

POPULAR Computing WEEKLY

Atari plans research facility in Europe

Details on page 6

Superbase for the Atari ST

Communicating on your PCW

The rise and rise of computer fraud



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**SPECIAL
supplement**

THE QL

Desktop publishing

Graphics



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For database programs such as the Superbase Personal shown in the PCW review, Roland's 400 series and other Amstrad/Personal titles will benefit from mouse control.



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In defence of the small dealer

In reply to your correspondent D W Stratton in the April 10 issue, I would like to offer a contrasting set of experiences. First of all I will admit to being a very basic user of the Commodore 64 and a regular reader of your magazine. This, perhaps, is what saved me from making the same mistakes to do.

Like Mr Stratton, I started the year with a resolve to upgrade to a 16-bit machine, and as there seemed to be only one at an affordable, publishable price, it also decided on the Amiga 500/1.

I spoke to Olexa Shop, asking what I thought were simple questions about such matters as the voltage of the power supply, if I've already had to repair the C64 PSU once, and if it's on the way out again; the frame and scan rates of the monochrome monitor, and whether the RGB output was TTL or linear. The person I spoke to didn't know. I got to the Atari Helpdesk. Nobody there knew either.

In desperation I spoke to a South East London dealer. He never, whereas a service manual was opened and all its questions were answered. I was also told the answers to all Mr Stratton's questions, such as just what was bundled with the machine and the prices of all the third party disc drives, etc. I was given such a good picture that I decided not to buy yet - still waiting for the Amiga/ST battle to sort itself out a bit more. I do buy an Atari II now when time.

I suppose the moral is the old one of let the buyer beware, and let him choose a good dealer.

F McClelland
London SE70

No printer problems here

I refer to Karen Garroch's reply to W L Pophore in April 10 issue of Popple.

I have had experience with a number of QL and printer setups and can report that with Epson and compatible printers (eg. Shinwa CP80 and clones) there is generally no problem in running at 9600 baud if using the serial link. The most recent problems I find arise whilst attempting to configure Gull

and the other Pison programs to run with a specific printer.

The Brother M7 509 used by Mr Pritchard seems to be a different type of font, one of my friends recently purchased one and could not get it to work at all. The problem was resolved by making up a special cable which, I believe, had pins 4, 5, 6 and 7 linked together. This information should be checked with Brother, which my friend found most helpful. It could be Mr Pritchard has a handwriting problem if one of these lines is not connected.

The printers I have dealt with have never required those connections to make them work and I suspect a large number of printer cables sold do not incorporate them.

Tim Cox
Dunstable

Escaping from the Organiser

With reference to the Pison Organiser program, Exchange, which you published in Popple, April 2.

The program as listed will form an endless loop when run, which could be rather frustrating for a beginner, who may not know how to escape.

The solution is to add a Quit option to the menu on line five and tap the following line on to the end of the program, just before the ENDP statement.

0 0000 210F

Mike O'Regan
IPSO group

Long live the Stone Age

I would like to present my response to Garwood to the cassette! (Ziggurat, April 11-83).

I have owned a 68K Spectrum and cassette recorder for four years, and during that time, I have only lost two cassettes - not bad for a "primitive" system!

In October last year, I decided to 'upgrade' to a disc system, after being 'enlightened' by speed, reliability, convenience, etc.

During the six weeks that followed, I had two drives, both of which were sent back twice for a total of three weeks, programs mysteriously wiped out, valid disc commands rejected, discs formatted when I tried to

start a program, and only two programs which saved properly.

Not surprisingly, I decided to get a refund - reliability and convenience being replaced with availability and convenience!

Disc drives and discs may not be that expensive, but, for the Spectrum at least, they're about five times more expensive than cassette recorders and cassettes.

The ST and Amiga are in the business/lower home sector of the market, so who would expect them to have a cassette interface?

Last week I bought a Spectrum 128, and unless Amstrad produces a very reliable, cheap disc upgrade for compatibility with the Plus 2, I would rather wait 15 minutes for a program to load than face a possible disc drive style fiasco.

Finally, Mr Shepherd, I am not, as your article would suggest, a crazy person using a primitive cluster manufactured by a madman, but somebody who has had experience of both cassettes and discs and finds cassettes more.

David Smith
Preston

Forum for discussion

I would be grateful if you could mention a magazine on cartridge for the QL.

It is called Forum, and issue two is available by sending 50p, a stamped addressed envelope and a blank formatted cartridge to Ian Bunker at 25 The Broadway, High Street, Sandford SP4 8LP.

Ian R Bunker
Sandford

The vanishing disc drive

The special feature on computer rights (April 11) will have been of interest to many readers, although it gave the impression that most problems are encountered with small computer shops and retail order outlets.

My major headache concerns a high street store better known for selling aspirin than computers.

Last summer I bought a Micro Peripherals disc drive and interface for my QL. After three months of moderate use the

interface developed a fault, so I returned it to a branch of the supplier.

Over three and a half months later the unit was returned (first the interface, then the disc drive a week later) in a more condition than when it was taken in for repair. The disc drive failed, and would no longer read my double sided discs.

The drive is now with the chain's head office. I have been without the use of it for four and a half months out of the last eight, and can still see no prospect of a refund or replacement. Surely this is totally unacceptable behaviour on the part of a national chain store?

Michael J Jackson
Barnet on Road

The Amiga vs Atari ST debate continues

I would be grateful if you could give me some advice on the Amiga 500 vs Atari ST debate. I have £200 to spend on one of them and require stunning graphics, great sound, and a huge amount of software to choose from.

Do the ST and Amiga 800 both have these attributes? Are they both good for playing games on? Will more software be written for them (ie, the QL died because of little interest from software houses)?

George McGuckin
Glasgow

Both the Amiga 500 and ST have graphic capabilities far superior to those on 8-bit machines. The sound chip in the Atari ST is the AY8910; while this is the same chip as in the Amstrad 484, for example, the sound potential on the ST are greater, thanks to its MIDI connections. The Amiga contains a custom sound chip and also has the option of stereo output.

Neither machine has a huge software base as yet. While the list of software available is growing for both machines, in the UK at least, the ST is ahead in this respect at the moment.

The machines are both "good" for playing games on, though you should bear in mind that games playing is not entirely what Commodore and Atari had in mind when designing them. Should you wish to turn to more business-oriented applications

later, both will be available.

We believe that software companies will continue to write in ever increasing numbers for the Amiga and ST. Most major houses already include at least the ST in their plans for future releases, and when the Amiga 500 becomes available in the shops later this year, it should be gradually included as well in companies' plans.

Repairing points

Having read your April 10 issue, I feel prompted to write regarding a couple of points.

Firstly, the item in News Desk regarding Amstrad, the BBC and the PC1512?

I am the computer department of a large high street store. We have a PC1512 with double drive and colour monitor in display.

This machine is on from 9.00am in the morning until 5.00pm (5.00pm on Thursdays) six days a week. It has never shown any sign of overheating and we have never had any problems with it (apart from when the clock batteries were flat).

All our customers who have purchased one from us have been satisfied and we have had no bad feedback from any of them.

Secondly, I would like to congratulate John Anderson (letter, April 15). This man has achieved the impossible! He has actually managed to get a phone call through to Verano!

"Tell me, how did you do it?" Every time I phone the line is engaged. On the rare occasions that I have got through, I too have come up against the "waiting for parts" for Commodore machines, and many of those returned to me repaired have gone faulty again shortly after.

Of course, the customer doesn't seem to realise that this is not my fault, so I bear the brunt of that temper.

On the whole though, I would like to say that the service from Verano is satisfactory and it is not all that often that I have to contact them.

One more point I would like to make is that Amstrad Computers are by far the most reliable machine at the moment. Since we started dealing with the Amstrad range, we have had none back from the PC20 and PC range, and of the CPCs, we only ever had one 128 monitor returned.

This was returned to Amstrad by us for repair, and to our surprise, a brand new monitor was delivered a week later. Surely that speaks for itself.

Name and address supplied

The battle of the computers

I am writing in regard to the test made by Alastair Watt in Letters, March 29. In his test Mr Watt stated that the Amstrad PC showed incredible savings for drawing and calculating on the screen. Well, I have done the same test with my Atari ST and GFA Basic and frankly I think the PC-612 is far from "charismatic" as Mr Watt would have you believe.

The time on my ST was 14.1 seconds. Timing for the Spectrum showed 112 seconds and for so-called famous Amstrad PC-60 seconds. In other words the ST was 28 times faster than the Spectrum and four times quicker than the PC. If you

consider the fact that Basic is perhaps the worst language to use on a 16-bit/32bit micro (in terms of speed that is), the results of Transit in saying that PCs are more than dated is logical.

