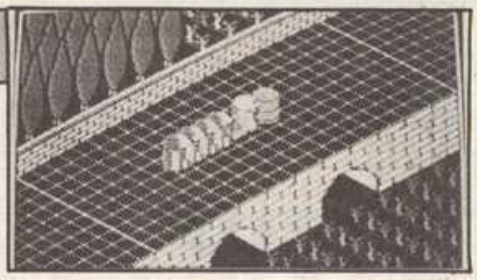

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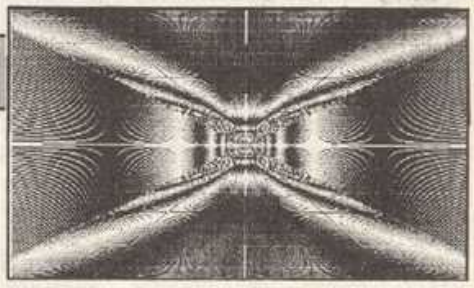

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ABC

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Mastertronic attacks accuracy of charts

MASTERTRONIC is renewing its attacks on the accuracy of the Gallup software charts, and may be contemplating legal action over them. "According to Gallup we had 10·5 per cent of the market in the first week in December," says Geoff Heath of Mastertronic. "But we had at least double the market share Gallup credits us with."

Heath says Mastertronic sold 300,000 games in that week, 200,000 of these in the UK, and says if that's 10·5 per cent of the market the British software industry must have been selling two million games a week in the run-up to Christmas. In that case "Mastertronic is delighted to be part of such a large industry."

Heath: "Delighted"

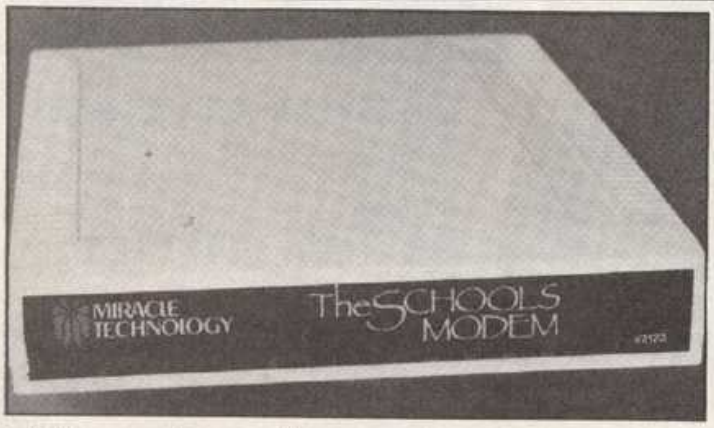
Mastertronic feels the market is a lot smaller than that, and its own share a lot higher, "at least double the share Gallup credits us with," says Heath. He estimates that a total of 300–400,000 games are sold each week throughout the year, and even doubling or trebling this for the Christmas boom leaves the total well short of two million units a week.

Heath puts the discrepancy down to the relatively narrow range of retail outlets polled by Gallup. "The chart only takes in Smiths and Menzies, while major outlets for us are Woolworths, Boots and Toys R Us. You just get to the point of saying the whole chart is inaccurate."

Currently Mastertronic is directing its efforts at publicising what it sees as the inaccuracy of the Gallup charts, but industry sources suggest that the company is on the point of serving Gallup with a writ for damages. Mastertronic won't categorically deny this, but refuses to comment on the matter. "At this stage it's something we're not prepared to talk about," says Heath.

Mastertronic intends to launch its first PC and ST products at this month's CES show in the States. "They're superb products being developed in the States," says Heath, although he refuses to pre-empt the launch by saying what kind of products they are. They will, however, be launched at under £10 here.

Godfrey Rust of Gallup concedes that Mastertronic's market share is undervalued and says this is being tackled in part by attempts to bring more retailers into the chart. "But the charts are there to measure what's happening in the high streets, so Mastertronic's sales will never be fully represented."



Miracle wins modems for schools contract

MIRACLE Technology has won a £250,000 contract to supply modems to schools. The company's Schools Modem supports 300 to 1200 baud including Prestel standards, and according to Miracle marketing manager David Baxter has been "tailored precisely to the real needs of schools."

The modem uses Hayes protocols and can be upgraded to V22 and V22bis 2400 baud full duplex. It sells together with communications software for £199.95.

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

King in Wales

SPEED King joystick manufacturer has won the New Enterprise Award in the 1986 Welsh National Business Awards. The award was presented in December, just 18 months after Konix was formed, and is the first of the awards to be won by a home computer company.

Brother builds a bigger buffer

PRINTER manufacturer Brother launches what promises to be the ultimate in printer buffers this month. The device, which Brother describes as a data synthesiser, is a super intelligent buffer which incorporates one or two 3 ½ inch disc drives and Ram up to 1148K.

It can be programmed to perform a variety of specialised tasks, for example the merging of graphics and text, organisation of in-house electronic mail, printer code translation or teletext conversion. Similarly as it has a considerable amount of power on board it could be used alongside a terminal to run as a CP/M computer in its own right.

This facility could be useful for some specialist tasks, as it means data can not only be stored in the buffer but can also be manipulated.

The machine comes with a Centronics interface as standard, and has the option of using an RS232 as well. Brother will initially sell it through the OEM market.

Ram upgrades for Apples

CIRTECH has launched a £99 256K Ramcard, upgradeable to 1Mb, for the Apple II and IIGS micros. Plusram is automatically recognised as a high capacity disc drive by Prodos, CP/M Plus and Pascal 1.3 and comes with support for Dos 3.3, CP/M 2.20b/2.23 and Pascal 1.1/1.2.

The card is compatible with all standard Apple II programs and will plug into any standard expansion slot.

Details from Cirtech, Currie Road Industrial Estate, Galashiels, Selkirkshire TD1 2BP (0896 57790, or BT Gold 84:CPD001).

Modem House baud of inquiry

MODEM House has announced an on-line support service for users of its Comm Plus communications software. The service runs on a 24 hours a day, seven days a week bulletin board on 01-833 1450, and includes job control files with source codes (allowing them to be customised) and a front end for the Easylink electronic mail service.

The system also includes downloadable bulletin board software, making it possible for users to set up their own boards.

Details from Modem House, 70 Longbrook Street, Exeter, Devon EX4 6AP (0392 213355).

Price of CAD software packages cut to bone

THE cost of computer aided design dropped below £100 this week with the launch of Robotechnic's *Generic CADD* 2,0 at £99 – CAD packages can often cost as much as £1,000.

Generic CADD was first announced in the States last June, and according to Robotechnic had sold 20,000 by October. The product runs on the IBM PC and compatibles, and is claimed to offer similar facilities to *Autocad* at a fraction of the price.

A family of add-on tools is also to be launched for *Generic CADD*, the first two being *Autoconvert*, which allows files to be swapped with *Autocad*, and *DotPlot*, which allows a dot matrix printer to emulate a plotter. These are £25 each.

Correction

Attention ST users – the phone number supplied to us for the London ST Bulletin Board (*Popular Computing Weekly*, Vol 6 No 1, Page 11) was incorrect. The number to ring is, in fact, 01-443 2432. The London ST User Group extends its cooperate apologies to all concerned.

Light dawns for the Amstrad PC1512

SOFTWARE Marketing has produced the Electric Studio light pen for the Amstrad PC1512. The pen uses mouse protocols, so should work with all programs that use the mouse, and will run under Gem, Dos Plus or MSDOS.

It's likely to be particularly useful for producing freehand pictures with the likes of *Gem Paint* and *Gem Draw*. It costs £19.95.

Details from Software Marketing, PO Box 14, Letchworth Garden City, Herts SG7 6TZ (0462 834248).

More Dexterity from Infogrames

GET Dexter should be out on the Spectrum, Commodore 64 and Atari ST soon, thanks to a UK distribution agreement recently signed between Infogrames and French software house Ere Informatique.

Ere normally develops on the Amstrad, but as part of the deal Infogrames gets the right to convert titles to other machines. According to David Crosweller, the ST version of *Get Dexter* will have "greatly enhanced facilities"

Software Hotlines

Well, the season of peace, goodwill and massive overconsumption is well and truly over now. And you think you had it tough?

The computer industry started the gluttony off a full week and a half before Christmastide at the 'In-Din' charity dinner.

This is one of the few occasions when the whole of the software industry, producers, distributors and magazine publishers get together in one room and pretend to like each other.

Until the critical level of alcohol consumption is reached that is (a little known mathematical function known as Cook's Constant).

This critical point was reached half way through the awards and went right off the scale during the charity auction, causing man of the hour Nick Alexander of **Virgin Games,** to leave in disgust. The good news is that around £20,000 was raised for the NSPCC, which is also to be the recipient of the revenue of this year's charity compilation tape.

Congrats to Rod Cousens et al at **Electric Dreams** for organising that.

It's touching that idealism still hides away in the odd shady nook and cranny of the biz.

Take those nice people **Logotron** – who specialise in BBC educational stuff. They are just about to release a game (called *XOR*) in a very strange way.

Punters will not be able to buy it in the shops, but will have to avail themselves of a copy of a future edition of A&B Computing, which will contain a floppy disc containing said game, free.

The thing is, without the super special code (only obtainable from **Logotron,** priced at a very reasonable £9.95) you can only boot it up three times, and get into five of the 15 levels.

Any deal where you walk away with a disc for nowt has got to be a winner – only I get the feeling that some clever individual is going to crack the super secret protection fairly pronto, leaving **Logotron** a little out of pocket. Not to mention the state the discs are going to be in after going through the rigours of magazine distribution.

Finally, this week saw an increase in a disturbing trend in games software. The 'it sounds good, it looks good, but is in fact as much use as a small plate of dried herring' syndrome.

Almost certainly a side effect of the way the big multiples are selecting the games they wish to stock at the moment – it's really starting to annoy me. You too, if you have any sense. Take *Infodroids*. Fantastic music, great graphics, but the game is dreadful.

Now *Knucklebusters* from **Melbourne House,** showing exactly the same symptoms. Come on lads . . . play the game.

John Cook

Infodroids

DIARY DATES

JANUARY

9–11 January
6th Official Amstrad Computer Show
Novotel, Hammersmith, London W6
Details: The year kicks off with the first of an ever increasing wave of Amstrad shows. Hardware, software, the works for CPCs and PCWs, with early support for the PC to be expected
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

FEBRUARY

17–20 February
Which Computer? Show
NEC, Birmingham
Details: Mainly business exhibitors
Price: £5
Organiser: Cahners Exhibitions, 01-891 5051

26–28 February
The Atari Computer Show
Novotel, London W6
Details: First chance for Atari to show off exciting new strategy
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

APRIL

10–12 April
The Commodore Computer Show
Novotel, London W6
Details: Software, hardware and peripherals for Commodore range of machines
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

MAY

9–10 May
The Electron & BBC Micro User Show
New Horticultural Hall, London
Details: Software, hardware and peripherals for Acorn's micros
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

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.

Gold denies bug but changes C64 Gauntlet

US GOLD has modified the 64 version of its *Gauntlet* hit, but denies suggestions that the game suffers from bugs. One of the major reported problems with the game is that when one of the characters moves off the screen it becomes impossible either to move the character back or to move the other character.

According to a US Gold spokesman this is not, however, a bug, as the character can move back provided it retraces its steps exactly. "It's something that was in the coin-op versions, but it's being taken out of the ones we're duplicating now." In the earlier versions failing to retrace your steps correctly means you're forced to reload the game.

He also says that Gold is unaware of any other problems with the game. *Popular* play-tests have, however, identified various others that, while not rendering the game unplayable, are irritating. These include magic potions that go off of their own accord and the occasional quirk with the dying routine.

Gauntlet: **Bugs denied**

Maxwell's empire moves into US software market

ROBERT Maxwell's Pergamon Group has increased its involvement in the software industry by purchasing US companies Spectrum Holobyte and Nexa. Pergamon already owns Mirrorsoft and software distributor Microdealer, and has recently been involved in CD Rom technology through its Pergamon-Infoline subsidiary.

Spectrum Holobyte is known for its 16-bit products, which include the games *Gato* and *Orbiter*, while Nexa is a third party development house which, according to Mirrorsoft managing director Jim Mackonnockie, "has produced products for most of the majors in the US."

The two are to be merged into a new company, Sphere, which is to cover the US and Canadian markets for Pergamon, and which is to be part of a strategic policy to establish the group as a worldwide force in the software industry. Sphere will develop 8-bit and 16-bit software in the consumer and business markets, and is likely to engage in cross-licensing deals with Mirrorsoft and other companies within the group.

Footnotes

WHAT Christmas present has been generating fear and loathing throughout Britain's software industry? What is it about the sound of silver bells that makes them shout 'lepers' and go and fetch the silver bullets? Could it be a product so hot it's radioactive?

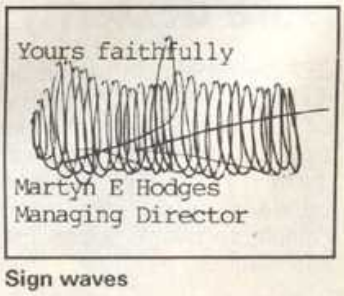
The problem is that Nirex, an organisation not unassociated with the disposal of nuclear waste, wants someone to write a computer game. Unfortunately, as the game is supposed to emphasise the positive, safety aspects of the nuclear industry – *Android 1* won't do – the great and good of the software industry are understandably afeared of appalling publicity.

Which is why people are starting to associate white Christmas with nuclear winter . . .

Just back from a five year mission to the planet Mong is Sharp Electronics, which has extended its PC 7000 series of PC compatibles. "The PC-7500 series is . . . extremely competitively priced," says national systems manager Tony Fall. The PC 7511 AT compatible is a snip at £3,474, while an Olivetti M28 can be had for £2,824 and AT compatibles from obscure manufacturers can be had for £2,000 or less. Sharp appears to have joined the group of manufacturers having difficulty relating to post-Amstrad prices . . .

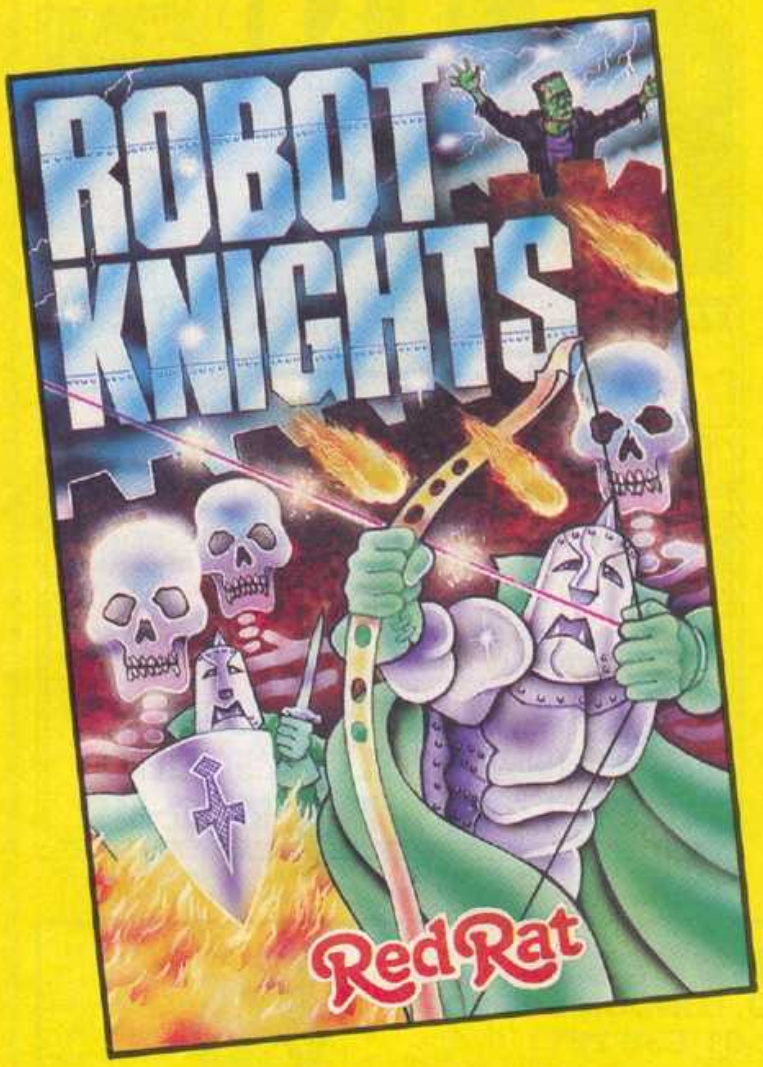
As you can see from his signature, Martyn E Hodges, managing director of Software Marketing, is a bit of a . . . unique person. A bad case of the shakes, or did he just get a Spirograph for Christmas?