The support Amstrad has had from the British press is unparalleled in any other country. And so it is not difficult to maintain a so-called monopoly in the British computer world.

But look, dear readers, at what kind of machines you have bought. Spectrums which are completely out of the top 10 in Europe (even MSX is outstripping them many times), CPC models which cost over 2 inch disks and with very expensive options to change monitors, but to rival them at those users who had to update from 48k to 64k to the 128k version to the PC20 "Jaguar".

I think it is time that British users come out of their "material" views of the computer industry and see what the rest of the world has to offer. MSX 2 is good and so are the Amiga and the ST. On the ST I have now five operating systems, GEM-TOOLS, CP/M, MS-DOS in soft, from Germany and far more compatible than the famous "translator", and OS-9.

I agree that you could stick with your old Spectry, but upgrading it for a PC is like selling a bike to use the local bus.

Now, why are there so many business people out there who stick with old MS-DOS? Well, it means they are businessmen with no knowledge on the subject. So they are buying local bus tickets for the price of a Jaguar. It's not their money of course. No, it's yours.

Danny Scorsone
Belgium

Forcing black's queen

The readers' latest move in Game Two of the Colossus chess tournament is to attack black's queen with their bishop, forcing Colossus to move his queen to e4.

Casting your vote

How would you continue the readers' attack? Send your suggestions now to either Inter-Mediate (P.O. Box 1396), Farnham, Surrey GU14 7PH, Herbs CM21 8YA (no stamp needed), or Popular Chess, Unit 2, The Millings, Dun-Edinburgh, Herbs CM21 0PD (with a stamp).

All entries must reach either address by Wednesday, May 15.

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

Prizes

A British Museum reproduction Arca chess set will go to the person suggesting the most accepted moves at the end of the game. Five copies of Colossus Chess II will go to the most consistent entrants.

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

Game Two

1	h2-e4	f7-e5
2	h2-h3	g8-f6
3	f2-e3	f8-e7
4	g3-f4	f7-e6
5	h3-g4	f6-g7
6	g4-f5	g7-f6
7	f5-g6	g6-f5
8	g6-f5	h7-g6
9	h2-h3	h7-g6
10	h3-g4	g6-f5
11	g4-f5	h6-g5
12	h2-h3	h6-g5
13	h3-g4	g5-f4
14	g4-f5	h5-g4
15	h2-h3	h4-g3
16	h3-g4	g3-f2
17	g4-f5	f2-e1
18	h2-h3	e1-d2
19	h3-g4	d2-c3
20	g4-f5	c3-b4



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

Last week, we printed the first round and order form for the Popular/Simmons Spectrum Micro Source offer. Here is the second and final round, you need to send for yours.

Popular/Simmons
Micro Source
special offer
Token No. 2

Atari plans research facility in Europe



The Atari 500 - part of Transil's push into specialist technology

ATARI chairman Jack Transil has plans to set up a "software centre" in the UK later this year.

This is expected to be an advanced software development unit, along the lines of Sinclair Research's Minsk, set up in 1984 to research into hardware technology.

Transil is believed to be in negotiation with programming

teams to staff the unit, apparently the decision has been taken to place the software centre in the UK, due to the programming expertise in this country. While in the UK for the recent Atari show, he is reported to have said, "I can smell the success here".

While it is thought that the research centre will be looking

at FISC (Fused Intrinsic Set Chip) technology, no details have been released yet.

Atari is also considering setting up a research and development centre in West Germany, which will concentrate more on hardware innovations, and a computer manufacturing plant in North America. The Atari range of micros is currently manufactured in Taiwan.

Jack Transil: "I can smell the success here"



Correction

LAST week, we printed a picture on page 13 which we claimed was John Spoker of Microsoft.

In fact, it was a doctored file, since it was Ray Evans of Origin/Microprose. The real John Spoker is pictured below.



Amiga 500 on show to over 18s only

Commodore has confirmed that it will launch the Amiga 500 to the public at the Commodore show, starting on June 12.

However, the machine will be displayed in the Commodore Business and Amiga Expo stalls, which is only open to those over 18 years old.

The stall is an area which will specialise in new Amiga products for serious home and business use.

Camel Eprom blower now from Alphacam

CAMEL Products' Eprom blower (Bogram-PS) is now available from Alphacam.

Bogram-PS connects to any micro with an F5000 with PYS,DPH and CTS hardware lines.



Bogram-PS costs £188.85 from Alphacam, and is available for the IBM PC, BBC, QL and Spectrum micros. The price includes a cable and disc instructions for QLs.

Details from Alphacam at The Old Millings, 125/6 Great Walk, Cambridge CB2 3QJ, 0223 214214.

Digital Research moves away from mass market

DIGITAL Research is to move away from the mainstream operating system market, and will be concentrating on vertical markets and multi-user applications, particularly with its Corecurrent DOS 288 system.

However, DR's UK vice president Paul Bailey said that this move would make no difference to work on Gem, the DR operating system packaged with the Atari ST and Amstrad PC1512 machines, among others.

"We have three main markets," he said. "Multi-user micros, specialist industrial auto-

mation and graphics systems on DOS. We are totally committed to all three, although the main focus is on the multi-user markets.

"Gem is absolutely strategic to us, for example, when Atari brings out its new PC in August (see Popular Computing Weekly, May 7), there will be Gem Desktop, Gem Fax, and Gem Write-in it."

Bailey also affirmed his support for Amstrad, should Amstrad bring out further versions of its PC compatibles later this year as expected.

New micros for Flash Gordon

MASTERTRONIC is converting its Commodore 64 to Flash Gordon to the Spectrum, Amstrad CPC, MSX and Atari 500 machines. The program will be available in June at Mastertronic's MAD range price of £2.95.

Activision and Codemasters in Grand Prix row

A ROW is brewing between budget newcomers Codemasters and American-owned Activision over a recent Codemasters release, *Grand Prix Simulator*.

It is alleged similarities between that and the company Super Sprint, recently released by Activision, which is causing the dispute.

Events started with Activision contacting Codemasters, alleging that *Grand Prix Simulator* - already a best selling title on the CPC - infringes its copyright and stating that unless the game was withdrawn from the market, a high Court injunction would be sought and damages claimed against projected loss of revenue.

Codemasters strongly denies the allegation and so far has refused to comply with Activision's demands.

Said Codemaster's David Darling: "They've both entered racing games, but with that restriction, no specific points are the same. I'm confident that if it got to court, we'd win."

To date, both companies have put the matter into the hands of their respective lawyers, and the dispute remains unresolved.

The battle could prove something of a test case. Previous disputes over licensing copyright have usually concentrated on specific sprite design and screen layout - certainly not the case between *GPS* and *Super Sprint*. If Activision wins on the premise that the general game concept is part of the licence, the implications are enormous.

At the time of going to press, representatives from Activision were unavailable for comment.

New report cites harm from VDU exposure

THE most detailed report so far into the effects of VDUs on users was issued last week, and concludes that VDUs are harmful.

The report was commissioned by the council workers' union NALGO, and published by the VDU Workers' Rights Campaign. It examined the effects of VDU use on 3,000 employees of the London Council of Heatham, and found some startling conclusions.

Most reports of this nature have proved inconclusive. However, in the NALGO report more than three-quarters of those users who were interviewed complained of blurred vision and painful eyes. Psychological and social effects such as depression were common, particularly among women.

Further problems, such as stress, are caused by computer breakdowns and printer noise.

In other countries, for example Sweden, Norway and West Germany, VDU users are protected by statutory health and safety legislation. But in the UK there is no such legislation, only employer-specific agreements.

"We can't understand the reluctance to have VDUs built in to current standards. It's vitally important that they are," said campaign worker Irene Hamilton.

Hamilton wants to see all VDUs shielded against electromagnetic radiation at the point of manufacture.

"And all equipment should come with an anti-glare screen and a detachable keyboard," she went on.

The report is available from the VDU Workers' Rights Campaign, City Centre Project, 32-35 Featherstone Street, London EC1.

SOFTWARE HOTLINES



Distinctions - quite a sensible name for a new games compilation for the PC, from veteran **Design Design** which, believe it or not, has been around now since early 1982.

The compilation contains conversions of *Prop* of its recent releases, *MCBOR*, *On The Run* and *2112AD* which, **Design Design** say, covers all the ground between shoot-'em-ups and problem-solvers that should "satisfy even the Marsee needs". Err, lads, if you had a Marsee need, would you buy a PC?!

Another sensible name, **Sensible Software**, whose previous efforts include *Genocide* and *Paxifax*.

Sensible is an Essex based programming duo consisting of Jon Hale and Chris Yates who have just written a great little game for Cusan, called *What?!* (aka *What?!* *What?!* *What?!*) in which you play the part of a wizard and his cat. What has happened is that an evil mouse has stolen all the columns out of the eight levels of the game, a situation you must rectify.

As you might guess from the title of the game, there's quite a bit of boardy/bourney involved, as your wizard is unstable like for the most of the time, but there's one half of a lot of shooting as well, with an extra-gowers thing entirely inspired by *Harvest*.

et al.

The vital extra power to get in the cat which appears as a smaller ball, following you around - but under independent control when the fire button is depressed. It's with the cat that you have to collect the drops of paint that fall to the ground when you zap certain blobs.

Out at the end of May on Commodore, Spectrum and probably Amstrad, too, it's well worth a look.

But, let's face it, there are times when nothing but a bit of gratuitous violence will do, so why not load up *Prohibition*, from **Inferno**.

On ST now, with 8-bit versions following, you are faced with the host of a building, around which you shoo-fly scull, blowing away gangsters that appear at windows, under drain covers, etc. Failure to do this within a strict time limit will result in your confinement. Good stuff.

Hey! Licensing deal of the year, the kids will love it, but sales will not hold a candle to the sales and it could be the saving of the whole of Argus Press Software - from **Quick-silver**, **The Tube**.

But wait. No Pauls, no Joels. It's a shooter. SSS, if only they can get *Tyco Toys* to ban it, who knows...?

John Cook



DIARY
DATES

MAY

8-10 May

**The Electron & BBC Micro
Bazaar Show**

New Hall, London

Details: Software, hardware and peripherals for Acorn's micros**Price:** £3 adult, £2 children, £1 discount for advance booking**Organiser:** Database Exhibitions, 061-456-8636

JUNE

12-14 June

Commodore Show

Naxos, Hampton

Details: First public showing of

4800 and 4850 Amigas

Price: £3 adult, £2 children**Organiser:** Database Exhibitions, 061-456-2991

30 June-2 July

PC Bazaar Show

Olympia, London

Details: Hardware and software for all users of IBM PCs and compatibles**Price:** £5**Organiser:** EMAP International Exhibitions 01-895-1101

JULY

10-12 July

Amstrad Computer Show

Alexandra Palace Pavilion, London

Details: Displays and demonstrations of all latest hardware, software and peripherals for Amstrad computers**Price:** £3 adult, £2 children, £1 discount for advance booking**Organiser:** Database Exhibitions, 061-456-8636

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

Off the Hook follow-up
tape to aid NSPCC

A CHARITY tape to aid of the NSPCC is to be launched this summer, "probably in June".

The organisation behind the publication of the tape is being co-ordinated by Paul Coopers of Advertiser, as it follows up to previous ventures, *SoftAd* and *Off the Hook*.

"The compilation is in the final stages of assembly," said Coopers. "It will include *Amo* by Argon Press, *Digital's Night Gazer*, *Realtime's Starzike*

(1), and *Dream's Morry* on the list, so far, and there will be lots more in it.

The compilation has been put together in conjunction with the NSPCC, which has donated packaging, and will sell the tape in its own stores. It will also be available in normal computer outlets. The compilation will be available for Spectrum, Commodore and Amstrad machines, and full details will be available in the next couple of weeks.

So far, the software industry has raised more than £20,000 for the NSPCC, mainly from its *Off the Hook* last December. But Coopers says that about 10% of the money pledged by companies has still not been paid.

"I hope that we'll raise more than £700,000 for the NSPCC," said Paul Coopers. "That will make it the third year running that we've raised over £200,000 for charity, after *SoftAd* and *Off the Hook*."

IGS word
processor
out in UK

MGA Microsystems, is selling *Graphcenter* for the Apple II/5 from Californian company Graph.

Graphcenter is a page layout program, incorporating word processing and drawing functions, an mouse controlled. *Graph* can also be ported over from other programs such as *Parsonske Plus*.

Graphcenter costs £149.45 inclusive. Details from MGA Microsystems, 140 High Street, Tonbridge, Kent TN10 5HT, 05806 4276.

Audiogenic needs
programmers

AUDIOGENIC, admitting that it is no longer in the top ten of software companies, is starting a recruitment drive for programmers.

The company is offering an Amiga 500 to any programmer it takes on whose program then makes the top ten in the Gallup software charts. An Amiga 2500 goes to any programmer whose product makes it to number one.

Audiogenic can be contacted at 11 Children Enterprise Centre, Station Road, Thatch, Berkshire, BT24 3DQ60.

Silent Service banned
in West Germany

The simulation game *Silent Service*, by Micropress, has been banned from open sale in West Germany.

The ban comes under the Youth Dangerous Publications List legislation, apparently *Silent Service*, which simulates a World War II submarine operation is "too realistic".

The decision means that the game has been relegated to regulated outlets such as sex shops.

Micropress's president Bill

Steady plans to appeal against the ban.

Micropress has moved into the hardware market with the announcement of a second joint venture agreement with a US company.

Following last month's deal with Origin, Micropress has signed up with Suncom, to distribute a range of joysticks and peripherals, including monitors and accessories such as disc storage cases and printer stands.

Major Bill Steady of Micropress with some of the company's "controversial" products.



NEXT
WEEK

Load it

Help is at hand for all users of Commodore's CEM database recorder. Load II claims to solve alignment problems once and for all. Chris Jenkins checks it out.

Spectrum keyboards

Anthony Reid takes you through a DIY project to build your own Spectrum keyboard. If you're still suffering with the rubber keys, or down on your hands and knees picking up loose keys from the Spectrum Plus, this could be the article for you.

Software

Everything You Ever Wanted to Know about Graphics, the Universe and Everything on the Z88. Or... that's a product IBM has tried out just how comprehensive it is. Plus Maxam II by Amec, an assembler and monitor for Amstrad CPM Plus.



Amstrad DMP4000

Tony Rendle tests Amstrad's latest printer, promoted for the PC1616 range, but compatible with any micro with a standard parallel printer output.

Programming in C

Kenn Garwood continues his series on programming in C, taking you further into programming techniques.

Z88 DELAYS CONTINUE

Sir Clive Sinclair's Z88 portable machine is suffering further delays and first orders are not now expected to be delivered until mid-May. However, Sir Clive is already talking to retailers about the possibility of stocking the Z88 in the summer.

He puts the delays down to reorganising the software suites together as a whole. "It's still not complete - we've got the circuits, now they need to be merged into one."

Sir Clive would not reveal how many orders had been placed

for the Z88 so far, but he did add that he was setting up a second production line for the machine, in addition to Thom Datatronics.

"The deal hasn't been signed yet, so I can't name names at the moment, but the second line will be Ferris," he said.

The Z88 - still not delivered

Locoscript II
now due in
mid-May

THE "instant" release from Locomotive Software of Locoscript II, the long-awaited upgrade to the word processing software bundled with the Amstrad PCW machines (see Popular Computing Weekly, April 17), is now scheduled for mid-May, with the first copies going out around May 12.

According to Locomotive, all those who have already ordered the program will have been informed by letter of the precise despatch date, and it was emphasised that no shipments would be cashed until that time.

Mastertronic drops
Melbourne's
Gadget

FOLLOWING the news, last week, of the majority of the Melbourne House staff to the Mastertronic Paul St office, came an announcement concerning the fate of the Melbourne House game, Inspector Gadget and the Circus of Fear. Inspector Gadget, which had reached an advanced stage of production, with review copies already sent out to the press, has been withdrawn.

According to Mastertronic's Frank Hoffman, the reason's behind the decision were simple.

"It wasn't as good as the average Mastertronic game - so we couldn't justify asking full price for it," he stated.

Programmed by Australian software house, Beam Software - author of much of the Melbourne House output - Gadget was an arcade game based on a French Clouzeau-like cartoon

character, and according to Hoffman, Beam has "accepted the decision as fate."

The software industry has not seen the last of Gadget, however, as the licence has been maintained and another game based on the character will be written by Beam, with release around the time of the PCW Show.

Hoffman continued, "We're committed to producing super software from Melbourne House," adding somewhat bluntly, "it would have to be super to be as good as Mastertronic."

● The last two arcade machines from Arcadia, the new Mastertronic financed coin-op designers, have almost been completed - including a product under the name of Prokof. See next week's Hoffman for details.

RPGs in new
TV series

ANGEL TV is to transmit a scheduled series on role playing games in September. The series will take the form of an actual game, Knight Move, being played on air.

Although it will be screened during the late afternoon, Anglia tapes it will reach a number of adult viewers.

Computer game rights to Knight Move are expected to be announced within the next week or so.