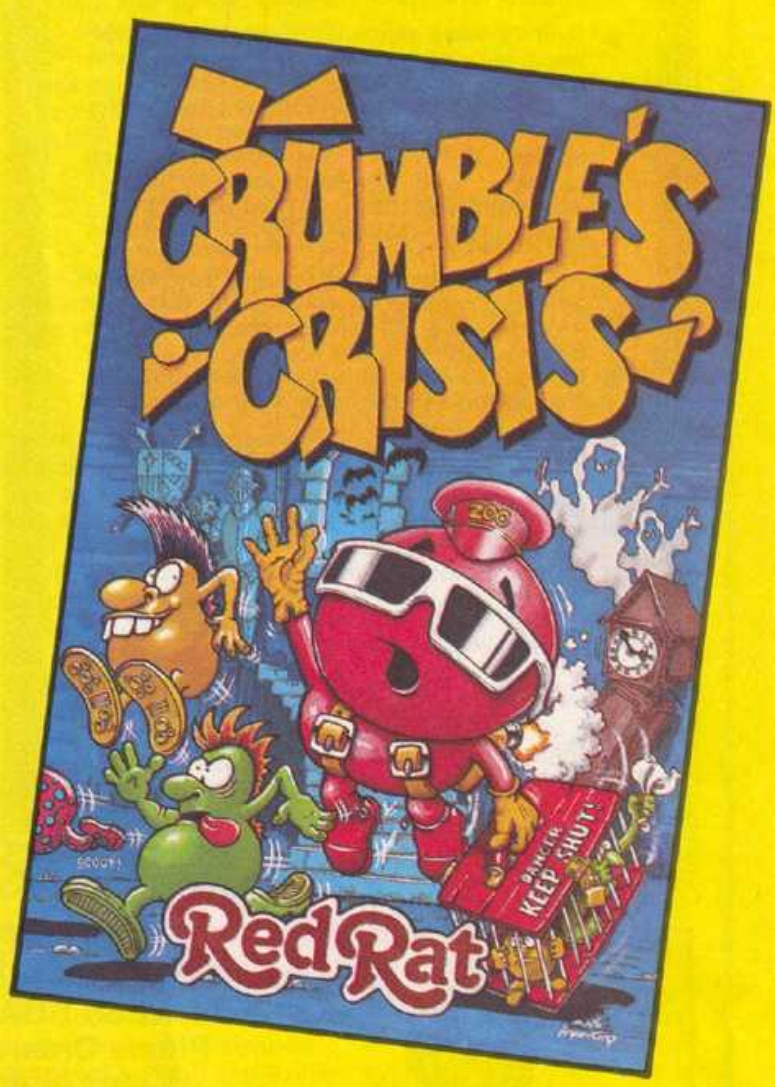
P&P has meanwhile hit on 'defenestration' as a way to sell Microsoft *Windows*. "A regular everyday occurrence? Not exactly," says P&P. Defenestration is the act of throwing people out of windows, so Microsoft *Windows* is being sold on the basis that it's good at throwing information out of windows. The most common use of 'defenestration' is, however, in the context of the Defenestrations of Prague, which were directly responsible for the 30 Years War and the ensuing devastation of central Europe. It's doubtful that this is what Microsoft has in mind for its product . . .



Sign waves

THERE'S A RAT IN ATARI...





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(**DUMPY** is produced by Bradway Software)

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SMASH HITS 6 (DISC)	£11.95
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MISCELLANEOUS	
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NB All the above Special Offers INCLUDE P&P in U.K.

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VISA

What price for quality?

Very shortly I'll be moving up the technology ladder and trading in my ever-popular Memotech for the new Atari 520 STFM.

I'm very impressed with the software for the machine, but as with the earlier Ataris, the price is expensive.

"The object of the game is to keep shooting the pollsters until your market share doubles"

A piece of games software (not too different to some C64 stuff) is being sold for between £19 and £50.

All right, the spec of the machine is high and sales (as yet) are low, but surely software at a lower price would promote sales in the machine, thus making a market for more software in the future?

I'll be using the ST for programming and zapping, and I don't want to pay hundreds of pounds for what, on the whole, is plain software.

Is Mastertronic listening?

Philip Arkley
Accrington, Lancs

We understand that Mastertronic, among others, will be launching budget ST software (see this weeks' News Desk). In the meantime, £15–£20 sounds about right, given the extra development costs and the price of 3½in discs.

ST: too good to succeed

Thanks for your comment on my letter about a gap in the market for a 68000 machine. I agree that the Atari ST is the nearest thing yet (I'd love one).

But it's been out a long time now, and has not become a common home computer, has it? Which is the point I was making; it's too expensive for popular appeal.

The ST is cheap for what you get, but it has massive amounts of Rom containing a highly complex operating system. This sort of thing is OK if you have a business machine but I question its usefulness in the home/hobby market.

Second, a keyboard of 85 keys is over the top. Third, the decision to drop the 256K model was a mistake.

What I'm saying is that the ST is a little too highly specified. If something simpler and cheaper, but with the same 68000 power was available, it would have a clean sweep and the snowball effect of hardware and software sales could begin. At the moment the ST is creeping into a few homes only by default.

If you're going to carry on disagreeing with me, let's hear your reasons.

I can see one light at the end of the tunnel. I'm praying that Sir Clive's wafer memories and (later) Acorn's RISC technology will bring progress in price/performance.

Peter Erskine
Wivenhoe
Essex

Atari has sold tens of thousands of STs in the UK, and I'd guess that all but a handful have been sold as home computers. As for being overspecified, the operating system and size of keyboard are negligible in terms of cost. Any 68000 system worth having must include a disc drive and at least 256K of memory – difficult to see how anyone's going to do this at the sub-£200 price you're looking for.

Well served

After some complaints about bad service from some computer companies, I must write about the excellent service I got from Technology Research.

Three weeks before Christmas I ordered a disc interface for the Spectrum Plus 2. It was faulty, so I sent it back. Only four days later I got it back fully working.

I think service like this should be highlighted, and I would recommend TR to anyone.

Mike Gooch
Bungay, Suffolk

Spectrum text improvements

Congratulations to Derek Paterson on his versatile Text Editor program (*Popular*, December 18). It's so concise I spent longer looking for extra pages of listing than typing it in.

A couple of gripes, though. First, saving the text as bytes from its calculated start address (variable "ad") is very dicey. I'd suggest replacing the *Code ad* with *Data W$()* in lines 920 and 940 – safer, if less efficient.

Second, the text could do with a flashing cursor to show where you're typing. This can be achieved as follows. Add a new line:

```
5 clear 65499: DATA 33,0,88,1,0,3,
203,190,15,11,120,177,32,-8,33,
0,88,17,32,0,6,0,4,237,90,16,-4,
237,82,30,0,237,90,203,254,201:
FOR E=65500 TO 65535: READ F:
POKE E,F: NEXT
```

In line 10, replace 1200 with 1150; in line 60, erase everything after the 4th quote mark. At the start of line 100, insert *Poke 65521,X-1: Poke 65530,Y-1: Randomise USR 65500:*

Amend lines 920 and 940 as above.

Dave Marriott
Nottingham

Puzzle No 240

%@ High Street Newtown

"I am writing to complain about the word processor that you supplied to us on the */th of September. As you can see, the numerals have gone completely haywire, printing out various punctuation marks instead of the digits. All ten digits (zero to nine) are affected, each printing out its own symbol.

As we rely on numerals quite a bit, you will realise that this results in some inconvenience. Even typing out a simple sum can have quite alarming results. For example + plus + equals = is one instance (the + and the = are, of course, digits). Similarly, I get the multiplication @£% times &%! equals !@@&@.

I would be grateful if you can rectify this problem as soon as possible. Please phone me to arrange this. My number is @%* &£=/ and I am in the office at +.)) most afternoons.

Yours faithfully, F Smith

PS Can you work out the symbol for each of the ten digits?"

Solution to Puzzle No 235

Answer: a) At the end of the first year he will have received £6 9s 7d. b) The total bequest amounts to £11.08p. c) Algernon will have received half his total bequest by May 22, 1900.

Solution: The program works by calculating the entire daily calendar for the period 1/1/1900 to 31/12/1999. Starting on the first day with a sum of £1, this amount is incremented each day by the sum of the series 1/2 + 1/3 + 1/4 + . . .

There are two minor 'traps' to the question. Part a) requires the answer to the nearest penny (which in 1900 would be an *old* penny), and also it should be borne in mind that the year 1900 was *not* a leap year and so there were only 28 days in February. (A year is 'leap' if it is divisible by four – but excepting the 'century' years unless they are also 'millenium' years such as the year 2000).

```
10 T=0:R=1
20 FOR YEAR=1900 TO 1999
30 FOR MONTH=1 TO 12
40 D=31
50 IF MONTH=4 OR MONTH=6 OR MONTH=9 OR
MONTH=11 THEN D=30
60 IF MONTH=2 THEN D=28
70 IF YEAR/4=INT(YEAR/4) AND YEAR>1900
THEN D=29
80 FOR DAY=1 TO D
90 T=T+1/R:R=R+1
100 PRINTDAY;":";MONTH;":";YEAR;"  ";T
110 NEXT:NEXT:NEXT
```

Winner of Puzzle No 235

This week's winner is A J MacDonald of Rochford in Essex, who will be receiving £10.

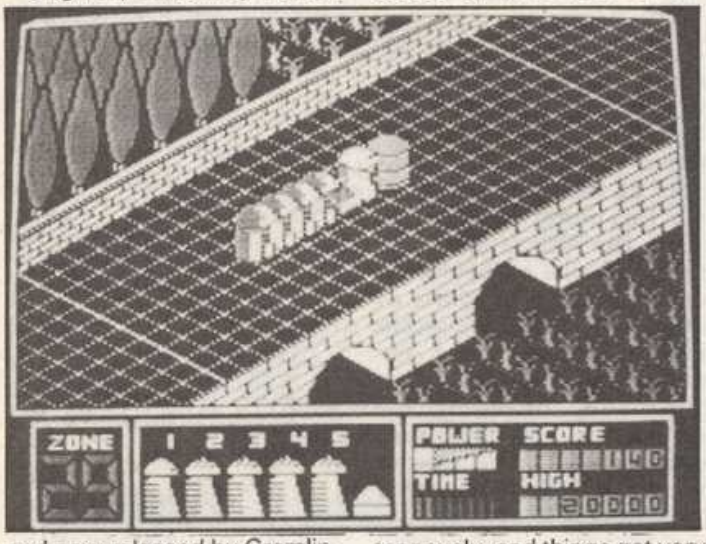
Rules

The closing date for Puzzle 240 is January 31. Printouts or written listings of programs used to solve the puzzle should be included with your entry.

On the road with Highway Encounter

Something of a circuit-sizzler when first released on the Spectrum, *Highway Encounter* loses nothing of its originality on the 64, although the hard edge of the graphics seems to have gone missing.

Originally written by Vortex and now released by Gremlin, *Highway Encounter* is one of the very few completely original game concepts of recent times. You control a robotic Vorton which moves diagonally along an alien-infested highway. It's your task to clear the obstacles which prevent your fellow Vortons from following you along the road.



Your ultimate task is to get the Vortons' weapon, the Lasertron, through to the last stage and demolish the aliens' mothership. There are 30 segments of highway to get through, each one more fiendish than the last.

Nice theme music, decent colours and fair animation are marred only by some horrific sprite problems; five Vortons, a Lasertron, three or four eyeballs and some obstacles on the screen simultaneously, and things get very messy indeed, with bits of Vorton flying around loose and things flickering on and off like demented traffic lights. Otherwise – check it out.

Popular Appeal ♦♦♦

Chris Jenkins

Program *Highway Encounter* **Micro** CBM 64 **Price** £8.95 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS.

Bomb Jack is back

It goes without saying really, that *Bomb Jack 2* is the sequel to the successful *Bomb Jack*.

As before, the game presents your little leaping hero with a series of platforms inhabited by fierce enemies. The trick is to leap around the platforms collecting treasure and special bonuses without getting splattered; but in this case, you can fight your enemies with your little sword.

There are 40 levels of this, but although the baddies become more fierce as the game goes on, with armoured flying knights replacing the initial lizards, I didn't find that the game became more interesting. The Amstrad and Commodore versions are fairly similar apart from the zippier Commodore music. Only recommended for the very persistent.

Popular Appeal ♦♦

Chris Jenkins

Program *Bomb Jack 2* **Micro** Amstrad CPC/C 64 **Price** £8.95/9.95 **Supplier** Elite, Anchor House, Anchor Road, Aldridge, Walsall SW9 8PW.

Anyone for a

Flight simulations have covered an enormous amount of ground considering that the basic concept is pretty limited. From air traffic control, to aircraft carriers, to helicopters, to jet combat scenarios, with all sorts of combinations in between, the struggle has always been to reconcile realism with reasonable ease of use. Let's face it, anything which is totally realistic would be almost impossible to play, and would hurt when you crashed.

Mirrorsoft's *Strike Force Harrier* on the ST is, however, one of the more realistic simulations with around 20 controls to master in addition to the joystick and mouse, and the control panel is dominated by a perspective radar display which, if it were accurate, Marconi would give their eye teeth to have installed in real Harriers.

The aim of the game is to use the abilities of the Harrier – there are three versions in service, and this simulation combines the facilities of all three – to destroy an enemy base 125 miles from your headquarters. To help you in your task you are equipped with FOFTRAC, a futuristic target identifying radar, plus missiles, bombs and cannon. To ward off attacks from radar-guided missiles you can also deploy chaff, or infra-red flares.

Mastering the intricacies of vector thrust is one of the most interesting aspects of

When in Rome . . .

Oddly enough, computerised sea warfare simulations are few and far between. Lothlorien's entertaining *Legions of Death* does, however, seem to be a step in the right direction.

The game is set in the First Punic War, when the Romans and Carthaginians slugged it out for supremacy in the Mediterranean. The 'game board' is the area of the Med that takes in Italy, North Africa, Sardinia, Corsica and Sicily, and your goal is to fulfil victory conditions: number of ports captured, ships sunk and gold amassed.

The game's scale is something of a fudge, with the ships being a lot larger (and fewer in number) than would actually have been the case. You therefore find yourself fighting relatively small-scale actions over quite large areas. If, however, you view the strategic picture as simply a framework within which you can fight tactical actions, this shouldn't trouble you too much.

The game can be played against the computer, or two players can play each other, the mechanism being basically to use an icon-driven menu system to run gold back to your capital, use the gold to build various ships, then use the ships to get more gold and/or hammer the enemy. Sea combat seems fairly accurate in that you need to put a lot of thought into manoeuvring your vessels, and you also need to judge whether to ram or board carefully.

There are, however, a couple of disappointments. It doesn't seem to be possible for the computer to judge which way ships are going (or if it is, it doesn't do it well enough) so ship types are simply compared when they collide, and the smaller takes more damage, even if it should have got the larger in the side.

The differences between ramming and boarding, or seamanship and fighting, are also inadequately drawn. Full marks to Lothlorien for putting in the corvus (a sort of drawbridge the Romans used in boarding actions) but black marks for allowing the Carthaginians to use them, too.