Electronic Arts
gets Batteries

ELECTRONIC Arts has acquired Batteries Inc., the Canadian software house best known for its Spectrum word processing package.

The deal should make Batteries products more readily available in this country - Electronic Arts recently set up its own office in the UK (see Popular Computing Weekly, March 27).

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RANARAMA BY STEVE TURNER

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CRIME AGAINST COMPUTERS

Computer crime is not an area that most people take seriously. But quite a lot of damage can be done by computer criminals, and, as John Brissenden reports, the trend is growing.

They call it "white-collar crime." A lot of people don't take it seriously until it happens to them. But the problem is growing all the time.

It used to be a blanket term for company fraud, but it's now used closely linked with computer crime - fraud, theft, arson, sabotage, forgery or other misuse with, or at, computer systems.

The effects of computers are growing in all directions. There are more systems in use. Computers are handling more information. They are becoming more powerful and complicated. And more people are using computer systems.

So a major part of all these factors is the growth of computer-related crime.

The area where most computer systems are used is within companies' business systems. So it is here that most computer crimes are committed. (Some are plain fraud, committed for financial reward.)

But others are more concerned with the computer system itself, and causing damage to it. This could be sabotage or malicious damage by someone outside the company, or by an insider. This could take the form of physical attack, eg. arson, or more often gaining access to restricted information, or even tampering with programs so as to cause vast and untraceable internal damage to the system - locking, a data purge area or software theft, or piracy.

Computer-related crimes are hard to define, hard to quantify, and even harder to spot. Why?

Detective Inspector John Austen is in charge of the computer crime unit of Scotland Yard. His team is part of the company fraud department of the fraud squad, and it's their job to deal with a whole range of computer-related offences.

It's the kind of crime that has a high public profile. It makes good news copy, and it's good box-office news as well - the young schoolkid who gets caught fiddling millions of dollars out of a company, or the teenager who accidentally starts World War II on his main.

But although the reality is sometimes really that spectacular, most of the time it may be insurance, or even unknown.

"It could be the case whereby a fraud has been committed, sometimes for large amounts of money, and it just so happens that a computer system is the vehicle that

just processes through the information," says Austen.

"We've had several instances where somebody's stealing money from a bank

"It's the kind of crime that has a high public profile. It makes good news copy, and it's good box-office news as well."



Detective Inspector John Austen in charge of computer crime, Scotland Yard.

government authority and they're in a department of the authority that deals with salaries and wages, and they just write out the form, Spouses form, spouse account, spouse personnel, and they'll just feed it in. Now it's open to interpretation as to whether that is a computer crime or not."

Another problem is that if a company believes that an employee has been carrying out a fraud or other crime through the computer system, they are often reluctant to report the fact to anyone, including the police.

Some industry watchdog bodies, such as the Federation Against Software Theft, have put out estimates. FASST estimates that software theft or piracy alone is costing the industry £150 million a year. But Austen agrees that certain factors make it virtually impossible to gauge the size of the problem.

"How long is a piece of string? I think it's far to say that there is a certain reluctance to report crime that's computer-related, more than say a person being mugged in the street or having their home broken into, because there are different considerations from the point of the victim ... a certain amount of guiltiness or embarrassment, which can reflect itself back on the victim, whether it be a company or a person.

"So I think that that's a far estimation of perhaps why there is some reluctance. Although it's no good asking for hard evidence of it.

"One thing that I try to warn people about a little - I think that there are people who work in computing who are addicted to it, in the sense of this just won't leave the damn thing alone.

"They'll play chess in their lunchtime, they'll go home, they sit and play Space Invaders all evening. There is a danger that people like that, because they fit a casting of borders.

"This is the dilemma - if you want the brightest of bright young whizzkids, be more than likely will be hooked upon his subject. But there are dangers in people who get hooked upon computing."

Do they consider the possibility of being detected?

"I don't think they do. If there is one thing that's rather ironic about people who commit computer crime, it's that they tend

Continued on page 14 ▶

SPECIAL FEATURE

4 continued from page 12

"The area where most computer systems are used is within companies' business systems, so it is here that most computer crimes are committed."

to be first offenders. But that does tend to be rather unique with this sort of crime."

So how can the police attempt to combat computer crimes? Do the police Crime Prevention Departments have a role?

"They have given advice to companies, but the sort of crime prevention area that they cover is slightly different to ours. Whereas they advise on the physical side of securing policies, windows, etc, we tend to look and talk more about the logical and procedural side.

"It's talking about access levels, password controls, data processing procedures, encryption, what encryption to use if it's necessary, supervision of personnel.

"And I believe in say 'and don't'. What I mean is that if I make a point, for instance about the use of passwords, we are in a position to give an example perhaps of an instance where that has led to problems.

"So it's all very well and good people talking about 'One should do this, one should do that', but if you can show people by example, through not named example obviously, of the sort of things that have occurred, it brings it home to them.

"Even if you had a large establishment where you have a computer operator who's separate from a computer programmer, in my experience you often find that the operator is looking at night school to be a programmer anyway. And the programmer is studying at night school to be a systems analyst, and the analyst is studying to be a DP manager.

"So one never takes it for granted that because somebody is a mere data entry clerk that they don't know how to load a disc into a machine, because they probably do.

"I decided four years ago, that if we were going to provide the public with a service in the police force that was going to give them specialist expertise in this field, that it would be necessary to put ourselves on something of a public platform, by going out and talking to people in the industry.

"We needed to make them aware of what we saw as the dangers and risks, the sort of things to look for, to make them aware of the losses that can be sustained from determined attacks on a computer system, and at the same time, to let them know that we are here not only to investigate crime, which is our primary role, but also to offer advice.

"And judging by my postbag and the telephone calls that we get, the latter has overtaken the former."

The area of computer crime that has had most coverage recently is hacking. The unrestricted access to data. Austin sees this as an example of how the unit secures convictions in this very difficult area. But is hacking as much of a danger as some people believe?

"I think that it's probably more hype. The hype that's generated tends to encourage people to try and do things that they can't do.

"Your normal teenager who's got a BBC micro and plays games on it, as quite a few of our youngsters do, gets bored with that and then they buy a reader and suddenly they're interested in public exchange networks, and probably think they have more capability than they do.

"I mean there's a lot of hype been generated about so-called remote systems like banking systems.

"Now whatever technology is produced and whatever enhancement one can put by a micro it is not possible with your BBC to start hacking into Baggot Bank - you can't do it.

"The Forgery and Counterfeiting Act of 1980 caters for the making of false instruments, with the intention of deceit, whether it be manual or electronic. And that's the Act upon which we prosecute hackers.

"Now what I mean by that is let's say you and I work for the same company. You have got access to our coded payroll. I haven't got access to the payroll, but I know what our payroll number is. Or I do a combination of things to try and get your

password.

"Immediately I attempt to do that I cannot log on to the database.

"Now this is particularly pertinent today to those ATM machines, those cash dispensers. A lot of people also under a misapprehension here. If I find a card in the street, if I don't know what the number is, there's no way that I'm going to find out what the number is. But let's just say I'm tempted to stick that card into a machine and as I don't know, I'll tap in one, two, three, four.

"What people may not realise is, that by doing that, putting in one, two, three, four, they are attempting to forge an instrument."

Finally, how does Austin think that police, including the police, can are themselves against fraud or damage through their computer products or systems?

"It is knowing what to look for, there is a certain amount of knowledge obviously that has to be gained on part of the investigator to know what one is going to go for.

"I envisaged a course at the National Police College specifically to train officers from other forces. The purpose of that is so that each police force in this country will have at least one officer who is computer literate.

"All we're doing is taking experienced detectives and we're topping them up with some computer knowledge sufficient, we hopes, to be able to deal with the evidential requirements of computer-related crime.

"Bearing in mind that some people spend their whole life in the industry and still don't know it all, there's no such thing as a computer wizard and, they do realise."



Austin: "We are here not only to investigate crime, but also to offer advice."

Let your PCW do the talking

Lacking an RS232 interface, the PCW hardly seems an ideal micro for communications. Peter Worlock tries out Miracle Technology's WS4000 modem, which could change all that

Computer communications has something of a suspect reputation among computer users.

Enthusiasts take it as the best thing since the computer itself. The majority of users take it as it is: something potentially great - with a heavy emphasis on "potentially".

But it's easy to overlook how far things have come in a few years. It isn't so long since communications meant manually operated modems, all operating at 300 baud, and the only thing to connect to was an enthusiastic but somewhat bulletin board.

Now there are hundreds of bulletin boards, all of them enthusiastic but the majority of them tightly professional.

There is also a host of commercial services from the ubiquitous Prestel to electronic mail facilities.