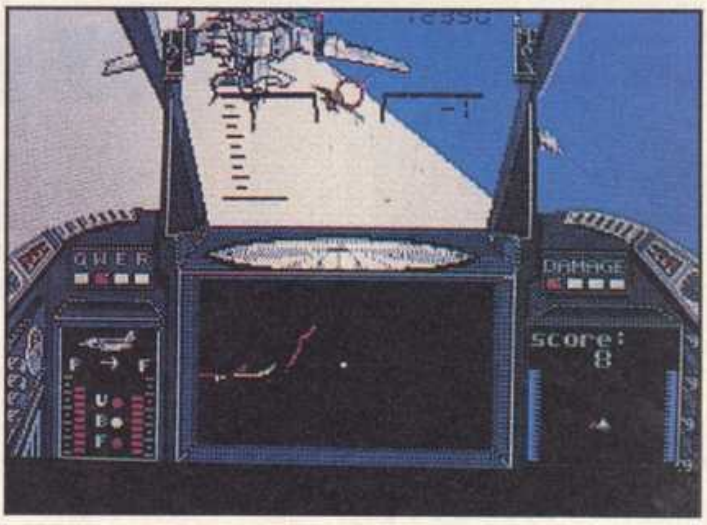
Still it's nice to meet a game good enough to warrant criticism on historical grounds, and I'm sure I'll be playing it for some considerable time.

Popular Appeal ♦♦♦♦

John Lettice

Program *Legions of Death* **Micro** Commodore 64 **Price** £9.95 **Supplier** Lothlorien, Victory House, 14 Leicester Place, London.

dog fight?



the game. The Harrier's variable thrust is reduced here to three possibilities, forward, 45 degrees and vertical; however, it's enough to add an extra spark to the combat sequences, where VIFFing (changing the thrust vector in mid-flight) gives you an advantage over the boring old conventional MiGs.

The HUD (Head Up Display) relieves you of the necessity of keeping your eyes on several instruments showing speed, altitude and orientation. It's all there projected on the cockpit canopy, so you don't have to take your eyes off your targets. Your two radar displays give plenty of warning of any attacks or good targets. The Air Attack Radar to the right of the screen shows surface-to-air and air-to-air missiles and enemy aircraft, while FOF-TRAC, the Friend Or Foe Tracking Radar, shows land features such as mountains, missiles sites, moving tanks, and a track showing your own course.

In order to finish your mission you must refuel and rearm at one of the prepared landing bases. Although vertical landing sounds easier than a conventional strip landing, it's easy to get in a spin and find yourself splattered all over the concrete. Forgetting to lower your undercarriage and flaps doesn't help.

If you land safely on an unprepared site you can signal your ground forces to move up to refuel and rearm your fighter, although to clear the way you will have to destroy enemy surface installations with bombs and cannon first.

Most exciting are the air-to-air combat sequences which take place above 10,000 feet. The enemy fighters are the most realistic graphics in the program (which include yellow pyramid-shaped mountains in the ground section. *Egypt Attack,* anyone?).

But details like blacking out . . . redding out or bluing out, depending on the direction of pull, actually – or stalling disconcertingly in the middle of an Immelmann Turn show that *Strike Force* is a classy piece of programming.

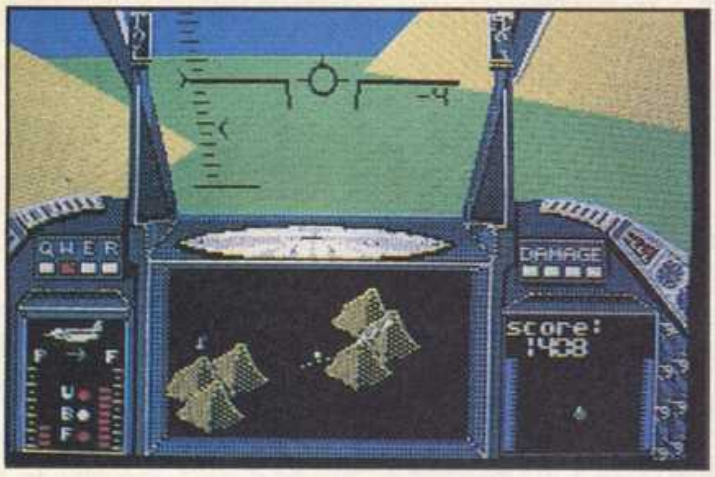
Add the smoothness of the animation and the wealth of graphic detail and you can only draw one conclusion about *Strike Force Harrier.*

Your ST would sulk without it.

Popular Appeal ♦♦♦♦

Chris Jenkins

Program *Strike Force Harrier* **Micro** Atari 520/1040 **Price** £19.95 **Supplier** Mirrorsoft, Maxwell House, Worship Street, London EC1.



From zapping to mapping

The Ram Jam Corporation has a penchant for putting tortuous game ideas into practice – with *Explorer,* the team may have overreached itself.

Explorer is possibly the ultimate in 'mapping' games – an orienteering enthusiast's dream. Ram Jam swears blind that the game has 40 billion mappable locations and we're probably all going to have to take this as read.

Of course, there's more to the game than just wandering around admiring the scenery; there are the ubiquitous objects to collect. Consider, though, that you are searching for a mere nine fragments of crashed space craft among 40 billion locations.

Luckily the scenery is rather good, with some very pretty high resolution graphics, animated waterfalls and authentic native villages. David Attenborough is almost certainly lurking in one of those locations somewhere.

You move around by setting a compass bearing and plunging forward into the jungle to see what lies ahead. There are a number of devices within the game to help you find your way around. You can send out a sounding to discover where the nearest object is to visit. You can also go inside one of the multicoloured beacon things, and think of any name for a destination, whereupon you will be beamed to it forthwith. You can then be transported back to the same spot at any time so long as you can remember what you called it.

Explorer really does defy categorisation. It's not an adventure, it's certainly not an arcade game, and it's too surreal to be a strategy game. It's probably quite addictive if you persevere enough to get into it. But I suspect you'll have to be pretty diligent.

Popular Appeal ♦♦♦

Christina Erskine

Program *Explorer* **Micro** Spectrum / Amstrad/ Commodore **Price** £9.95 **Supplier** Electric Dreams, 31 Carlton Crescent, Southampton SO1 2EW

Driven mad by Icon Jon

Tony Kendle has been distracted from zapping recently by the attractions of Trivial Pursuit . . . but the prospect of tips for Mirrorsoft's Icon Jon brought him back to the joystick

I owe an apology to Domark and everyone to do with the computer version of *Trivial Pursuit*. I freely admit that I expected the game to be dreadful and I even more freely admit that I was completely wrong – the game has featured high on Christmas shopping lists, including mine, and I now have to eat my words, which fortunately I did not put into print at the time.

Firstly I was worried about the idea of a little animated man running around, but congratulations to Domark because it has been well done. It really does improve the enjoyment of the game when you're playing in a party atmosphere, and most importantly it hasn't used up so much memory that there is only room for a pathetic handful of questions left over.

My biggest worry, however, was due to the fact that it is incredibly difficult to implement any sort of quiz game on a computer. The problem comes when you try and anticipate all of the possible replies and vagaries of spelling that people may type in. It's an infinitely harder task than that presented to the writers of adventure games who are able to rely on a relatively simply structured reply based on the 'verb – noun' system.

Domark was particularly ingenious when it designed *Trivial Pursuit* – they completely side-stepped this problem by leaving it up to the human players to decide whether the answer given was correct or not which is, of course, the way the game is played when we use cards instead of computers.

And now for something completely different. Mirrorsoft's new game *Icon Jon*, a game in the tradition of the Wally Week series, has been driving me mad over the last few weeks and I was very grateful when the company took pity on me and provided some cheats and tips for the game. For those who are in as much of a muddle as I was with it here is a little help.

First there are some essential objects that you need to collect. Pick up the brush – the service routine. Pick up the screwdriver – the protection routine. Pick up the record in the Scratched Platty Shop (I thought this was based inside a computer!).

Now you have to get through the maze (shall I tell how? . . no, you can work this out for yourselves). Insert the record in the slot in the dole office (it's a UB40 record – geddit?).

Press button four in the lift control room to summon the lift. Use the brush in the joystick to clean the connections. Pick up the jar. Use the screwdriver in the curly cable to make a connection.

Now go past the keyboard to get the joystick input port and take the telephone which appears. Use the telephone in the Rom select room and press button one to select a modem. Go back through the maze to get into the Rom.

Now pick up the identity card in the telephone booth. This should be used in the slot in the instruction store to enter the new room. I'll leave it here for now as that should get you started. There will be more help in later weeks.

Finally, this week, a cheating treat from the Happy Hackers for *Alien Highway* players (below). Good luck!

```
1  ' ************************************
2  ' *    THE HAPPY HACKERS PRESENT     *
3  ' *       ALIEN HIGHWAY CHEAT        *
4  ' *   SORRY BUT THIS IS DISC ONLY     *
5  ' ************************************
6  '
7  '
8 MODE 1:BORDER 0
" CHR$(7)
10 CHECK=0
11 FOR ADDR=&C000 TO &C05B
12 READ A$:BYTE=VAL("&"+A$)
13 POKE ADDR,BYTE:CHECK=CHECK+BYTE:NEXT ADDR
14 IF CHECK<> 8089 THEN PRINT "WRONG WRONG
   WRONG: ERROR IN DATA!":STOP
15 IF INKEY$="" THEN GOTO 15
16 CALL &C000
17 REM
18 DATA 21,59,C0,CD,D4,BC,22,59,C0,21,00,03,E5,11,00,14
19 DATA 3E,09,01,22,09,F5,E5,DF,59,C0,E1,F1,0C,24,24,10
20 DATA F4,14,3D,20,ED,E1,01,00,9A,3E,BA,AE,77,23,0B,7B
21 DATA B1,20,F6,01,7E,FA,ED,79,21,3E,07,22,3B,1B,21,32
22 DATA 17,22,3D,1B,21,00,C9,22,3F,1B,21,00,03,11,00,00
23 DATA 01,00,9A,F3,ED,B0,C3,0E,03,B4,00,07
```

Charts

Top Twenty

1	(1)	Gauntlet	**US Gold**
2	(3)	Computer Hits Vol 3	**Beau Jolly**
3	(4)	Trivial Pursuit	**Domark**
4	(7)	Space Harrier	**Elite**
5	(2)	Paperboy	**Elite**
6	(11)	Hit Pack	**Elite**
7	(6)	Konami's Coin-op Hits	**Imagine**
8	(8)	Five Star Games	**Beau Jolly**
9	(15)	Ollie and Lisa	**Firebird**
10	(10)	Cobra	**Ocean**
11	(9)	180	**Mastertronic**
12	(13)	Scooby Doo	**Elite**
13	(12)	Super Soccer	**Imagine**
14	(5)	Footballer of the Year	**Gremlin Graphics**
15	(16)	BMX Simulator	**Code Masters**
16	(18)	The Great Escape	**Ocean**
17	(–)	Infiltrator	**Mindscape/US Gold**
18	(–)	Head Coach	**Addictive Games**
19	(14)	Breakthrough	**Data-East/US Gold**
20	(–)	Ninja Master	**Firebird**

All figures compiled by Gallup/Microscope

1986 – the year of DIY adventuring

Tony Bridge looks back at '86 – and comes to the conclusion – there's no place like home!

1986 was not a vintage year for adventures; there was much conversion, consolidation and compilation, but little origination. Understandably, the major software houses see their greatest sales as lying with arcade games; if adventure is mentioned, it is usually in conjunction with 'arcade' or 'graphic'.

I was glad to see *The Pawn* get a wider audience – although I still believe that it lacks the 'completeness' that Infocom manage in its programs. It is, nevertheless, one of the best attempts that we'll see. It's about time, too, that Magnetic Scrolls gave us an Amstrad version – the Amstrad discs would be very handy for this adventure.

Level 9 has been marking time, I feel, although the compilation of the *Middle Earth* and *Silicon Dream* trilogies were both very welcome. Rainbird has done a great packaging job on both of them, and they should hold pride of place in anyone's collection. Level 9 seems to have become a little bogged down in marketing, but let's hope that the company will spend its time in 1987 getting on with writing first-class adventures.

1986 has seen adventure clubs and fanzines take a stronger hold. Some have fallen by the wayside, and those that are left have probably realised by now that hard work is needed as well as enthusiasm.

Reading those magazines that come my way are a highlight for me; let's hope that ACL, Probe and Contact, Orcsbane, AdventureLine and all the others can keep coming up with the necessary motivation month after month. Give them your support.

Along with do-it-yourself magazines, do-it-yourself adventures have had a good year. Although *The Quill* has been around for two or three years, the release of Incentive's *Graphic Adventure Creator* has re-kindled a waning interest, and I'm glad to say that self-penned adventures are still going strong. To be brutally honest, only one or maybe three *Quill*- and *GAC*-users produce anything of great importance, but the good thing is that there is a continual input of informed enthusiasm – 'informed' because the authors are writing *for* fellow adventurers.

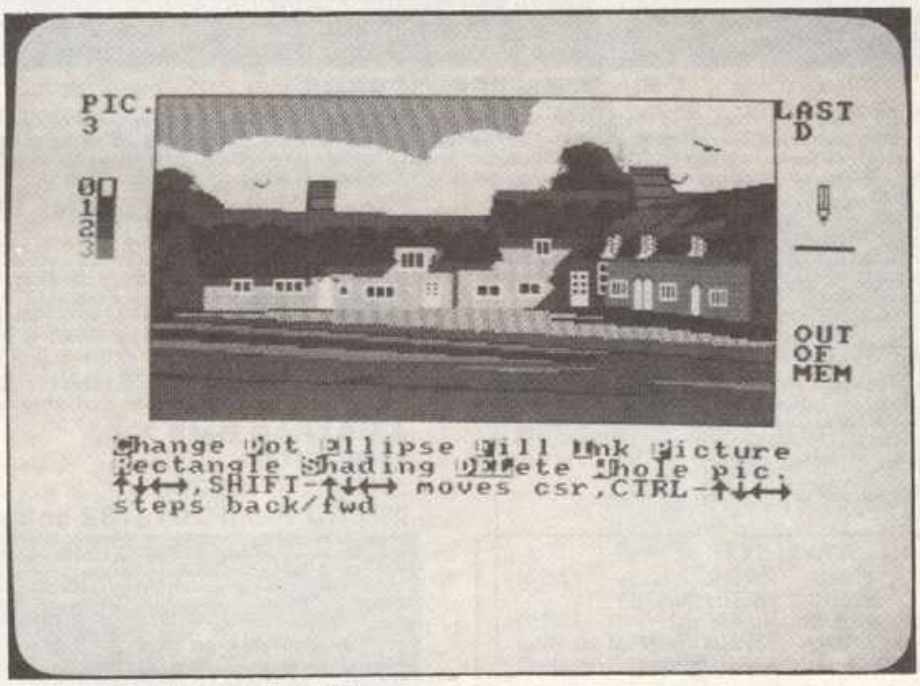
Now, while I would be at the head of the queue of people hollering for more originality and freshness, I also enjoy a good old traditional goblin-bash. There have been several of these in the past year, but unfortunately the good ones get labelled along with the bad ones, and traditional fairy-filled adventures have rather a bad name at the moment.

In fact, there is a wealth of material to be plundered – the scenario is merely the skeleton on which the flesh of the game hangs.

Both Global's *Monsters of Murdac* and *The Pawn* not to forget Level 9's *Middle Earth* trilogy (and Talent's *Zkul*) are all excellent adventures set in the usual land of Tharg.

Yes, there are many many more that substitute the well-worn themes for originality, but the better adventure authors can write a superb story using *any* background, and I have to say that the Glowing Green Fire-spitting Dragon of Trazibon is a whole lot more interesting than Nelson Gabriel's Wine Bar.

I have every hope that 1987 will be as good for adventurers as the previous four or five years have been. Although the stories we are presented with will become ever more sophisticated, we are lucky that amateur efforts can often give as much, and sometimes more, pleasure as the 'mega-games'.



The Graphic Adventure Creator

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand.