And, not least, there has been constant development of the modems themselves. Today, the auto-dial, auto-answer, multi-rate, "intelligent" modem is commonplace.

But some computers remain better suited to communications than others, and if you had to pick one that looked like a loser in the communications stakes, you'd probably lag the Amstrad PCW.

For one thing it lacks an RS232 interface - the primary requirement of would-be communicators. And the lack of colour and separate graphics put it behind the field for services like Prestel.

Non-PCW owners have been given a boost by Miracle Technology. The Ipswich-based modem maker has released a special version of its award-winning WS4000 intelligent modem.

When coupled with a good software package like Sagesoft's ChatChat (see page 4), the WS4000 allows PCW communications to hold their heads high.

Features

Instead of the normal RS232 cable, this version of the modem has a ribbon cable terminating in an eight-pin connector that plugs directly into the PCW's expansion bus.

This means that fitting the modem to the micro is simple, and eliminates the need to buy an extra interface.

Miracle Technology has established a reputation for quality in the modem market, and this version of the WS4000 will do it no harm.

The modem is housed in a rather startling shade of red, but is well-built with solid connectors to the serial, phone and power cables. All cables go into, and emerge from, the rear of the unit which also features a reset switch.

The modem's mouth is a size and shape to comfortably accommodate a telephone on top, but the ribbon cable is of precisely the right length to give you only one possible position - immediately next to the right side of the monitor.

Since this is where 99 per cent of PCW owners will have their printers, some re-arranging of the desk will be necessary.

Pressing the reset switch, and turning the power on and off at the mains is as much as you can do from the outside. Everything else is controlled through software. For this reason, you'll need a decent software package to get your money's worth from the hardware.

Along the front of the modem is a row of status lights. These indicate power on, high speed mode, on line, terminal ready, request to send, clear to send, carrier detect, send data, receive data, and auto-answer mode.

PRETEL	Terminal	W-W:32
MICRONET DEMO	SE8051a	0p
ADVENTURE		
<p>Play LIVE adventure games on Micronet. No more boring trolls and bits and your head is protected the same way every time you blunder into the cave! Most characters are REAL PEOPLE pitting their wits against yours!</p> <p>There's even an area with hints on how to do the infuriating bits in adventure games you've already bought.</p>		
<p>1 SHADES (live) 2 STARNET (strategy)</p> <p>3 ADVENTURE AREA</p>		
<p>2 Hints 2 Hints to learn 2 RECEPTION 2 CLERS & HORRORS</p>		
<p>1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.</p>		

"Miracle Technology has established a reputation for quality in the modem market, and this version of the WS4000 will do it no harm!"

These lights may be off, blinking or steady on, depending on the modem's activities. Once you become familiar with them you can determine at a glance the status of the modem, and whether it is functioning as expected.

You can watch them pulsing and the number being dialed, and you'll also see



Micra Technology's W64000 modem

the resulting tone - ringing engaged or unavailable - taking over dialling is complete.

The modem itself is fully programmable - either through your own programs or through suitable software. For example, you can set the time the modem will ring a number before it gives up, how long it will wait after answering for a carrier signal, how long after a carrier is lost before the modem hangs up (useful for overcoming temporary signal losses), whether the modem should re-try an engaged number, and so on.

The W64000 is a multi-rate modem, the model under review supports full 300 and 1200/75 protocols, and 1200/1200 half-duplex.

In auto-answer mode, you can set the number of rings required before the modem answers, and there are very powerful automatic search commands. For example, you can set the modem so that it will try and determine the speed of the incoming line, reason, search to it, and complete the

connection.

The accompanying documentation is thorough and clearly written, with a host of practical examples. In addition to the relevant user information, there's a section for potential software authors containing more detailed technical specs.

Conclusions

The W64000 was named peripheral of the year in last year's British Micro Awards, and was a deserving winner.

There are cheaper modems around, but few match the W64000 for features, and almost all of them require the purchase of an RS232C interface as well.

Amstrad PCW owners looking for a high-quality modem at a reasonable price should put it high on their list of potential buys.

Product: W64000 1200/75 modem **Price:** £185.00 **Supplier:** Micra Technology, 26 Peter's Court, Ipswich IP1 3JZ

Comms software: ChitChat

Although buying a full-featured software package is not an absolute essential for using the W64000, it is recommended.

For some users - some bulletin boards, and electronic mail facilities - the Mod200 program that comes free with your PCW system software is adequate.

However, if that is the limit of your ambition, you're probably buying too much power in the W64000.

Accessing viewdata

To access viewdata services such as Prestel, Micronet and many "amateur" bulletin boards like the amazing MicroGnome, you will need a viewdata camera program.

For the purpose of this review we borrowed a copy of Sagesoft's ChitChat Combo package, and it turned out to be an admirable partner for the modem.

The Combo version includes both viewdata and Email facilities (they are available as separate packages) and is powerful enough to take advantage of the W64000's features.

Directories

You can create your own directory of phone numbers, together with all necessary protocol details, log-ons, passwords, etc, and simply tell the software and modem to get you on-line.

You can also create executable files to control the more powerful features of the modem.

The documentation is more than adequate, especially since ChitChat is primarily controlled through the pre-programmed function keys which are permanently displayed on screen. This, coupled with on-screen help facilities, makes the manual almost redundant once you are familiar with the features.

Prestel and Micronet

The viewdata mode is a revelation. I was dubious about the prospects for the highly colourful Prestel and Micronet screens on a green-screen monitor with a customised viewdata character set. But all of the screens were perfectly legible.

All in all, the software performed flawlessly. The combination of ChitChat and the W64000 make for a perfect camera system for all applications.

Program: ChitChat Combo **Price:** £130.00 **Supplier:** Sagesoft, 96/1 House, Regent Centre, Gosforth, Newcastle Upon Tyne NE3 3DB.

PRESTEL	Viewdata	MICRO200																						
MICROCHAT DEMO 8858321a 0p																								
AMSTRAD MICROBASE																								
Information about every Amstrad machine at your fingertips - an electronic magazine in your home. News, hardware and software reviews, hints and advice: updated DAILY! FREE telesoftware, available 24 hours a day.																								
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Precision sets new records with Superbase Personal

Precision Software, best known for its Commodore 64 word processing and database programs, has turned its attention to the 16-bit machines with Superbase Personal. Christina Erskine finds it combines power with ease of use

Precision Software is probably best known for its Superbase and Superwriter database and word processing packages for the Commodore 64. Therefore it would be a logical assumption to see Superbase Personal for the Atari ST as simply a conversion of the C64 product. Logical, but according to Precision's managing director, John Travers, completely incorrect.

Travers — and he should know, his brother Simon wrote both programs — says that Superbase Personal has been written

entirely from scratch. The name Superbase being duplicated only to give the product a familiar identity with potential buyers.

Superbase Personal runs under Gem (a Gem-based version is also available for PC compatibles) and uses all the familiar drop down menus, etc, running in medium and high resolution modes only.

Getting going with Superbase is rather deceptive; it's wretchedly simple, and believes the program's power. You might expect a menu-driven database to be complicated by sub-menus, sub-sub-menus, and so Cancel option just where you wanted it, but all Superbase's capabilities are accessed by the six menus at the top, where you would find the Gem Desktop options, and a string of easily understood icons at

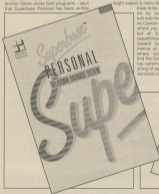
the bottom.

For instance, once loaded, Superbase gives you the choice of Desk, Project, Record, Process, Set and System menus.

Desk simply gives you the copyright message. Project is the menu you will need straightaway; its options deal with opening, creating, editing, etc, your files and indexes. On start up, many menu options are unavailable; these are shown in faded rather than black type.

The Record menu contains options for attaching your individual database records, or adding to them. Process deals mainly with importing files from other programs and generating labels. Set enables you to alter the way in which your database is laid out. System gives you printer options, a directory list, etc.

In addition to this, you get the remarkably easy-to-grasp menu at the foot of the



screen for flipping through, viewing and creating your records. The menu compass can't beasing more than a passing resemblance to the controls on a tape recorder.

Thus > shows the next record in the file, < the one immediately previous, >> is a 'fast forward' - display all following files, << a 'rewind' - display all previous. There are also 'pause' and 'stop' buttons.

The 'F' icon allows you to search for a particular file by typing one value from the field in the record you need, and the program will bring the required record up on screen. However, the key symbol for manipulating your databases is contained in the square sign.

This is the 'filter' option, which enables you to view, use or print out your data according to a set of parameters which you determine. You select which of your fields you want to manipulate and then how you wish them manipulated. The symbols, as shown in the screen picture, are mainly self-explanatory: the same as, greater than, greater than or equal to, lesser than, lesser than or equal to.