Fill in the coupon, explaining your problem, send it to us, and a fellow adventurer may be able to help.

Remember – the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

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Problem .....
.....
Name .....
Address .....
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Beefing up the ST range

Atari's much-touted 520ST with built-in disc drive and TV modulator has arrived in the UK. John Lettice gives it the once-over

There may not be that many of them out there yet, but the Atari ST has just about achieved the status of industry standard dream machine. The hardware is fast and versatile and, software permitting, the ST can produce spectacular sound and graphics – all that's needed, besides this, is for the machine to actually sell.

Which is where the new 520STFM comes in. The F stands for floppy and the M for modulator, the basic point being that the new machine has both of these built in. Effectively it's Atari's new entry-level ST, and you should be hearing a lot more about it over the next year or so. Although it's available now, there aren't many around. Distribution should pick up in the next couple of months or so.

The most striking things about the machine are its size and weight. It's much deeper than the earlier 520, the extra casing housing the single 3½ inch floppy and power supply, and although its predecessor is no lightweight the FM is particularly heavy.

The addition of the disc drive and power supply means the machine runs significantly hotter than the older STs, particularly as the ventilation hasn't been significantly improved, but the machine seems to cope well with the higher temperature.

As far as looks go the FM conforms to standard ST styling, but appearances can be deceptive. The keyboard, for example, has had a thorough going over, and is now much more responsive than on earlier models.

However, according to Atari, this does not mean that the FM is being aimed at the business market. The machine is instead being aimed initially at the more sophisticated second time buyer market, with the business end of the Atari range checking in at 1040 ST level.

The other major difference is, of course, the disc drive, which sits on the right hand side of the machine towards the rear, but although it's out of your direct line of sight there's a light round the front that tells you when it's working. Putting this light in is so eminently sensible it makes you wonder why Atari didn't put a light on the caps lock as well . . .

Keyboard layout remains the same as on previous models, with the qwerty section on the left, cursor cluster and numeric keypad to the right and function keys along the top – pretty well a standard 'business' micro configuration, in fact.

The remaining changes to the outside are largely cosmetic, reinforcing the sturdier image Atari is trying to project for the ST. The mouse and joystick ports have been moved from the side to a recess under the front of the keyboard, while the reset and on/off switch have moved to the other side of the backplate. The reset is still a little too prominent, and could be knocked accidentally, but the on/off is, if anything, too stiff.

Alongside these you have the customary plethora of ST interfaces, including Centronics, RS232, RGB, disc and midi-in, -out, -shake it all about . . . Besides these the new TV output provides a good, stable picture, and while it's obviously not of monitor quality it's just as good as you'll get with other entry-level systems.

This addition is actually more important than it sounds, as it allows Atari to extend the machine's market down to people who can just about afford a machine but not a monitor.

Inside, the machine has also gone through something of a revamp. The circuit board's clean and the socketed chips are now fitted with clips to stop them working loose.

There's also enough shielding to make it proof against coffee spills, the odd cosmic ray and most other things short of the Star Wars programme, and despite the number of modifications Atari has made to the ST since its launch, the FM's circuit board is neatly laid out, and has clearly been the subject of a redesign.

Functionally the FM operates just like a standard ST, so if you're using games and graphics software you could find yourself missing the keyboard improvements completely. These do, however, make word processing and other 'serious' tasks a lot easier.

Similarly, the fact that the ST uses fairly standard Centronics and RS232 port configurations make it easy to hook it up to printers, modems and the like.

On the software side there appears to have been some alteration to what Atari bundles with the machine. The review FM, supplied by Silica Shop, came with no software at all, although this was apparently an error. The standard FM is supposed to come with Basic discs only, while Silica also intends to bundle various pieces of public domain software with it.

There's a large amount of third party software available for the machine, but as far as quality goes it's still patchy, with few companies coming anywhere near taxing the machine to its limits, and few of the major business software houses writing for it yet.

Atari plans to beef up the ST's software range with more active encouragement and support for the software houses, and this, coupled with the wider user base, which price cuts will generate, should improve matters considerably in the near future.

The ultimate success of the FM does of course rest on its price. The games software industry is currently salivating at the prospect of writing for it, but Atari is certainly not going to bring its cost down below £200 immediately, and the games industry in this country has been built on the sub-£200 micro. It could, however, find a good sized market at around £250, which is a price Atari is perfectly able to meet.

If it does go down this low the machine could also make inroads into the Amstrad market, as it would be undercutting the PC slightly, but would remain a significantly more powerful machine.

Naturally it takes more than price to establish a machine – it takes software backup and marketing spend, both of which Atari UK is now committed to. The next few months should be interesting . . .

The Atari 520STFM is available from Silica Shop, 1–4 The Mews, Hatherley Road, Sidcup, Kent (01-309 1111).

Rolling the ball

Chris Jenkins looks at an alternative to the joystick

In an effort to overcome the "keyboard barrier" between the computer and its operator, many types of input device have been devised. The most familiar is the joystick, which, on many machines, is limited by being able only to input one of eight directional commands. More useful is the analogue joystick, which actually defines a screen position in terms of X-Y parameters.

Then there is the mouse, which, though popular, has its disadvantages – not least the fact that it demands a lot of desk space – so a useful alternative is the trackball.

Most familiar to many computer users through arcade games like *Missile Command,* the trackball in fact has a distinguished history evolving through applications such as radar scanning. The package on offer from Metrotec includes a trackball, the RB2, manufactured by avionics giant Marconi, so you can be sure that the quality of the hardware is high. This is reflected in the price.

The RB2 is a unit about the size of a paperback book. It has four non-slip rubber feet and a tilted face. Resting your palm on the lower half, you control the ball itself – which is about 2" in diameter – and the three control buttons above it, with your fingertips.

Metrotec has devised an interface for the Amstrad CPCs, which connects the trackball to the Amstrad's joystick port. There's also a follow-on connector for the power supply, so the end result is something of a mess of spaghetti. However, everything works perfectly.

The trackball is supplied with two graphics packages on disc; *Easiart,* an icon-driven drawing program, and a CAD package called *Easidraw*. *Easiart* has three control options; trackball, mouse or joystick. The joystick option, apart from allowing only eight-directional movement, is very slow, while using the trackball it operates very quickly.

Easiart has a range of menus at the top of the screen, and icons to select options at the right hand side. All the expected facilities are there; lines, freehand, polygons, fills, airbrush, text, zoom, cut and paste, colour select, and disc filing.

As with most "mice", the control buttons on the trackball are used to select, then switch on or off, the various drawing options. On the other program included, *Easidraw,* the left button is Execute, the centre Move, and the right Cancel. This program is a cut-down CAD routine with a DMP-2000 screen dump facility and a small selection of line, circle and hatching facilities.

Overall the RB2 Trackball works excellently, and the software packages provided demonstrate just how much better it is than a joystick for graphics applications. Although the price is quite justified in view of the quality of the hardware, it may deter many potential purchasers, which will be a great pity.

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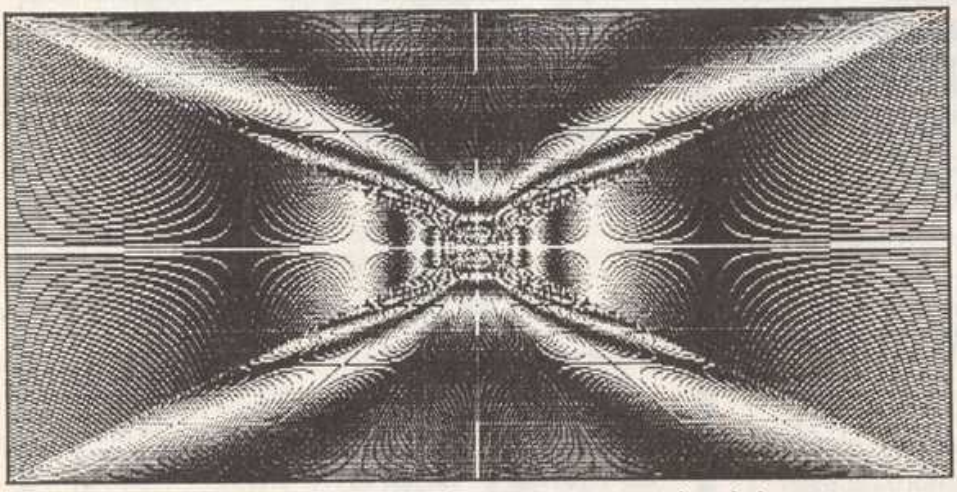
The PCW picture show

GOS is a graphics programming utility for the PCW machines, released by Mirrorsoft. David Lawrence reports

One of the benefits of writing complicated programs the right way – with each different function separated out into a neat unit of code – is that you end up, having finished your package, with a large collection of working routines which you can quickly incorporate into the next product, and the next, and so on ad infinitum.

Of course, if you happen to be writing a desk-top publishing package which needs to be able to handle a wide variety of graphics, windows, fonts of different kinds and all of it controlled by pop-up menus, you might just look at the bits and pieces you have written and decide that what they really add up to is a complete set of routines for anyone who wants to add graphics, fancy text and pop-up menus to their own programs.

To be specific, if you were Mirrorsoft and just putting the finishing touches to *Fleet Street Editor* for the PCW 8512, you might just decide that the bits and pieces that made up the program were so good that they should be packaged and sold in their own right as the PCW *Graphics Operating System*. So it was that *GOS* was born and is about to be launched into the PCW market place.



Hi-res capabilities illustrated by an interference pattern over the whole screen

The first question that comes to mind on seeing *GOS* is, "why bother?", when every PCW comes equipped with a version of Digital Research's GSX (Graphics Extension) system, allowing a range of graphics and text to be added to displays. Like GSX, *GOS* is grafted on to existing programs and languages, so it is not a new language but a tool which can be controlled from other languages and programs. The problem is that unlike GSX, *GOS* has not been around for years and so doesn't have a large body of programs which make use of its capabilities to enhance their displays.

These would be difficult points to answer if Amstrad and Digital had bothered to supply more than a token GSX system as part of the standard package. The PCW's GSX, though it works satisfactorily, is completely out of date and, compared to other versions of GSX around, the PCW version is stripped down to the bare bones of what it is possible to sell and still call it GSX.

By opting for such an inferior system Digital has effectively left the field to others – the first full-feature graphics operating system to establish a decent user base will very quickly become the standard and *GOS* looks like a very good contender for that position.

So what exactly is *GOS?* Put simply it is an extra self-contained section of code which is grafted on to a program or language in memory. You can use the system with any program or language which can be restricted to use only memory below address 49152 (C000h). Once the memory has been reserved, the system is very similar to using GSX.

To send commands to *GOS,* certain values are placed into specified memory locations and then a call made to *GOS* to carry out the command. That means high resolution for programs written in almost any language available for the PCW, including Mallard Basic, though as with GSX only some 17K of memory is available for programs when Basic is loaded.

The beauty of *GOS* is that its self-contained code is impressively fast and the speed with which individual commands are executed is unaffected by the language being used. Of course, there will be considerable differences in speed between, say, a m/c and a Basic program using the same commands, but the *GOS* commands themselves will execute at the same speed in both.

What that means is that some very effective graphic and menu routines can be added into a Basic program without being let down by the general slowness of the language. As an example, the fairly complex demonstration program supplied with the prototype *GOS* system executes in one minute in its machine code version and one minute 55 seconds in Basic, and that is a very far cry from the usual differential between the two languages.

The range of *GOS* commands is impressive, and far too extensive to list in full here, but the areas covered are:

- Menu handling: the ability to define a menu box, save the screen area it will cover, place the box on the screen, remove it and replace the original screen area, and to place a highlighted bar in the menu. The menu place and remove commands in particular are impressively fast and well up to the standard of many commercial programs on faster machines.
- Screen saving: screen contents can be loaded from or saved to disc, including the ability to display particular items from a library of designs. A screen dump facility is also included as one of the commands, so a dump can be taken at any time during the course of a program.
- Text: high resolution text can be placed on the screen in a variety of fonts and sizes and text can be manipulated by inserting material into text on screen.
- Graphics commands: point plotting, line drawing, boxes, ellipses, circles, vertical and horizontal bars.
- Drawing mode: all items can be drawn in foreground or background colour and using "exclusive or" *(Xor)* mode, where each pixel touched is changed from foreground to background or vice-versa. Shapes involving lines can be modified by setting the width of the line to be used and its style – unbroken, dotted etc.
- Block operations: areas of screen can be moved or copied from one place to another, cleared, rotated, mirrored, stretched or shrunk. There is a fill command, the only one that appears slow, plus the ability to fill areas with user-defined patterns.
- Mouse facilities: the system can read information from a mouse device and display a moving cursor.

Despite all these features there are, admittedly, one or two shortcomings compared to the ideal laid down by the GSX concept. Text can be displayed at specified positions but no mention is made of a separate character cursor to allow the current position of text output

continued on page 20 ▶

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◀ continued from page 18

to be remembered. To create a polyline, or line made up of several sections, would require several commands in *GOS* but only one in GSX.

There is no provision for predefined markers, making the task of creating graphs that little harder.

Perhaps most of all, for those selling expensive packages which use more than a standard PCW, *GOS* lacks GSX's flexibility when it comes to handling output to and input from a wide range of different devices.

These, however, are small points when compared to the wide range of functions *GOS* will carry out and when that range is compared with the severely cut-down GSX available with the PCW – it is unfair to compare the system with a theoretically perfect GSX which simply isn't available to PCW users.

Who will buy *GOS* depends on who needs its graphics capabilities badly enough.

It would be wrong to say that the system is easy to learn for the average PCW user. Poking values into memory locations and making calls with the *Usr* command is an unfamiliar process for most people.

Having said that, the feel of the system is far more friendly than GSX, with its variety of different arrays to be filled or read. Provided that a programmer is prepared to follow the manual for a while, no particular problems should arise. Even so, it is not the kind of product that anyone who would like to create a few pictures for fun will buy.

The real market for *GOS* must surely be anyone who wants to give a program a professional feel at the cost of almost no effort. The ability to add graphics touches, special typefaces, pop-up menus and dialogue boxes without having to exercise any great skill will surely be an irresistible temptation. Of course, the end users of any program based around *GOS*'s capabilities will themselves need to have *GOS* (or have it supplied with the program) and there is the rub.

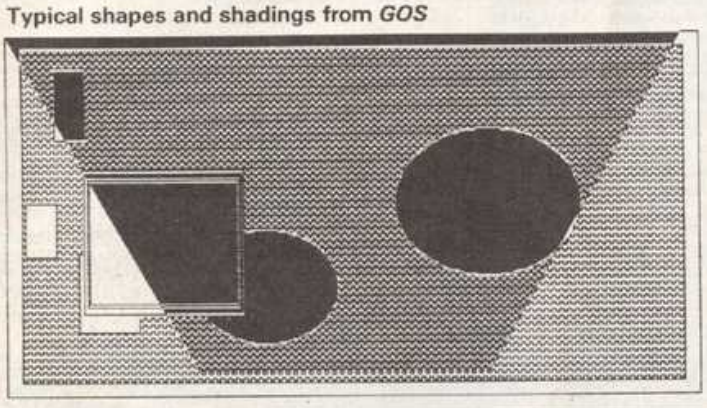
Mirrorsoft, which is publishing *GOS*, has to make the decision as to how free it will be with licences to distribute the system along with software that uses it. Without a liberal attitude to distribution there will be no user base, and without a user base there is no point in writing programs to make use of *GOS*.

Perhaps Mirrorsoft should learn from Digital's distribution of GSX. In this country, it is possible to get GSX free on a number of machines, including the PCW. What you don't get is a decent manual – that costs you up to £40 extra.

The result is that there are a lot of GSX equipped machines to encourage programmers and that all the actual and would-be programmers buy a manual and toolkit – the best of both worlds.

The *Graphics Operating System* would benefit from that kind of faith being shown in its ultimate success, and the majority of PCW owners would benefit from the quality of the programs that would be produced.

Typical shapes and shadings from *GOS*



Program *Graphics Operating System*
Micro Amstrad PCWs **Price** £69.95
Supplier Mirrorsoft, Maxwell House, Worship Street, London EC1.

Hold the front page!

GAP's valiant attempt to produce a 'desktop publishing' package for the QL proves that the machine is full of possibilities, especially if you are prepared to add further peripherals. However, part of the philosophy behind *Front Page* is that it can be used with no extras other than a printer, and the cost, £22.50, is way under that of most more sophisticated programs.

Compiled using Liberation Software's *Q-Liberator, Front Page* has none of the fancy pull-down windows, icons or mouse control options of its more expensive rivals. After producing a working copy tailored for your particular printer (Epson types only so far), you work using a system of menus which appear at the bottom of the screen. The function keys are used to call up sub-menus, which in turn have their own sub-commands.

In order to produce a 'desktop publishing' package rather than a straightforward word processor of graphics package, you will need options for text handling, graphic design, cut and paste and page make-up. *Front Page* has all these, in varying degrees of sophistication.

The screen cursor indicates your current working position on a 100-column width. There are also 100 rows, but due to memory limitations these are treated as two pages of 50 rows each. Any size of window can be defined by entering the screen co-ordinates for top left and bottom right hand corners, then moved around the page.

The windows can be filled using either straight text, in three different widths and two heights; or using an alternative character set accessed using F5; or with graphics. There are eight UDGs available from the main menu, and another eight hidden; you can also reverse all sixteen.

The UDG's are used with a simple move/draw/erase routine to build up, say, giant letters or simple patterns. There's also a freehand draw mode which can be used to touch up the UDG designs, or for simple sketches.

Automatically saved

In order to minimise the possibility of losing work, there's a *Temp File* routine which automatically saves your efforts as you go along. You can also work with a Ram disk function if the slowness of the back-up bothers you. Error trapping on this version, 1.01, is still pretty lax, although there are many improvements on the original version.

The main problem in assessing *Front Page* is the lack of a suitable comparison; you may well object to the lack of pull-down menus, icons, joystick or mouse control, sophisticated graphics, disk transfer, or whatever, but at least the program does what it is meant to do, and claims no more. GAP's current advertisement was produced using the package, and gives you a good idea of its possibilities. Further enhancements are in the works, and I look forward to seeing even better versions of this stimulating program once a little user feedback has worked its way through the system.

Chris Jenkins

Program *Front Page* **Micro** Sinclair QL **Price** £22.50 **Supplier** GAP Software, 17 St John's Terrace, London E7 8BX.

Comm+ – a second opinion

David Wallin sorts through his mailbag, and finds a reappraisal of Comm+, and a query about building a modem

This week, I'll be answering some of your E-Mail questions that have been left on Prometheus over the past few weeks. I also have some interesting points on *Comm+*, which come from C A McAndrew.

Firstly though, I thought you might like to know about my section of Musictel Plus which is now on-line. It can be accessed from the main menu by typing C and is called the PCW Communications Section.

It's there for you to leave me messages, questions, comments, hints and tips, etc. I'll also be writing in the section once a month to what's coming up on this page in *Popular* in the near future and the latest news in the comms world. This board is in addition to my section on Prometheus; as Prometheus is viewdata and Musictel is Ascii, anyone with a modem can now contact me.

Messages here

So, if you have any queries, comments, etc, the alternatives are:
Telecom Gold: 72:MAG30190
Musictel Plus: Section C from the main menu (0843 590000, 300/300, 1200/75 Ascii)
Musictel HQ: Leave mail to David 'PCW' Wallin (01-455 0843, 300/300, 1200/75 Ascii)
Gods Box: Leave mail to David Wallin: *Gods* Personal – Communicator (01-994 9119, 300/300, 1200/75, 1200/1200 Ascii)
Prometheus: Page **08#* (01-300 7177 viewdata)
Telex: 265871 MONREF G (Quoting ref 72:MAG30190 at the start of the message.)
. . . or write to me at *Popular* at the usual address.

Now on to your letters. C A McAndrew of Caves, a computer/comms consultancy, had some interesting comments to make about the piece on *Comm+* a few weeks back. He points out that the program is available in about 100 versions, for both 8 and 16-bit machines (CP/M-80, CP/M-86, PCDOS, MSDOS, etc), whereas I was given to understand that there was not really a 16-bit version available and that other, similar packages were available instead. I'm sorry for any trouble this mix-up has caused.

Mr McAndrew next goes on to mention the macro facility, more well known to the rest of us as JCFs. He says there are superb full macro facilities, not to be confused with the simple log on files often erroneously described as a macro. Quite true, the macro/JCF facility is very powerful and should not be confused with simple log-on files that many other programs offer. These just send id/name, password and maybe one or two more lines of text (I use *Mail Read* (Telecom Gold function) as the last line of a log-on file from *Chit-Chat*).

"JCFs . . . give you control over all of Comm+'s commands available in either on- or off-line mode"

Some programs have a limited macro facility (*Chit-Chat* has limited macro and automatic log-on) but none that I have ever seen come near to the power of that of *Comm+*. The JCFs are powerful enough to be the control software of a Bulletin Board, and recently one has been started up on 01-833 1450. I think this is for *Comm+* owners only and the software serial number is needed to identify the user.

Hard-going manual

Still on JCFs Mr McAndrew points out that they give you control over all of *Comm+*'s commands available in either on- or off-line mode. He also mentions that auto-dial routines may be written as JCFs to make the software easier to use.

Lastly he says that the only minus of *Comm+* is that the manual is a little hard going in places. Thinking back, I suppose parts may be a bit complex to the beginner, but generally is well laid out and of a good quality. My only complaint of the software is that it is a little hard to use. I fully agree with Mr McAndrew's assertion that *Comm+* is one of the best pieces of communications software available today – not a toy but a full blooded communications tool. If anyone wants to contact Caves, its telephone number is 0274 604230. I hope this clarifies some things about *Comm+*.

Next on to a question from Jerry Specky. It concerns building a modem – what lines, voltages, etc, are used in the phone network. Three places to try for advice are:

1) Prometheus, run by Barry Spencer who is a BT engineer and he may be able to help.
2) Ade Truelove of APAS (formerly CCCBB) who knows a good amount about comms, and who I believe has built a modem himself. APAS is on 0249-817077, 300/300 baud, Ring Back.
3) Maplin Electronics, which sells the AM7910 chip, which is basically the main component of a modem. It can handle the Tx and Rx in all duplex at 74, 300, 600 and 1200 baud in Bell or CCITT standards. It also has half of the auto answer circuitry in it. Contacting Maplin could prove useful in this matter.

Controlling the cursor

Graeme Barnes wants to know how to edit when typing in Prestel mode. I'm a bit confused at this one, but I think he wants to know how to move the cursor around the screen when typing on a viewdata frame. It depends on the computer and software in use. With *Chit-Chat* on the Amstrad PCW8256 it is the four cursor keys. It is the same on most viewdata emulations: if not, the Ascii values I would try out are (all decimal); 8 (Control–H), 9 (Control–I), 10 (Control–J) and 11 (Control–K). I hope these work. If you don't have a Control Key then you've got problems! (Let me know what software and hardware you're using and I might have a better answer.)

Born in the USA – now available in the UK

Mark Jenkins looks at DX-Droid, from Hybrid Arts, specifically designed for use with the Yamaha DX7

Hybrid Arts has made a name for its computer music products in the US, where it has concentrated for a couple of years on the eight-bit Atari micros. To ease the future-shock suffered by musicians when entering the world of micro-computers, Hybrid wisely introduced the idea of selling complete micro music packages – so, for instance, its first Midi composer software, the Midi-Mate Interface, came complete with an Atari 800 for just a few hundred dollars.

More recently, Hybrid has been concentrating its attention on the Atari ST micros, although it has by no means abandoned the eight-bit range (having recently developed a graphic editing package for the new Kawai K3 Freewave synthesiser using an Atari 800, for instance).

The first Hybrid Arts products are now reaching the UK, thanks to Syndromic Music of Muswell Hill in London, and we're promised a very exciting range of new introductions over the coming months. The professional ST sequencer *Master Tracks,* for instance, goes one up on the Steinberg *Pro 24* by both generating and reading a SMPTE synchronisation code, which makes it very easy to lock your micro-controlled music up to film and video.

Obviously the use of the more expensive ST range has led to a move upmarket though. One of the best-selling Hybrid packages to date has been *DX-Droid,* which is aimed specifically at the expensive Yamaha DX7 synth. Presumably it will also work with the DX7II synth which is to be introduced early next year – the synth has many new features such as split and layer playing, LFO panning, quieter output, more memories and optional floppy disc drive for voice storage, but its basic sound circuitry remains the same.

While *DX-Droid* will only be of interest to existing Yamaha owners, *EZ-Track ST* may well introduce many new users to computerised music. It's a twenty-track Midi composer which uses the ST's own Midi sockets, and is interesting in that it is always in record mode. Any music you play will be overdubbed onto the existing music, but will only be retained if you choose to do so. This saves a lot of time in setting up a record mode, switching it off and playing back the results of your performance, although more professional composers could well be made a little uneasy by this kind of operation. Anyway, we'll look at *EZ-Track* in detail shortly.

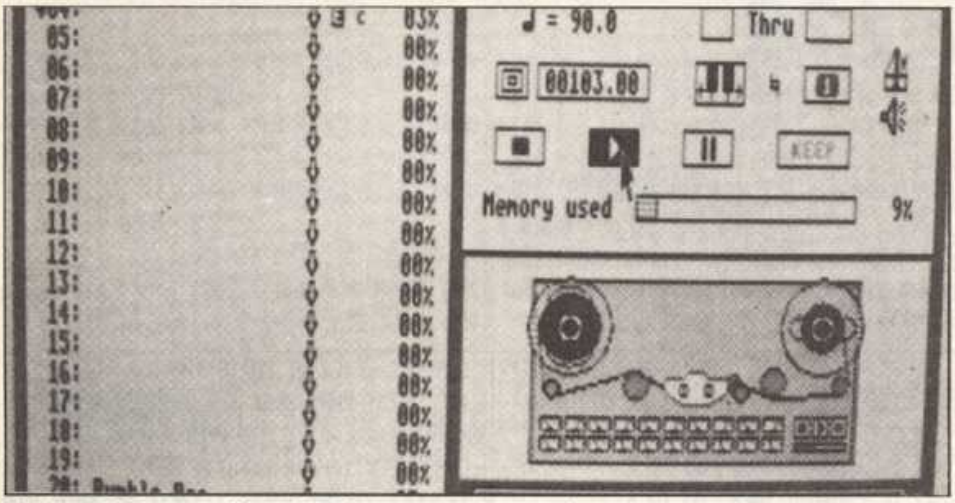
DX-Droid opens with an impressive painting of a 520ST, a DX7 and a TX816 rack which contains the equivalent of eight DX7 synths (incidentally, the TX system is due to be updated too, and it's not quite clear what will happen to the TX7 module which *DX-Droid* also handles). You will need an original *DX-Droid* disc to operate the system (a copy is only useful to try to save a partly corrupted program disc) plus a blank data disc to store your new sounds; colour or monochrome monitors can be used.

DX-Droid can be used to create new DX sounds either one at a time or in a whole bank of 32 sounds. A 'workspace' holds one sound while a 'workbank' holds a whole bank; each disc can hold up to 1608 sounds comprising 18 banks and 1032 individual voices. Whole banks of Function settings – such as Portamento depth, Poly mode, and so on – are stored for use by a TX7 module, although only one can be held by a DX7.

Setting up includes switching the DX7 to System Information Available which allows sound data to be dumped via Midi. *DX-Droid* will erase the contents of any data disc you insert which hasn't been set up with the necessary data tables, so you have to be careful not to start off a session with anything you want to keep. The menu and numerical edit screens use the Atari mouse, while some others require quite a lot of keyboard manipulation; the main menu screen, for instance, shows the current name of the workspace, the workspace monitoring mode, the number of files on the data disc, the number of unused file spaces, and the numbers of locked and unlocked files.

Initialise WS (initialise workspace) creates a 'blank' sound similar but not identical to the thin sine wave created by initialising a voice on the DX7 itself. You can then load up a sound to edit it (Read File to *WS*) and load function parameters as well for a TX7 (load F-Para to *WS*). Files you're happy with can be dumped to the synth via Midi.

The actual editing process can take several forms – you can create a new sound randomly using the *Droid* func-



EZ Track ST – a good introduction to computer music

tions or edit specific parameters using the numeric editor, which displays operator envelope rates as R1–R4, Fine frequency as FFQ, and so on. One to 16 notes can be sent as a chord to test the sound you've created if you're using keyboardless TX modules.

The *Droid 1 WS* program generates sounds which are described as 'conservative'; each should be musically useful in its raw form, which is more or less what we found. Some benefit from a little tweaking, but there's very little in the way of wacky special effects sounds. The same does not apply to *Droid 2*, which has most of the 'intelligent' aspects removed so virtually any sound could be created. Some of these are very complex, and of course it could be difficult to tell exactly how they're constructed without looking very carefully at the Editor page.

Av Sound creates an exact average between two sounds, so you could create a stringy piano or a violin-like horn, which could be handy, while *Glide* does the same thing in up to 16 discrete steps. *Distort* alters a random number of parameters by a random amount, sometimes giving very exciting results, while *Droid 1, Droid 2 18 banks* will simply replace all 18 banks of data on the current disc and work bank with new *Droid* sounds!

Overall, I found the organisation of *DX-Droid* offputting at first. There seems to be an enormous amount of data on-screen and a lot of it can only be manipulated with the keyboard rather than the mouse.

However, if you're fairly familiar with DX synths you'll get into *DX-Droid* quite quickly, and find some spectacular results which will defy the abilities of even the most imaginative programmer – quite apart from the massive saving made on DX memory cartridges, which cost up to £70 for 32 storage spaces.

If you think *DX-Droid* a little out of your reach, don't panic – *CZ-Droid*, aimed at the budget Casio CZ-101, CZ-1000 and other synths, is on its way!

Syndromic Music, 24–26 Avenue Mews, London N10 3NP. Tel: 01-831 9489.

If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly*, 12–13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

Get writing – get Popular

Popular Computing Weekly always welcomes contributions from its readers for articles, features, and program listings.

Whether you want to write articles, see your programming masterpieces in print, pass on some words of wisdom, or simply let off steam, there's space in the magazine for you.

Ideas for **feature articles**, or completed articles, should be sent to Christina Erskine. All aspects of home computing are considered, but we cannot feasibly accept anything longer than 2,000 words, so brief is best. It's worth checking by phone or letter first that your article will be suitable. Payment is normally £35 per published page.

Technical editor Duncan Evans looks after the **program listings**, and articles on programming. We rely on you for our Programming section, so earn yourself a place in the *Popular* Hall of Fame (and £25 for each page we print) by having your program published. Even if it's not 100s of K of pure machine code, but a short snappy routine, thee may well be a place for it in **Bytes and Pieces** (£10 a shot).

Articles on any aspect of programming are also welcome – with short listings included if relevant.

Got something you feel needs saying oud and clear? Your opinions on any aspect of the computer industry are welcomed, so why not write in to the **Ziggurat** section? No more than 600 words, please. If published, we'll pay you £15.

So maybe it's not the money you're after, but you'd just like to have some say in the magazine.

For shorter comments, general observations or queries, there is of course the **Letter page**, with the tempting offer of a year's supply of *Popular* binders for the Star Letter each week.

for more specific points, our team of columnists are always willing to answer questions, and keen to hear the latest information. Drop your lines to **Tony Bridge** (adventure hints always gratefully received); **Tony Kendle** (who wants as many Arcade pokes, maps, solutions, etc, as possible); **David Wallin** (communications); **Kenn Garroch** (programming problems); **Mark Jenkins** (music queries and sample tapes) and **Martin Bryant** (computer chess comments).

All letters should be addressed to *Popular Computing Weekly*, 12–13 Little Newport Street, London WC2H 7PP. If you mark your letters with the department you want, things get processed much more quickly.