'LPC' applies to text strings, '<' to

numbers. You set the parameters themselves by typing in the information in the Value box: for example, 'Lastname LIKE "[A-D]"' gives you all surnames on the telephone with A, B, C or D.

Creating files and records templates is also made easy. The number of fields is limitless, with the restriction of 255 characters per field, though surely, for most people, numerical data can be entered in a number of ways according to how you wish it presented on-screen, similarly with dates.

One of Superbase's most attractive features is its ability to port-over files from other products. For text, these must be Ascii format. More exciting, however, is Superbase's ability to incorporate pictures from graphics programs - so long as they run under Gem.

The most obvious uses for this are plans, charts, or pictorial representations of statistics which you may want to incorporate as standard letters.

Conclusions

While I have talked about ease of use, it is

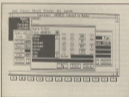
worth noting that the Superbase manual (which is clear and thorough, with plenty of tutorial sections) does not attempt to explain databases: it assumes you know the terminology and how databases work.

This article by no means exhausts the program's options and capabilities, but attempts to give an overview of how it works and salient features.

I found it versatile and comprehensive, and incredibly easy to get into. Obviously, this is due in part to Gem and the simplicity of mouse control, but all credit to Precision for not complicating the matter.

If you feel you could do with a database program for your Amiga, PC or compatible (with Gem) or Atari ST, Superbase Personal is worth close investigation.

Program: Superbase Personal, Miras
Atari ST, Commodore Amiga, IBM PC, compatible with Gem operating system, up to the Amstrad PC1512 Price: PC's and ST £89.95, Amiga £149.95 **Supplier:** Precision Software, 8 Park Terrace, Worobster Park, Surrey KT14 3JZ.



Screens from Superbase Personal. Above: note the 'tape recorder' style bottom menu for viewing your records. Right: the filter screen enables you to sort records according to a large number of criteria.

Filter Filter ADDRESS

Title	[Y]	[=]	[<]	[AND]	[+]
Forename	[C]	[>]	[OR]	[-]	
Lastname	[L]	[=]	[NOT]	[#]	
Street	[C]	[>]	[LIKE]	[/]	
City	[L]	[>]	[LIKE]	[/]	
Code	[L]	[>]	[LIKE]	[/]	
Country	[L]	[>]	[LIKE]	[/]	

OR "USA" OR Country LIKE "WEST GERMANY"

[OK] [Clear] [Cancel]

Guide to databases

A database is basically a computerised filing cabinet, used for storing records in databases of any power whatsoever, the information can be indexed or sorted according to the various headings you've used within each record. You could, for instance, list all your friends living abroad, all customers still owing money after a year, etc.

Many databases have an integrated 'mail merge' or label printer within the package. You can then print address labels of all, or some, people on your database according to the order you have made.

File Collection of records running under the database program.

Records Similar to each file or sheet is a filing cabinet.

Fields This is the name given to the headings within each record. For example, in a simple address book, database, your fields might comprise 'last name', 'last name', 'address' (subdivided into, city, street, town, district, country and pin-code), 'telephone number', etc.

Relational database A database which allows you to sort your records according to multiple factors. For example, print out all records showing people whose surnames begin with F, living in Yorkshire, have 2-4 children, plan to take a holiday in Spain within twelve months, and also own a dog.

Having the ability to print out all records with people whose surnames begin with F is not enough to qualify as relational. Superbase is a good example of relational database.

Integrated database A database program which can use and incorporate information from other programs - usually the database will be part of a suite of programs in one package - and whose files can be incorporated in the other programs in the suite.

Mail merge Printing standard letters, labels or forms where only the name and address, for example, need be changed from sheet to sheet. You specify whose name is to go in the 'gaps' and each letter, addressed to each individual, is printed out.



with Ken Garrock

The Sord connection

At Dealer, of Willesden, London NW11, writes:

Q I've just bought a Sord-colour monitor (second hand) which I'd like to use instead of a TV, with my Spectrum and QL.

I have now discovered that there is a different plug on the back of the monitor to my composite video phone (Open disc) plug on the Spectrum and certainly the QL. I realize that the Open output is monochrome and have made the well known 'zap from the radiator' modification as well. This appears as a phone socket at the side of the Spectrum.

As I get the monitor cheap, I was too thrilled to check it out. I'm not sure what type of signal the monitor expects.

I enclose a diagram of the plug which appears at the back of the monitor. The model number of the monitor is GMP-142.

I hope that you can help me with this problem by supplying a pin for pin diagram or something that I can make into a converter lead if that is what is needed. I'd really like to find some way of making both computers work with this monitor, but any help on either would be appreciated.

I might be able to afford the Adapt RGB Spectrum interface if necessary - will you comment on this, or suggest some other alternative?

A I don't know what the connections are for the monitor. However, there is a way of finding out by educated guesses. If the monitor is RGB, then there will be Red, Green, Blue, Sync and Ground connections. If it is composite video, there is just composite input and ground. If any of course. Have both since there are enough connections available.

The way to find out is to take the composite output from the Spectrum, and split it into its two component wires, video and ground. If you connect the ground to the casing of the socket, with any luck, this will be ground. Next poke the video output from the Spectrum into each of the holes in turn.

If you get a red, green, or blue screen on the monitor, then you have found the R, G, or B inputs respectively. If you get a picture, then you will have a composite input. Once you have this, poke the ground wire (split) into each of the other holes to find the ground input. The picture should stabilize when you get the correct combination.

By the looks of the socket, it is more likely to be RGB than composite so, having found the R, G, and B inputs, you need to find sync. This can be done by connecting the QL's RGB lines to the appropriate holes, and then going around with the sync line to get a stable picture. If it is RGB only then the Adapt interface will be needed to get the Spectrum to work.

Make sure that any test connections you make are very brief, the voltages used are small and it is unlikely any damage can result if you are careful.

If all else fails, someone will, hopefully, write in and tell me what the connections really are so that I can print them.



Sord colour monitor GMP-142 socket

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem **Post It** to Ken Garrock and every week he will Post back as many answers as he can. The address is Post & Pique, PCB, 10-13 Little Newport Street, London WC2E 8PP.

Baffled by the BBC bytes

Don Harvey of Chippenham, in Wilt, writes:

Q I have a Master 128 with one 3 1/2 inch disc drive, a KX1000 printer and a VGA. In the March 27 issue of Popular, you published three programs for the BBC. I have just entered the sideways print utility. Having just spent the last hour double, triple, and quadruple checking my typing, could you please clarify a couple of points of interest to me:

1) Why does the program stop at line 80 with 'Byte at line 80'?

2) On re-entering the line at 80 with LDA =>BCP (not SCDF), it then prints a solid line down the left hand side of the screen and stops.

I'm baffled.

One other point which you might be able to help me with is this: if I deliberately omit the semi colon in line 158 between the zero and the ? so that the line reads '64000-64001:0&A', the program stops with no error code, merely the message 'at line 160'. Why the machine prints at line 160 with no error code is a new mystery to me. I find that the Master does this reasonably regularly and wondered if you could offer an explanation.

THE BBC BPL, resp. out JMP #FF0

Line 80 reads LDA #102A, SCDF's 'yd' which will only give you the byte given if you put a # before the SCDF's. This is because it is impossible to put a value larger than 255 (FF) in the accumulator (A).

The program works by using the LAME command to store the string you want to print at the location pointed to by '10200+X'. So, using indirect addressing (LDAA@PLV) each character in the string can be read.

The definition for each character is then obtained with the OSWORD (#FFFF) to concatenated stored at SCDF onwards. The character number for this call is placed at SCDF, i.e. at the start of the definition buffer.

The next section of code turns each character on its side by shifting each bit of a row into a column at the definition of character number 255. Character 255 is then printed followed by a space and a left to position for the next one.

The use of character 255 is why you got a line down the side of the screen (Line 255 is a solid block). As it stood, the program was not converting the definition property. The LAME command uses the vector 6200, 6201 to point to the service code, normally bad command.

Your second point, concerning the 'at line' with no error code seems to be due to the program being at fault.

Usually, the no error code situation only arises up when using machine code routines from within programs.

If the machine code does something unexpected, the Basic interpreter generally hasn't got a clue as to what has caused the error and so, cannot assign an error message to the fault.

For example, if you run the sideways program so that it sets up the LAME command and the 64000-64001 (set an RTI command in), and then GOTO 100, you'll find the no error situation occurs since the machine code is doing something rather unexpected.

Incidentally, if I try taking the color out of line 160 then it I get it is a syntax error at 160. This could point to a difference between the 128 and the color BBC B.