Left: the adventurous Tony Bridge. Right: the active Tony Kendle.

Disassembler 128

P W Norris

This disassembler was written for the Spectrum 128/+2 and utilises the RS232 port for a serial printer. If the program is to be used on any other Spectrum the instruction *Format 'P';1200* in line 1 must be removed.

The program will disassemble the Rom or any loadable machine code, the *IY, IX, ED* and *CB* instructions are fully catered for. The listing is in two parts, the Basic this week and the machine code next week.

```
  1 INK 7: CLEAR 30999: LOAD "c"CODE 31
000,1280: INK 0: PRINT AT 1,6;"DECIMAL D
ISASSEMBLER": FORMAT "p";1200
  2 PRINT AT 4,13;"KEY 1.";AT 6,1;"IF Y
OUR M/C IS LESS THAN 32768";AT 9,13;"KEY
 2.";AT 11,8;"TO DISASSEMBLE ";AT 14,10;
"ANY OTHER KEY.";AT 16,1;"IF YOUR M/C IS
 MORE THAN 32768"
  3 IF INKEY$="" THEN  GO TO 3
  4 IF INKEY$="2" THEN  GO TO 9
  6 IF INKEY$="1" THEN  CLS : PRINT AT
10,0;"START RECORDER TO LOAD YOUR M/C":
LOAD ""CODE 32768,32768: INK 0: CLS : PR
INT AT 10,0;"UP TO 32k OF M/C LOADED FRO
M          ADDRESS 32768": PRINT : PRINT
"      ANY KEY TO CONTINUE": PAUSE 0: G
O TO 9
  8 CLS : PRINT AT 10,0;"START RECORDER
 TO LOAD YOUR M/C": LOAD ""CODE : INK 0:
 CLS : PRINT AT 10,9;"M/CODE LOADED": PR
INT : PRINT "      ANY KEY TO CONTINUE":
 PAUSE 0
  9 CLS : LET o=28: PRINT AT 9,7;"START
 ADDRESS ?": INPUT "ADDRESS = ";X: CLS :
 PRINT AT 0,8;"DISASSEMBLY FROM";AT 1,13
;X: PRINT : PRINT : LET c=1: LET d=c+c:
LET e=8: LET o$=" ": LET q=e+e+c: LET z=
d+d+c: LET qq=32177: LET rr=32206: LET s
s=32239: LET tt=32252: LET g=32018: LET
a=31000: LET n=31771: LET p=31945: GO SU
B 400: LET j=x
  10 LET u=d+d: LET v=c+d
  11 INPUT ;"PRINTOUT ? ";o$
  12 IF o$="y" OR o$="Y" THEN  OPEN #2,"
p": INPUT ;"TO WHAT ADDRESS ? ";ZZ: LPRI
NT AT 0,0; "DISASSEMBLY FROM ";x;" to ";
zz: LPRINT CHR$ (10);CHR$ (10): LET ii=1
: LET o$=" ":  GO TO 14
  13 OPEN #2,"s": LET ii=0
  14 IF ii=1 THEN  IF j>zz THEN  OPEN #2
,"s": LET ii=0: CLEAR :  GO TO 2
  15 GO SUB 140: LET i=a+v*PEEK j: LET k
=PEEK i: LET l=PEEK (i+c): LET m=PEEK (i
+d): LET f=j: IF l=o+v THEN  GO TO 90
  21 IF l=o+u THEN  GO TO 55
  22 IF l=o+d THEN  GO TO 50
  24 LET i=n+((k-21)*u): PRINT CHR$ PEEK
 i;CHR$ PEEK (i+c);CHR$ PEEK (i+d);CHR$
PEEK (i+v);" ";: IF l=49 THEN  GO TO 42
  27 IF l=60 THEN  GO TO 84
  28 IF l>250 THEN  PRINT f$((254-l)*4+1
TO (254-l)*4+4);: LET j=j+d: GO TO 31
  29 LET i=p+((l-o)*d): GO SUB 80
  31 IF m=o+q+u THEN  GO TO 63
  32 IF m=o+q-u THEN  GO TO 67
  33 IF m=o+o+u THEN  GO TO 71
  34 IF m=o+o THEN  GO TO 74
  35 IF m>250 THEN  PRINT f$((254-m)*4+1
TO (254-m)*4+4);: LET j=j+c: GO TO 38
  36 LET i=p+((m-o)*d): GO SUB 80
  38 PRINT
  40 IF j>f THEN  GO TO 102
  41 LET j=j+c: GO TO 14
  42 PRINT PEEK (j+c);" ";: LET j=j+c: L
ET s=j: GO TO 36
  46 PRINT "(";PEEK (j+c)+256*PEEK (j+d)
;")";: LET j=j+d: RETURN
  50 GO SUB 170: GO TO 41
  55 GO SUB 300: GO TO 41
  63 PRINT PEEK (j+c);
  64 LET j=j+c: GO TO 38
  67 PRINT PEEK (j+c)+256*PEEK (j+d);: L
ET j=j+d: GO TO 38
  71 GO SUB 46: GO TO 38
  74 IF PEEK (j+c)>128 THEN  GO TO 77
  75 PRINT PEEK (j+c);: GO TO 64
  77 PRINT (PEEK (j+c))-256;: GO TO 64
  80 PRINT CHR$ PEEK i;CHR$ PEEK (i+c);"
";: RETURN
  84 GO SUB 46: GO TO 31
  90 LET b=c: FOR h=g TO g+155 STEP u: I
F PEEK (j+c)=(((PEEK h)-48)*100+(PEEK (h
+c)-48)*10+(PEEK (h+d)-48)) THEN  LET b=
PEEK (h+v)-48: GO SUB 350: GO TO 41
  94 NEXT h: GO SUB 350: GO TO 41
 102 GO SUB 120: LET f=f+c: GO TO 40
 120 PRINT f+c;TAB e;PEEK (f+c): RETURN
 140 PRINT j;TAB e;PEEK j;TAB q;: RETURN

 170 PRINT "(CB)": LET j=j+c: PRINT j;TA
B e;PEEK j;TAB q;: IF PEEK j>63 THEN  GO
 SUB 192: GO TO 176
 174 GO SUB 178
 176 RETURN
 178 LET aa=INT (PEEK j/e): PRINT CHR$ P
EEK (qq+(aa*v));CHR$ PEEK (qq+c+(aa*v));
CHR$ PEEK (qq+d+(aa*v));
 182 LET kk=PEEK j
 184 IF kk<0 THEN  LET kk=0: GO TO 190
 186 IF kk<e THEN  GO TO 190
 188 LET kk=kk-e: GO TO 184
 190 PRINT CHR$ PEEK (rr+(kk*u));CHR$ PE
EK (rr+c+(kk*u));CHR$ PEEK (rr+d+(kk*u))
;CHR$ PEEK (rr+v+(kk*u)): RETURN
 192 LET aa=INT (PEEK j/128): IF aa<0 TH
EN  LET aa=0
 194 PRINT CHR$ PEEK (ss+(aa*v));CHR$ PE
EK (ss+c+(aa*v));CHR$ PEEK (ss+d+(aa*v))
;: LET kk=PEEK j
 198 IF kk<64 THEN  GO TO 202
 200 LET kk=kk-64: GO TO 198
 202 LET kk=INT (kk/e): PRINT CHR$ PEEK
(tt+(kk*v));CHR$ PEEK ((tt+c)+(kk*v));CH
R$ PEEK ((tt+d)+(kk*v));: GO TO 182
 300 PRINT "(ED)": LET j=j+c: IF PEEK j>
159 THEN  GO TO 315
 302 LET gt=(PEEK j-64)*e: IF (gt=24 OR
gt=152 OR gt=280 OR gt=408) THEN  LET gt
=gt+c: GO TO 308
 305 IF (gt=88 OR gt=216 OR gt=344 OR gt
=472) THEN  LET gt=gt+c: GO TO 310
 306 LET gt=gt+c: PRINT j;TAB e;PEEK j;T
AB q;a$(gt TO gt+z+d): RETURN
 308 PRINT j;TAB e;PEEK j;TAB q;a$(gt TO
 gt+d);PEEK (j+c)+256*PEEK (j+d);a$(gt+u
 TO gt+z+d): GO TO 320
 310 PRINT j;TAB e;PEEK j;TAB q;a$(gt TO
 gt+z+c);PEEK (j+c)+256*PEEK (j+d);")":
GO TO 320
 315 LET gt=(PEEK j-160)*u+c: PRINT j;TA
B e;PEEK j;TAB q;i$(gt TO gt+v): RETURN
 320 LET j=j+c: PRINT j;TAB e;PEEK j: LE
T j=j+c: PRINT j;TAB e;PEEK j: RETURN
 350 IF PEEK j=221 THEN  PRINT "(IX)": L
ET w$="IX": GO TO 354
 352 PRINT "(IY)": LET w$="IY"
 354 LET j=j+c: PRINT j;TAB e;PEEK j;TAB
 q;: LET w=PEEK j: IF w=o+z THEN  GO TO
384
 355 IF w=o+o-u THEN  PRINT "INC ";: GO
TO 377
 356 IF w=o+o-v THEN  PRINT "DEC ";: GO
TO 377
 357 IF w=o+z+c THEN  GO TO 386
 358 IF w=42 THEN  GO TO 387
 359 IF w=o+o-d THEN  GO TO 390
 360 IF (w=9 OR w=25 OR w=35 OR w=41 OR
w=43 OR w=57) THEN  GO TO 382
 361 IF (w=225 OR w=227 OR w=229 OR w=23
3 OR w=249) THEN  GO TO 380
```

```
 362 IF w<112 THEN  PRINT o$(b*z+c TO b*
z+u);",";: GO TO 377
 364 IF w<120 THEN  PRINT o$(b*z+26 TO b
*z+27);: GO TO 379
 366 IF w<191 THEN  PRINT o$(b*z+61 TO b
*z+65);: GO TO 377
 367 IF PEEK (j+d)>62 THEN  GO TO 370
 368 LET b=INT (PEEK (j+d)/e): PRINT p$(
b*v+c TO b*v+v);: IF b=u+v THEN  LET b=v
+v
 369 GO TO 377
 370 IF PEEK (j+d)<127 THEN  LET b=INT (
PEEK (j+d)/e-e+c): PRINT p$(46 TO 48);:
GO TO 374
 372 IF PEEK (j+d)<191 THEN  LET b=INT (
PEEK (j+d)/e-16+c): PRINT p$(49 TO 51);:
 GO TO 374
 373 LET b=INT (PEEK (j+d)/e-24+c): PRIN
T p$(52 TO 54);
 374 PRINT p$(b*v+19 TO b*v+22);"(";w$;"
+";PEEK (j+c);")"
 375 LET j=j+c: PRINT j;TAB e;PEEK j: LE
T j=j+c: PRINT j;TAB e;PEEK j: RETURN
 377 PRINT "(";w$;"+";PEEK (j+c);")": LE
T j=j+c: PRINT j;TAB e;PEEK j: RETURN
 379 PRINT "(";w$;"+";PEEK (j+c);")";o$(
b*z+o TO b*z+o+c): LET j=j+c: PRINT j;TA
B e;PEEK j: RETURN
 380 PRINT n$(b*9+c TO b*9+e): RETURN
 382 PRINT m$(b*e+c TO b*e+e): RETURN
 384 PRINT "LD ";w$;", ";PEEK (j+c)+256*
PEEK (j+d): GO TO 375
 386 PRINT "LD (";PEEK (j+c)+256*PEEK (j
+d);"),";w$: GO TO 375
 387 PRINT "LD ";w$;",(";PEEK (j+c)+256*
PEEK (j+d);")": GO TO 375
 390 PRINT "LD (";w$;"+";PEEK (j+c);"),"
;PEEK (j+d): GO TO 375
 400 LET a$="IN b,(c)OUT(c),bSBChl,bcLD(
),bcNEG     RETN    IM 0    LD i,a  IN
c,(c)OUT(c),cADChl,bcLD bc,(          RET
I           LD r,a  IN d,(c)OUT(c),dSBC
hl,deLD( ),de                 IM 1    LD
a,i  IN e,(c)OUT(c),eADChl,deLD de,(
          IM 2    LD a,r  IN h,(c)OUT
(c),hSBChl,hlLD( ),hl
    RRD     IN l,(c)OUT(c),lADChl,hlLD
hl,(                          RLD     IN
f,(c)       SBChl,spLD( ),sp
                  IN a,(c)OUT(c),aADC
hl,spLD sp,(
    "
 405 LET i$="LDI CPI INI OUTI
    LDD CPD IND OUTD                LDI
RCPIRINIROTIR                   LDDRCPDRIND
ROTDR": LET m$="ADDix,bcADDix,deINC ix
ADDix,ixDEC ix  ADDix,sp": LET n$="POP i
x  EX(sp),ixPUSH ix  JP (ix)  LD sp,ix
": LET o$="LD b,LD c,LD d,LD e,LD h,LD l
,LD,b LD,c LD,d LD,e LD,h LD,l LD,a LD a
,ADDa,ADCa, SUB SBCa, AND  XOR  OR  CP
": LET p$="RLCRRC RL RRSLASRASRL 0, 1,
2, 3, 4, 5, 6, 7,BITRESSET"
 410 LET f$="(sp)(hl)(de)(bc)": RETURN
```


Khandal

Ian Grainger

Week three. Here's a run down of the icons used in the game.

1 – Give the object currently carried to the person in the room with you.
2 – Get the object in the room. You drop what you were previously carrying.
3 – Examine object carried.
4 – Help function.
5 – Fight the character in the room.
6 – Use the object you are carrying.

You can rotate the icons by pressing ':' and '.', and select one by pressing Space.

You control Khandal by using *Z* for left and *X* for right and *Enter* to pass through a door.

To avoid all the typing send £3 to Ian Grainger, 33 Wellfield Road, Wingate, Co. Durham, Cleveland.

```
2480 REM Open the door!
2490 ro$(room)=LEFT$(ro$(room),1)+"10"+R
IGHT$(ro$(room),1)
2500 CLS#2:PRINT#2,"Hey presto!","The do
or opens and the key vanishes."
2510 chs=242:xo=35:yo=12:GOSUB 1520
2520 ii=3:GOSUB 1030:obj=0:door=10
2530 GOSUB 610:GOSUB 2550:GOSUB 550
2540 GOTO 2470
2550 REM Open door
2560 LOCATE#1,10,6:PEN#1,1:PRINT#1,CHR$(
232)CHR$(233)CHR$(234)CHR$(235)
2570 FOR f=7 TO 10:LOCATE#1,10,f:PRINT#1
,CHR$(236)"  "CHR$(237):NEXT
2580 RETURN
2590 REM Closed door
2600 FOR f=7 TO 10:LOCATE#1,11,f:PRINT#1
,CHR$(238)CHR$(239):NEXT
2610 RETURN
2620 REM Data for Music!
2630 ENV 1,1,15,2,5,-3,4
2640 ENV 2,1,15,1,4,-2,2,7,-1,4
2650 ENV 3,1,15,1,15,-1,2
2660 ENV 4,7,2,1,14,-1,4
2670 ENV 5,7,-1,1
2680 ENT 1,1,-100,1,5,25,3
2690 ENT 2,1,-75,1,4,25,3
2700 RETURN
2710 DATA -2,-2,-3,-3,-4,-4,-5,-5,478,47
8,426,426,284,284,319,319,268,268
2720 DATA 268,268
2730 DATA 284,284,284,284,301,301,301,30
1,319,319,319,319,0,0,0,0,0,0,0,0
2740 DATA 478,478,379,379,319,319,284,28
4,268,268,284,284,319,319,379,379
2750 DATA 478,478,379,379,319,319,284,28
4,268,268,284,284,319,319,379,379
2760 DATA 319,319,319,319,638,638,319,31
9,358,358,358,358,716,716,319,319
2770 DATA 301,301,301,301,602,602,301,30
1,319,319,319,319,0,0,0,0,0,-1,-1
2780 DATA 0,-1,-1,0,2,2,2,2,0,0,2,2,0,0,
-2,-2,-3,-3,-4,-4,-5,-5,0,0,0
2790 DATA 0,0,1,1,1,284,284,284,284,284,
284,319,379,319,379,478,478,478
2800 DATA 478,478,478,319,319,319,319,31
9,319,358,402,358,426,536,536,536
2810 DATA 536,536,536,358,358,358,358,35
8,402,451,402,478,602,602,602,602
2820 DATA 602,402,402,358,358,358,358,35
8,358,268,268,239,239,239,239,239
2830 DATA 239,402,402,358,358,358,358,35
8,358,402,402,478,478,478,478,478
2840 DATA 478,451,451,426,426,426,426,42
6,426,379,379,358,358,358,358,358
2850 DATA 358,319,319,379,379,379,379,37
9,379,426,426,478,478,478,478,478
2860 DATA 478,0,0,-2,-2,-3,-3,-4,-4,-5,-
5,0,0,0,2,2,2,2,0,0,0,-5,-5,-4,-4
2870 DATA -3,-3,-2,-2,-3,-3,-4,-4,-5,-5
2880 REM Icon window
2890 DATA -16,-16,0,-8,16,-8,-16,-8,0,-8
,16,-16,56,0,16,16,0,8,-16,8,16,8,0,8,-1
6,16,-56,0,1000,-12,-12,0,-4,-16,-8,16,-
8,0,-4,12,-12,40,0,12,12,0,4,16,8,-16,8,
0,4,-12,12,-40,0
2900 REM Room Data
2910 DATA 1,13,9,9,11,9,11,11,9,8,1,12,1
,11,9,8,5,8,1,13,9,9,10,0
```

Programming: Amstrad CPCs

```
2920 REM Machine Code Data
2930 DATA DD6601DD6E0022FA,3AB
2940 DATA 5FDD7E0432FD5FDD,429
2950 DATA 7E0232FC5FDD6607,357
2960 DATA DD6E0622FE5FC330,3C3
2970 DATA 8000000000000000,80
2980 DATA 0000000000000000,0
2990 DATA 2AFE5FED5BFA5FED,515
3000 DATA 4BFC5FC5E51A0077,3e1
3010 DATA 231310F9E1010008,229
3020 DATA 0930040150C009C1,218
3030 DATA 0D20E8C900000000,1DE
3040 DATA 0000000000000000,0
3050 REM Graphics Data for Icons & Objects
3060 DATA 1,5,5,21,21,21,53,63,0,64,96,96,96,108,108,252,63,63,63,63,63,63,31,31,248,248,248,240,240,240,224,224
3070 DATA 0,0,0,15,16,36,69,133,0,0,0,240,8,36,162,161,132,67,32,16,15,0,0,0,33,194,4,8,240,0,0,0
3080 DATA 0,0,0,0,0,0,0,1,0,2,12,28,56,112,224,192,35,55,30,28,62,115,96,0,128,0,0,0,0,0,0,0
3090 DATA 0,15,31,31,31,15,7,7,6,6,140,140,156,156,252,248,15,31,63,63,55,55,55,55,248,248,248,248,248,248,248,248
3100 DATA 0,3,7,14,4,0,1,3,0,248,255,15,15,28,152,192,3,1,0,12,28,56,255,255,192,128,0,8,24,56,240,224
3110 DATA 0,0,0,0,0,0,0,127,0,0,0,14,17,17,17,241,255,127,16,56,56,40,40,0,241,241,17,17,17,14,0,0
3120 DATA 224,152,134,129,153,153,129,129,7,25,97,141,141,129,177,177,177,177,129,177,177,134,152,224,129,141,141,129,129,97,25,7
3130 DATA 0,0,0,31,31,31,31,31,0,0,12,254,243,247,230,230,31,31,31,31,31,31,0,230,230,230,230,236,248,224,0
3140 DATA 0,3,4,8,8,8,8,8,0,252,10,18,30,16,16,16,8,8,8,8,63,32,64,63,16,16,16,16,200,72,144,224
3150 DATA 0,7,10,9,11,59,123,107,0,240,40,200,232,238,239,235,105,106,103,96,48,56,31,7,203,43,243,3,6,14,252,240
3160 DATA 0,63,32,47,32,47,32,47,0,252,4,252,4,196,4,244,32,47,32,47,32,32,63,0,4,244,4,4,52,4,252,0
3170 DATA 0,63,32,34,42,43,47,47,0,252,4,4,132,132,196,228,47,47,39,39,39,39,32,63,244,196,196,196,132,132,4,252
3180 DATA 0,0,0,0,42,127,127,127,0,0,0,1,131,254,254,254,127,42,0,0,0,0,0,0,254,190,30,30,30,15,7,0
3190 DATA 0,0,30,33,33,33,33,31,0,0,251,4,4,4,255,0,0,0,223,32,32,32,255,0,0,0,120,132,132,132,132,248,33,33,33,30,33,33,33,30
3200 DATA 132,132,132,120,132,132,132,120,109,109,109,109,109,109,109,109,182,182,182,182,182,182,182,2,34,123,255,255,255,255,0,72,254,255,255,255,255,255
3210 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
3220 REM Object data
3230 DATA Key,Key,Key,Key,Key,Stamp Album,Pewter Tankard,Scroll,Diamond Ring,Newspaper,Cornflakes,Electro-Plasmic Ray Gun
3240 REM Examination data
3250 DATA "Mmm. It says:- Room 14"
3260 DATA "Well dawg gawn it! It says:- Room 7"
3270 DATA "On the side in red lipstick reads:-  With all my love, for room 5"
3280 DATA "By jove chaps. It says:- Room 23"
3290 DATA "Jumping Jalopies! It says:- Room 8"
3300 DATA "Inscribed on the front page is a      message reading: If found, please     return to The Flymat, Room 18, The    Complex."
3310 DATA "Engraved on the side it says:-       Presented to popular computing weekly for all of their sterling work in the computer field."
3320 DATA "Congratulations! This scroll means youhave finished your objective and      gained eternal life, unfortunatly, youcan't put this to good use until my next game appears! Anyway Well Done!"
3330 DATA "Wow! What a big one. Diamond that is! It will make someone very happy."
3340 DATA "An advert reads:-
        Get P.C.W. the best mag around."
3350 DATA "Best before 22nd OCTOBER 1969"
3360 DATA "Whoops, on examination, you        accidently pull the trigger and shoot yourself in the foot. Your body eruptsinto a multitude of coloured   particles. How invigurating, not to mention beautiful! Of course, you are dead!"
3370 REM Use data
3380 DATA "","","","",""
3390 DATA "You can't. It isn't yours!"
3400 DATA "You stand the tankard on your head,  but it doesn't do much for your image,so you stop."
3410 DATA "You stand on the scroll, but it only  makes it dirty!"
3420 DATA "It don't seem to fit yer finger boy!"
3430 DATA "You pause for a while to read the     Newspaper- Press Space to restart."
3440 DATA "You dip your hand into the packet and eat a handfull of flakes. Oh boy do   you feel terrible. Argg...You Choke   and die.Didn't you read the sell by   date?"
3450 DATA "Pow, Pow, Pow.....Pow, Pow,Pow, Pow, You fire the gun in all directions butit don't do no good, so you put it   away!"
3460 DATA 9,13,18
3470 REM Icon places
3480 DATA 34,190,34,284,98,368,274,368,468,368,532,238
3490 REM What objects in which rooms
3500 DATA 0,0,0,0,0,6,10,0,0,0,12,0,0,0,1,0,11,0,0,7,2,0,0,8
3510 REM Icon Character Places
3520 DATA 4,15,196,4,9,180,8,4,184,19,4,192,31,4,188,35,12,242
```

Programming: Commodore 64

Toolkit

by Lermineau Rudy

Part three of Toolkit follows. Remember that all the commands have to be prefixed by @ else a syntax review will result.

Loff returns the *List* command to normal.

Dump lists all the names of the active variables.

Rev makes all *Rem* statements appear in inverse field.

Beep results in a beep sounding every-time a key is pressed.

Boff turns the beeping off.

Name lists all the new commands.

Keoff turns the function keys off.

Keys displays the function keys.

List obviously lists a program. Pressing *Shift* temporarily halts a program while *Ctrol* slows it down. The speed can be altered by entering *Poke 766, 1-255.*

```
260 DATA 200,232,208,244,140,35,202,173,34,202,24,101,1795
261 DATA 122,133,122,165,123,105,0,133,123,32,107,202,1367
262 DATA 157,0,2,240,3,232,208,245,138,24,105,5,1359
263 DATA 133,11,173,2,3,141,32,202,173,3,3,141,1017
264 DATA 33,202,169,129,141,2,3,169,203,141,3,3,1198
265 DATA 164,11,76,164,164,173,32,202,141,2,3,173,1305
266 DATA 33,202,141,3,3,206,35,202,173,35,202,24,1259
267 DATA 109,28,202,133,122,173,29,202,105,0,133,123,1359
268 DATA 32,115,0,201,44,240,3,76,148,202,76,204,1341
269 DATA 202,32,142,166,173,24,202,133,99,173,25,202,1573
270 DATA 133,98,32,107,202,32,107,202,208,65,169,157,1512
271 DATA 32,210,255,169,32,32,210,255,169,0,160,202,1726
272 DATA 32,30,171,165,21,166,20,32,205,189,169,11,1211
273 DATA 160,202,32,30,171,173,30,202,133,251,173,31,1588
274 DATA 202,133,252,160,1,177,251,170,200,177,251,32,2006
275 DATA 205,189,169,13,32,210,255,169,255,133,99,133,1862
276 DATA 98,48,14,32,107,202,197,20,208,16,32,107,1081
277 DATA 202,197,21,208,12,162,144,56,32,73,188,76,1371
278 DATA 223,189,32,107,202,165,99,24,109,26,202,133,1511
279 DATA 99,165,98,109,27,202,133,98,32,107,202,208,1480
280 DATA 251,240,135,160,0,132,251,160,8,132,252,160,1881
281 DATA 0,177,251,201,143,208,11,200,177,251,201,58,1878
282 DATA 240,4,169,18,145,251,230,251,165,251,208,2,1934
283 DATA 230,252,197,45,208,225,165,252,197,46,208,219,2244
284 DATA 76,116,164,160,0,185,14,192,153,115,0,200,1375
285 DATA 192,6,208,245,169,31,141,50,3,169,199,141,1554
286 DATA 51,3,169,237,160,201,32,30,171,160,0,169,1383
287 DATA 0,133,251,169,206,133,252,169,0,145,251,230,1939
288 DATA 251,165,251,208,2,230,252,201,255,208,240,165,2428
289 DATA 252,201,207,208,234,76,116,164,18,60,60,32,1628
290 DATA 70,85,78,67,84,73,79,78,32,75,69,89,879
291 DATA 83,32,62,62,146,0,86,69,82,73,70,89,854
292 DATA 32,76,73,78,69,32,79,85,77,66,69,82,817
293 DATA 32,69,78,84,69,82,69,68,32,33,0,64,680
294 DATA 68,69,76,0,78,69,87,32,67,79,77,77,779
295 DATA 65,78,68,83,13,0,13,69,78,68,32,79,646
296 DATA 70,32,76,73,83,84,46,0,86,65,82,70,770
297 DATA 65,66,76,69,32,76,73,83,84,0,66,89,779
298 DATA 32,76,69,82,77,73,78,69,65,85,32,82,820
299 DATA 85,68,89,13,13,0,169,52,141,143,2,169,944
300 DATA 205,141,144,2,76,116,164,169,72,141,143,2,1375
301 DATA 169,235,141,144,2,76,116,164,72,169,15,141,1444
302 DATA 24,212,169,9,141,5,212,169,81,141,1,212,1376
303 DATA 169,97,141,0,212,169,33,141,4,212,169,50,1397
304 DATA 133,251,133,252,198,252,208,252,198,251,208,246,2592
305 DATA 169,0,141,4,212,141,5,212,141,6,212,104,1347
306 DATA 76,72,235,84,82,79,78,0,251,192,84,82,1315
307 DATA 79,70,0,238,192,68,85,77,80,0,127,197,1213
308 DATA 68,69,76,0,171,195,0,79,76,68,0,201,1003
309 DATA 193,0,75,69,79,78,0,168,194,75,79,70,1080
310 DATA 70,0,153,194,75,69,89,83,0,17,197,78,1025
311 DATA 85,77,0,156,201,0,78,65,77,69,0,151,959
312 DATA 192,72,69,88,0,65,195,0,76,73,83,84,997
313 DATA 0,218,198,76,79,70,70,0,231,198,83,82,1305
314 DATA 67,72,0,19,194,77,82,71,69,0,61,201,913
315 DATA 65,85,84,79,0,183,194,83,84,79,89,0,1016
316 DATA 215,194,82,69,86,0,51,204,0,66,69,69,1105
317 DATA 80,0,26,205,66,79,70,70,0,39,205,160,1000
318 DATA 160,160,160,160,32,58,32,0,0,0,0,0,762
READY.
```

Binary function

Wolfgang Sirges

This function for the QL returns a string representing the binary value of a number in the range 0 to 255.

For example, *Print Bin$(35) = "00100011"*.

```
200 DEFine FuNction bin$(x)
210 LOCal b$,y
220 b$=""
230 FOR y=7 TO 0 STEP -1
240 IF (x && (2^y))=2^y THEN
250 b$=b$ & "1"
260 ELSE
270 b$=b$ & "0"
280 END IF
290 END FOR y
300 RETurn b$
310 END DEFine
```

Factorials

Wolfgang Sirges

This function for the QL returns the factorial of a positive whole number. The range covered is 0 to 300 and if a value of zero is returned an error has occurred.

For example, *Print Fak(12) = 4.790016E8*.

```
100 DEFine FuNction fak (n)
110 LOCal a,x
120 IF n<0 OR (n-INT(n))<>0 THEN
130 a=0
140 ELSE
150 IF n=0 OR n=1:a=1
160 IF n>=2 THEN
170 a=1
180 FOR x=2 TO n
190 a=a*x
200 END FOR x
210 END IF
220 END IF
230 RETurn a
240 END DEFine
```

Cursor Move

A Wright

This routine for the Commodore 64 gives it a *Print At* command instead of having to use the usual clumsy control characters.

The syntax for the command, and the machine code is relocatable, is *Sys 49152,x,y* where *x* and *y* are the screen co-ordinates.

```
1 DATA32,29,192,201,40,144,3,76
2 DATA72,178,72,32,29,192,201,25
3 DATA144,3,76,72,178,24,170,104
4 DATA168,32,240,255,96,32,253,174
5 DATA32,138,173,32,247,183,165,20
6 DATA164,21,96
10 CM=49152:CK=0:FOR A=CM TO 49194
20 READ D:POKE A,D:CK=CK+D:NEXT A
30 IF CK<>4810 THENPRINT "ERROR":STOP
40 SYS CM,7,20:PRINT"INSTALLED"

READY.
```

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with Kenn Garroch

Overheating on the BBC

Tim Verschoyle, of Tolworth, Surrey, writes:

Q I own a BBC and have a disc drive that powers off the BBC's own internal power supply. I'm adding a Solidisk 2MHz memory expansion board and I've heard that this could give problems of overheating.

Will it be necessary to buy a separate power supply for the drive or will this combination be OK?

A The BBC has a switched mode power supply which should not really overheat. The temperature problems with the BBC are due to the fact that many of the chips run hot. If you start putting expansions inside the case, things can sometimes get a little too much. Your combination shouldn't put too much strain on the existing power supply but, if you are thinking of attaching more gadgets in the future, you will have to get a separate power supply for the disc drive; there is a limit on how much power the system can cope with.

As it stands, however, you will just need to make sure that you don't stand anything on the lid, and you should be all right.

Atari or Commodore?

Paul Macdonald, of London N3, writes:

Q I want to buy a home computer both for games and word processors and for me, the choice would be between the Atari XL/XE and the Commodore 64.