C. why it's so good

Last week, Kern Garooh began his series of articles on programming in C. This week, putting C to work and playing games.

The easiest way to learn and understand a language is to use it, and see it in action. C programs are very structured, that's to say that they are always built up in a set framework. Probably the simplest program is:

```
main()
{
    printf("hello, world\n");
}
```

All this does is print out the message in quotes with the printf function. Note that commands are always in lower case and the first line is main(). All programs have to have main() if they are to compile and run correctly. The function can theoretically be anywhere in the program but it usually placed at the start.

The next line contains a { open curly bracket. This is used to denote the start of a section or block of instructions, in this case the start of the program. The printf function on the next line is used to output characters to the screen starting from the next cursor position, subsequent printf's simply follow on the same line.

To get the program to move the cursor around the screen, formatting characters need to be used. These are indicated in the quotes and take the form %n or %f (usually, from back or clear screen). %i is used to get a single back slash since \ by itself is a null or no character.

The end of the program is denoted by the close curly bracket } which is also used to end a section of code. The following example shows how a program can be split to make it easier to understand with a function being defined separately from the main program itself.

```
main()
{
    int i;
    i=123;

    printf("let square what? %d\n", i);

    sqn(i);
}

sqn(n)
{
    Here the function sqn is defined separately
```

from the main program and used in the printf statement. The numbers to be printed are inserted where the %ds appear in the

quotes. This gives a real way of displaying numbers and if you insert %f instead of %d, the number is printed in hexadecimal. %c is used for characters.

The program also shows how variables are set up and used in C. i is defined to be an integer (a number from -32767 to +32768) and from here on in the main program is always an integer. All of the usual functions, ++, --, etc. are available for use, bearing in mind that they will be non-decimal when using integer variables. For decimal numbers, the float defines a used.

Other simple data types are 'char' for single characters, 'short', 'long' and 'double'. The last three depend very much on the compiler, or some they are not

```
/* Program that prints the squares of numbers
 * up to n. This is a good example of how main()
 * is used.
 */
#include <stdio.h>
int main()
{
    printf("let square what? %d\n", 123);
    sqn(123);
}

sqn(n)
{
    int i;
    for(i=1; i<=n; i++)
        printf("%d squared is %d\n", i, i*i);
}

/* This is a good example of how main()
 * is used.
 */
#include <stdio.h>
int main()
{
    printf("let square what? %d\n", 123);
    sqn(123);
}
```

implemented, others handle them in different ways and sizes.

The function sqn is defined after the main program and has the argument n which takes on the value passed to it, ie, sqn(123) makes n=123 within the function. The main thing to note about n is that it is defined only within the sqn function, ie, it is local to the function. The return command tells the computer that the value n is to be passed back to the calling program and placed in a variable. Here it is simply printed.

So far, the demonstration programs have been fairly straightforward and have performed one thing only. The sqn program can be easily modified to do something a little more complex like print out the squares of a series of numbers. Simply alter the line i=123 to for(i=1; i<=10; i++)

This forms a 'for' loop for the following statement, in this case the following line. If more than one line needs to be repeated, this encloses the set in {} to make them form a block. The for has three parameters following it. The first defines the start value of the counter, eg, i starts with the value 1. The next contains the inverse of the end condition, ie, keep looping until this is false.

The last part sets up the increment to be used at the end of each loop. This could be for(i=1; i<=10; i++) but the C short cut for this is for(i=1; i<=10; ++i) could be used.

There is no semicolon at the end of the for command since it starts a structure. All statements and in semicolons to make sure the compiler knows where one ends and the next one begins.

An alternative way of looping would be to use while. To make the program use this requires the following changes take out the for and printf lines and insert the following in their place:

```
while(i<=10)
{
    printf("%d squared is %d\n", i, i*i);
}

i++;
```

In this situation, i must be set up before the loop begins and must be incremented within the body of the loop itself. Since there are two lines within the loop, they need to be made into a block starting with { and ending with }. The while command continues looping only if the argument (i<=10) is true and, in this case, exits when i is equal to 11.

The other main command, and perhaps vital, structuring command is if. In C, this takes the following form:

```
if (expression)
do this if expression is true
else
do this otherwise, though this is optional
```

The simple game program (see box) shows all of the above commands and ideas, plus a few others, in use. Notice how the AND, OR, NOT, and equals differ from other languages. Logical AND is &&, bitwise AND is &, logical OR is || and the ! before = is not equal. For equals, == is used for equality, != is in a test, == tests for equality, != as it usually the case. The program will run in any C, just type it in and follow your normal compile commands.

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POPULAR Computing WEEKLY

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THE SINCLAIR QL

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Exclusive review of Digital Precision's IBM-type keyboard

Never forget, wise computer owners say, that the QL, for all its facts, was the first affordable 68000-based micro. Apart from the Amiga, it is still the only 68000-based micro offering true multi-tasking, the Atari ST doesn't.

Support for the QL, then, is still strong, from users and a small number of third party software and hardware manufacturers.

In this supplement we're looking at Digital Precision's replacement keyboard - IBM quality for your QL. We also have an exclusive preview of the desktop publishing software package, which remains power with ease of use.

CAD software from Silicon micro, and Element's advanced mouse systems, among many others, go to prove that the QL is far from obsolete. ◀



NEWS

WIFEY

Housewife is a housekeeping program from DWF Software. A real housekeeping program. Nothing to do with computing utilities. With QL Housewife, you can make up a personalised shopping list based on your usual shopping habits, and score a choice of three recipe programs, for starters, main courses and desserts. You can name any number of guests from 1 to 20, and you will be given the recipe of your choice with the correct quantity of ingredients, all quantities in metric and imperial, cooking temperatures and an option to print out.

Obviously a menu driven program Housewife costs \$1.99.

DWF Software, 11 Pinedale Close, Bromley, Kent BR2 8NL. Tel (0159) 661591. ◀

REVIVED

PDFE Software of Birmingham is still adding programs to its list, and now has over 25.

Recent additions include *Luxuria*, a disc economy program which operates on all or any lost files (and not only, as the title might perhaps expect, on Fortis, LSI, and an invoice generator for £30.

Cash Tracker, a debugged, extended and speeded up version of the original *Quest Cash Tracker*, is now available to new users at £50 as well as an update to registered users at £20.

Name And Address is now available on disc as well as microcassette, in standard Archive or ArchiveM versions. The price?

Features of this popular program is a "secure" procedure allowing data to be backed up easily before the changes are finally saved.



PDFE, 49 Frederick Street, Birmingham B4 3NB. Tel 021 230 3942. ◀

TURBO

Alberte Consultants has produced a program which re-configures Quill to speed up the cursor, which, along with other small changes, effectively speeds up the whole program and - no small matter to anyone writing more than the old letter - increases work throughput.

QL TurboQuill costs \$15 and can be ordered from Alberte Consultants, 35 Holy

Grove, Farnham, Hants, who can also provide more information about the program. If ordering, please quote the version of your Quill so that a matching TurboQuill version can be provided. CONVI... But does not work with TurboQuill, as all the default parameters of Quill have to be set up before the turbo program is applied - but the increase in speed is well worth this minor inconvenience. ◀

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Crusades VIII	5.00	5.00
Crusades IX	5.00	5.00
Crusades X	5.00	5.00
Crusades XI	5.00	5.00
Crusades XII	5.00	5.00
Crusades XIII	5.00	5.00
Crusades XIV	5.00	5.00
Crusades XV	5.00	5.00
Crusades XVI	5.00	5.00
Crusades XVII	5.00	5.00
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GROWTH INDUSTRY

Superplant would like another unlikely comic character, but it is, in fact, a company which writes software on plants. Tony Hald, a professional gardener for twenty years, found that his customers asked him such complex questions about plants and gardening that he began to feel that he needed a computer to answer them all. He was then inspired to write a series of data banks, based on the 32Change Archive data base package, which would give advice on the choice and care of plant groups.

The five databases so far cover wild flowers for the garden, fruit trees and bushes, house and office plants, trees, shrubs and climbers, and flowering about garden plants. Inside information about habitats, plant characteristics, soil types and plant needs. Mr. Hald, who has a keen interest in conservation, has included notes about plants which are attractive to wildlife, and trees and hedging shrubs useful for planning environmental improvements.

The databases can be bought as a complete package for £29.95, any one of the programs with the basic gardening module for £11.95, and as additional packages for those who already have the basic gardening module for £8.95 each. The programs are available on microdrives as a choice of 3 1/2 or 5 1/4 in discs.