I would like to know which is the best machine for my purposes. Which one has the best graphics, the best sound? Which is the best games player, the best word processor, the best all round machine?

I know that there is not as much software available for the Atari in the UK as there is for the Commodore 64 but, is the quality good enough to make up for that?

I would also like to know whether I can connect either or both machines to a colour TV with RGB, and would I need any special interfaces to connect them to a modem?

What other problems am I likely to meet when it comes to expanding my system? Is it true that the Commodore disc drive is very slow and if I used a disc turbo or something, would I have loading problems?

A Between the two, I'd choose the Commodore, purely on the grounds that there is so much more software available for it. In some ways, the Atari sound and graphics are superior but I don't think the difference is enough to make up for the lack of software.

The other advantage of the Commodore is the support it gets from magazines and third party manufacturers. There are a lot of tips published for it, and a great number of add-ons made.

As far as I know, neither the Atari, nor the Commodore can be used with RGB. The 64 puts out semi composite video (separate colour and picture signals). I'm not absolutely certain about the Atari but, I think it is similar.

You can get modems for both machines which attach directly so, in one sense, there is no need for special interfaces. On the other hand, you would not be able to use a standard modem without some kind of RS232 interface. It's better to go for a package that has everything included.

Both the Atari and Commodore disc drives are a little on the slow side with the 1541 (Commodore) being possibly the slowest drive ever. However, most games come with their own fast loader so it's not too noticeable. Any turbo loader you might buy would be redundant with most commercial software because of this.

With both Atari and Commodore systems, you are pretty well confined to upgrading using the particular manufacturer's own systems. This is due to the fact that the interfaces on both machines are non-standard but, if you are willing to pay, you can get almost any peripheral you may require.

Learner driver

Kevin Oxland, of Tiverton, in Devon, writes:

Q I have just read your bit on interrupts in the December 11 issue and was very pleased because I was having the same problem.

I am afraid I have another one for you. When you switch in the Ram, you have 60K available to you, plus you have to write your own driver routines. Is it possible to use the joystick in this state? I have tried but got no response.

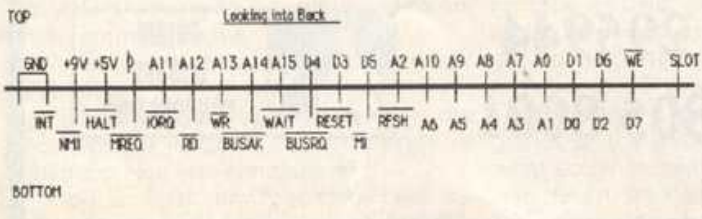
A You should have no trouble reading the joystick since all the I/O section of memory ($D000–$E000) is left in. You should be peeking 56320 or 56321 ($DC00, $DC01) for the rear and front joysticks respectively. What you may have done is upset the data direction registers in CIA I. Location 56322 (DDRA) should be set to 0 for input if you are using joystick port 2, and 56323 (DDRB) should be 0 for joystick 1 input. You can set these up in the *Setup* routine of the listing given in *Popular* December 11, page 39.

Manual operation

F Hanson, of Leominster, in Herefordshire, writes:

Q I recently picked up a Jupiter Ace computer at a jumble sale and I would like to use it for controlling the lights and central heating. What I don't know are the edge connections at the back since I don't have the manual. Could you tell me what they are and perhaps give me a hint as to where I might get the manual?

A The I/O (input/output) on the Ace is very similar to that of the Spectrum in fact it is almost identical to the ZX-81. I don't know where you will get a manual since, correct me if I am wrong, Jupiter Cantab Ltd no longer exists. In any case, the I/O connections are shown below.



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This toolkit also contains lots of new graphics commands, all of which have the ability to draw using user defined patterns, not just solid lines. There is even a new fill command that will fill any shape with any user defined pattern (features like these are normally only to be found in the most expensive of drawing programs). We even throw in a special pattern designer so that you can design your own new patterns at leisure.

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New releases

John Cook looks through this week's new arrivals

Amstrad CPC

Program *Database Manager (AtLast)* **Type** Application **Micro** Amstrad CPC 6128 **Price** £29.95 (disc only) **Supplier** Advance Software, 17 Staple Tye, Harlow, Essex CM18 7LX.

Program *Xevious* **Type** Arcade **Micro** Amstrad CPC **Price** £9.99 (tape) £14.99 (disc) **Supplier** US Gold, 2/3 Holford Way, Holford, Birmingham B6 7AX.

Arcade conversion from the quite famous Atari coin-op. Probe Software has done a workmanlike job which should be faithful enough for the devotees – but requires more like relentless determination rather than ace, super-fast reactions.

Program *Bomb Jack II* **Type** Arcade **Micro** Amstrad CPC **Price** £8.95 (tape) £14.95 (disc) **Supplier** Elite Systems, Anchor House, Anchor Road, Aldridge, Walsall, West Midlands WS9 8PW.

Disappointing follow-up to the excellent original *Bomb Jack*. You may be warped enough to enjoy playing it, but don't go out and buy it on the name alone.

Amstrad PCW

Program *Database Manager (AtLast)* **Type** Application **Micro** Amstrad PCW 8256/8512 **Price** £29.95 **Supplier** Advance Software, 17 Staple Tye, Harlow, Essex CM18 7LX.

C16/Plus 4

Program *Bounder/Planet Search* **Type** Arcade **Micro** C16/Plus 4 **Price** £6.95 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS.

Reasonable conversion of *Bounder*, plus an excellent little *Defender* clone on the other side – good value.

Program *Molecule Man* **Type** Arcade Adventure **Micro** C16/Plus 4 **Price** £1.99 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

Side on, *Knight Lore* style graphics, with a maze designer on the flip side. You can't say you're not getting your money's worth with this one.

Program *Fighting Warrior* **Type** Arcade **Micro** C16/Plus 4 **Price** £7.95 **Supplier** Melbourne House, 60 High Street, Hampton Wick, Kingston Upon Thames, Surrey KT1 4DB.

Now that the season of goodwill has past, let's get into some serious violence, with yet another martial arts bash – this time for the C16. Thwack away at assorted weeblies with huge double handed swords. You know it makes sense.

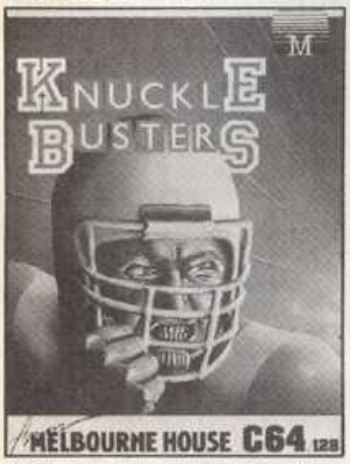
Commodore 64

Program *Footballer of the Year* **Type** Strategy **Micro** Commodore 64 **Price** £9.95

Supplier Gremlin Graphics, Alpha House, 10 Carver Street, London S1 4FS.

We already mentioned the Spectrum version a couple of weeks ago, now here's the Commodore – and it's bad. Out of duty, it was played through six seasons . . . we got to be Footballer of the Year four times, and one time won the UEFA Cup and the League Cup, plus the League and FA Cup double (played, incidentally, between Oldham and, errr . . . Oldham). Even Jimmy Greaves could spot something wrong with that.

Program *Knucklebusters* **Type** Arcade **Micro** Commodore 64 **Price** £9.95 **Supplier** Melbourne House, 60 High Street, Hampton Wick, Kingston Upon Thames, Surrey KT1 4DB.



Reads inlay card. "You're a wanted man. You've just busted out of the lobotomy labs . . ." Oh yeah?

Knucklebusters is a game with super-smooth scrolling, great music – and almost nothing else. Melbourne House needs a hit badly to regain its reputation as one of the forerunners in the software market. This isn't it.

Program *Bomb Jack II* **Type** Arcade **Micro** Commodore 64 **Price** £9.95 (tape) £14.95 (disc) **Supplier** Elite Systems, Anchor House, Anchor Road, Aldridge, Walsall, West Midlands WS9 8PW.

Program *Battalion Commander* **Type** Simulation **Micro** Commodore 64 **Price** £9.95 (tape) £14.95 (disc) **Supplier** US Gold, 2/3 Holford Way, Holford, Birmingham B6 7AX.

SSI (Strategic Simulations Inc) is comprised of a bunch of wonderful human beings. What have I been waiting for since the dawning of time?

Correct – a real-time tactical level wargame. And here it is, *Battalion Commander*, released through US Gold in the UK. At first sight, it looks amazing (I'm talking about the system here, not the graphics . . . as far as they are concerned, I hope you like green). Realistic command structure. Full hidden movement and line-of-sight rules. Supply, morale, fatigue – slobber, slobber, drool. What more could a computer wargamer want?

Single player, company/platoon level scale, we'll give you a full report next week.

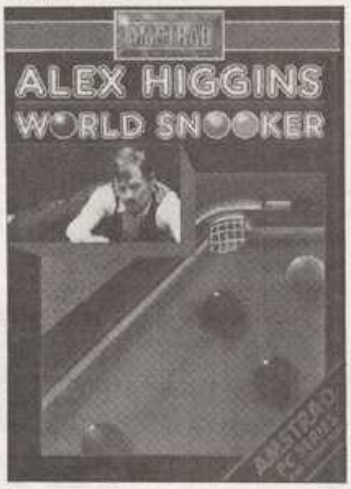
BBC B/Electron

Program *Pieces of Eight* **Type** Spook Adventure **Micro** BBC B **Price** £4.50 (mail order only) **Supplier** Elf Software, 14 Cornwall Road, Rishton, Blackburn, Lancs BB1 4DB.

Text adventure involving some kind of send up of Treasure Island. Remove 15 men/examine chest/drink rum, etc.

PC Compatibles

Program *Alex Higgins Snooker* **Type** Arcade **Micro** PC and Compatibles **Price** £19.95 **Supplier** Amstrad, Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF.



Alex Higgins PC (People's Champion) takes on the Amstrad PC.

Pick of the week

Super Bowl

Program *Hyperbowl* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

I once heard an overstressed executive state in a press conference – "I think people are getting tired of impressive graphics and music." In the context he was using it, it was a painful snippet of PR speak, but it is worth remembering that games can be worthwhile without the trimmings we've all come to know and love. *Hyperbowl* is one of these.

Graphics reminiscent of *Asteroids* and minimal sound, but it's a wonderful little budget title.

Playing either against the computer or a companion, you pilot a spacecraft starting off in the middle of an oblong playing area with the aim of propelling a puck to the opposite end (you do this either by firing at or bumping into it). Hugely playable (particularly with two players), at £1.99 it's a steal.

Program *Cyrus II* **Type** Strategy **Micro** PC and Compatibles **Price** £19.95 **Supplier** Amstrad, Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF.

Program *Supercalc 3.1* **Type** Spreadsheet **Micro** PC and Compatibles **Price** £69.95 **Supplier** Amstrad, Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF.

Program *Electric Studio Light Pen* **Type** Utility **Micro** Amstrad 1512 **Price** £19.95 **Supplier** Software Marketing Ltd, PO Box 14, Letchworth Garden City, Hertfordshire SG7 6TZ.

A hardware package including installation software. Amongst other things, this'll let you draw freehand masterpieces under *GemPaint* and *GemDraw*. Given the usual provisos re light pens, it looks pretty good.

QL

Program *Microdrive Controller* **Type** Utility **Micro** QL **Price** £9.95 **Supplier** Microsystems, PO Box 24, Hitchin, Herts.

Program *Garden Flowers Module* **Type** Application **Micro** QL **Price** £11.95 (or £10 as an upgrade) **Supplier** Superplant Software, Llangeltho, Tregaron, Dyfed, Wales SY25 6QG.

Latest in an *Archive* based system or QL gardeners. This will give you all the facts about common bedding plants, whereas the collection of 5 modules (this will cost you £39) will mean you'll never have to listen to Gardeners' Question Time ever again.

Spectrum

Program *Agent X* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

Multi-load arcade adventure action. And it happens to be the cheapest way to save the Earth going.

Program *Xcel* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

Mindless zapping with some cryptology thrown in. What a combination.

Program *Ninja* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

Program *Masters of the Universe* **Type** Arcade **Micro** Spectrum **Price** £9.95 **Supplier** US Gold, 2/3 Holford Way, Holford, Birmingham B6 7AX.

Masters of the Universe is a cartoon for young kids in which the main character is called He-Man, and is pretty dire all round. US Gold has retained both these features in the arcade game.

Catering for one's needs

Recently (Ziggurat, November 27), the question of the hidden costs involved in computing was raised. This started the crystallisation of some thoughts that had been mobilising themselves in my mind for some time now.

As a psychologist, I find myself very interested in what motivates people to do certain things. As a regular reader of computer magazines, I have been fascinated to watch the media 'hype' surrounding the launch of home computers such as the Atari ST, Amiga and IBM compatibles.

The companies' advertising tells us of the succession of new models, each bigger and better than the last, the increasing sizes of Ram, the new operating system 'environments', the upgrades possible and, most recently, the advent of the hard disc in the home computer price range.

However, I wonder how many computer enthusiasts actually take a long cool look at their real requirements before reaching for the credit card and rushing to town to collect the next piece of electronic wizardry from the shelves of the shops.

Finding myself secretly lusting to 'upgrade' to the BBC Master lately, I took myself in hand and asked myself a few logical questions. Unfortunately, the logical answers convinced me that there were far more sensible (and essential!) things that could be done for the same amount of money. They further convinced me that I had allowed myself to be 'conned' by the media hype into thinking that I was somehow inadequate because I was actually satisfied with the system I presently use.

It has taken me three or four years to build up a BBC B based system with disc drives, printer and a respectable collection of software including *Wordwise Plus* and *Inter-Word*. Indeed, the word processing facility is now the entire raison d'etre for having the system. The advertising drives of the major computing companies campaign to convince me that I need at least 512K of useable memory to be a 'serious user'. The Master's 128K is treated almost as a nudge-and-a-wink joke; ribald laughter would greet anyone daring to suggest they would even touch a machine with 32K memory.

But, *hold everything!* I think I'm a reasonably typical example of the British public. At home I use my computer system regularly for almost all my correspondence, I write a few articles now and again and for fun I enjoy zapping a few aliens or bending my brain round an adventure or two; at work I use a small data-base and word-process a page or two with an almost identical system. I can log on to national databases via a modem and test run a lot of educational software. I cannot once remember coming across memory limitation as a frustration to what I wanted to do (although I must confess to coming very close once in using the database, until I moved to a Rom-based system).

So, what would I do with the other 480K of memory that people are trying to convince me I need? I would have a mouse to play with and could do everything with icon-driven window graphics. Unfortunately, my 'serious' uses for my computer system demand that I use the keyboard as no-one has yet replaced that (though I suspect they may not be far off).

It fascinates me to think who is buying the new 'heavy brigade' of personal computers. A deeper question might be, who needs them? What is happening to the population's discarded and totally inadequate (or so we are told) early computers? There must be a saturation point for the market for personal computers and a limit when the public realise that they don't actually need a more powerful, bigger memory, all singing, all dancing, icon driven, double disc, dedicated word processing, 16,384 colour, high resolution work station (with resident family of mice!).

Maybe the recent rumblings in the computer business world are signs that the public are beginning to feel misled. Presumably by that time, however, Alan Sugar will be in the snow selling market in the Arctic and Sam Tramiel, the coal shipping to Newcastle business!

K P Dutton

NEXT WEEK

Beginner's Guide to Computing

Next week sees the start of a four part series on learning to program and using your micro to the full.

We'll be telling you about the principles of programming in Basic using graphics and sound in your own programs, and looking at other popular computing languages.

We'll discuss what you can use your computer for, other than zapping aliens; about disc drives, printers and other add-ons and what they're good for; and expanding your horizons in the field of communications.

Chess Board

Martin Bryant's Chess column is back next week, and the *Popular* vs *Colossus* tournament returns.

Win Brian Clough...

...or his football game, at least. We'll have an easy-to-enter competition with copies of *Brian Clough's Football Fortunes* up for grabs.

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