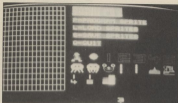
Superplant software, Langcliffe Nurseries, Langcliffe, Tregaron, Dyfed, Wales SA725 6QF. Tel. 097 423 223 (Open 10am to 5pm). ◀

LUCKY BAG

Pyramide Software is starting to release a library of cartridges featuring all kinds of useful programs, programming tips, mini utilities, routines and games sent in by professional and amateur QL users, particularly in SuperBasic. Called Bag of Tricks, the first two volumes contain respectively a character set, PEEKS and POKEs, a screen compressor, a Basic version of Pacman and various utilities (volume one) and a set of routines for tracing files, drives in use and free memory space, some games, some Graphic Toolkit out-calls, and more utilities (volume two).

Information about Bag of Tricks, and about submissions for future volumes, from:

Mac Promotions Ltd., 28 Manserley Grove, London SE8 7PX. Tel. 01 461 2764. ◀



Super Toolkit

SMILES

Smiling Software is still offering reduced prices on a range of software, including Sound Experimentator at £5, Free Toolkit at £5, Game Toolkit at £5, the Complete Toolkit (the two Toolkits mentioned plus Character Toolkit) for £10, and the machine code "subroutines" arcade game Blots for £3.

Smiling Software, 19 Fir Road, Harple, Stockport SK6 7QX. ◀



Sound Experimentator

CHAR-ED

Char-ed, by Colin Gyle of Vite Sofas, is a font editor program designed as a utility to work with Toolkit II. The Toolkit ROM allows SuperBasic users to select character sets other than those default in the QL, as well as altering the pixel block size of characters. Char-ed, in addition to Toolkit's own facilities, supplies extra pre-defined character sets, the creation and editing of new fonts, printer dumps and use of new creations in SuperBasic programs.

The program is designed to be easy to use, with a system of menus and prompts

such that the user can learn to manipulate it quickly without continually turning to the manual sheets, which can then be clipped away in the QL. Users Manual for reference on the predefined character sets when needed. Re-defining characters and overcoming the limitations of the QL's character set is covered in detail.

Case Electronics is also offering the Toolkit II of EPROM, and Liberator's Software's QLiberator Basic compiler together for £74. Case Electronics, 880 St. Albans Road, Garston, Warrford, Essex W12 8SL. Tel. (0823) 672182. ◀



◀ Char-ed - font editor program designed as a utility to work with Toolkit II

PUBLISH OR BE DAMNED

AN EXCLUSIVE REVIEW OF DP'S DESKTOP PUBLISHER BY HELEN ARMSTRONG, AND RON MASSEY ON HALLMARK'S Q-WRITER FONT-CREATING PACKAGE

Put simply, the purpose of a desktop publisher is to provide text and illustrations, arrange them to make a presentable page, and allow that page to be printed. It must, at the very least, be a step up from a typed page with a photocopied doodle. I would say that the minimum step up implies graphic capture, justified and unjustified column layouts, and a choice of headline characters in adjustable sizes. After all, you can do a helluva lot with a good typewriter, a photocopier and some Letraset.

Desktop Publisher requires a 255 memory expansion, and incorporates twelve graphic (headline) fonts and eight QL text fonts as standard. There are 100 original graphic symbols (including a choice of trees, for arborophiles) and 100 point-break signs. What this latter means in reality is that you can use any of the graphic symbols as a point-break, as well as the standard shapes. The way is paved for an almost bottomless supply of backgrounds, borders and patterns. The decorative fonts are proportionally spaced, but all character proportions can be redefined horizontally and vertically, pixel by pixel, and descenders, ascenders lengths altered. All characters and graphic fonts can be mirrored with AND, OR, and XOR options; inverted wholly or partly; mirror-imaged, boxed, inverse boxed (wholly or partly), magnified up to 15 times in either axis (this includes the cursor path), striped or stippled, and rotated through steps of 90 degrees (sorry, no 45...).

Extra fonts

The program travels on two cartridges which may well carry a few extra fonts. Extra fonts can be imported. Desktop Publisher will load any ASCII file, plus Quill files with non-ASCII characters; in fact, say the programmers Cliff and Andrew, "almost anything which can be translated into an uncompressed mode. All fonts can be edited, or adjusted letter by letter during makeup.

Text can be justified pixel by pixel, which allows for very accurate placement of annotations on drawings. (Incidentally,

vertically, sideways or even upside down) and carefully spaced text. Text can be justified, ranged left or right, or centered, made bold, italicized to the left or the right or inverted. There are four different styles of underlining, including double and single, vertical and horizontal ruled lines and boxes, columns to any width, variable-line feeds on screen, and windows generated out, copy and paste over both pages. Not only does the page scroll, but the contents of any window scroll as well. The program is completely compatible with Quill, and performs the full range of editing functions on Quill texts. DP's preferred method of generating outside text and graphics, of course, are their own programs **The Editor** and **Eye Q**, which I'll be having a brief look at. Text can be generated inside the program, and in the smallest text size and maximum line feeds (without actually overlapping) each page can handle up to 385 characters. A full page of work stores in about 36K, or one microsecond.

As well as generating patterns and line graphics, Desktop Publisher includes clip art for pasting, and can import graphics from various sources including Easel and (if you have one) via a digitizer, all fully editable.

There are four different styles of screen cursor (partly for accurate editing, partly for fun), and a two-course vertical ruler appears on the main screen. A calibrated green grid can be called up. The working area scrolls and pans, and can be joystick-controlled.

Access to database sources is fully hierarchical, and any user who 'gets lost' or performs a wrong command inside the editing levels can get out safely and quickly via the esc key without damaging the work or causing the program to lock.

Naturally, DP's pride and joy, the **Turbo Supercode Compiler**, was used in writing the program, and Cliff said "We had to insert great long loops in places to stop the program from moving too fast for Freddy brought us the Turbo update, and we had to put even longer loops in." More important even than speed, in my mind, is



the very complete set of status reports, along with the font, graphic menus and instruction menus which are displayed to the right of the working area at all times. Although the program is fully menu-driven, nearly everything can be done with single keystroke commands instead. The cursor can be frozen, and caps lock is indicated on screen.

Desktop Publisher supports two paper formats and four different print routines, printing AI and desktop in both landscape and portrait, with vertical and oblique printing options for titles. The printer driver is an usual directed towards Epson compatibles, but is reconfigurable for most other suitable printers (ie, not daisywheel) in both serial and parallel modes, and with multiple pass printing up to five times for a cheaper finish.

The two packages which are being offered alongside Desktop Publisher, **The Editor** and **Eye Q**, have already been around for a while. DP states that Desktop does not require either of these programs to operate but, obviously, the dedicated programs have more facilities than integral custom designers.

Eye-Q by itself costs \$29.95, and is a freehand, box, rubberband style graphics generator. The basic functions are point/brush, airbrush, erase, fill, and rubber bands in circle/ellipse, line/arc or rectangle/box. Operation is by window menu and by single keystrokes - a great many functions can be performed on the graphics screen by the latter. For instance, the size of the cursor (and therefore of the point/brush) can be changed using CTRL-W, CTRL-T allows the typing of text characters onto the graphics screen in various different modes, and the program incorporates a font editor.

Screens can be saved whole or in part



Usable as either a stand-alone program or as a background job serving a text editor, the current edition of *Q Writer* is supplied with two distinctive font styles and in two configuration versions on one master microdrive cartridge.

Users of QLs without RAM expansion can configure the main program module so that only one or two selected fonts are held in memory at any one time. Fonts are loaded with the **N14...LOAD** drive...fontname;font...number command. Whenever a new font is loaded using a current font number, the previous font is cancelled.

Alternatively, users of expanded machines may opt to use the special main program module, with eight of the fonts held in, and may load up to a total of 32 fonts at any one time, each of which is identified with its own number code.

Switching between fonts is done by using appropriate codes and can include any other printer control-codes supported by the *Q Writer* system. Printer commands are initialised with *Q Writer*'s pre-translation mode by adding a line to **QUALITY** or **The Editor's** host program: **N14...USE Device** (see our page).

Changes of typeface in *SuperBASE* are made by sending **ctrl** control codes to the printer, initialised by the number two. Starting a particular typeface, such as *Q Writer's* Roman font number five would be done by inputting, in *SuperBASE*, **Openend, N14%**.

All subsequent font changes are made by prefixing the font number required with the number "2". Typically, a command from *SuperBASE* for changing from one font style to font four, a particularly good title English typeface, is made by inputting: **Print%2, char(2), char(4)**.

If used with an extension toolkit supporting EBIT, font styles and any of the printer control commands supported by *Q Writer* may be sent to the printer from *SuperBASE* by prefixing a block of text in a particular typeface with the command: **EMPUT%2, E,font no.**

Users of *The Editor* can produce an equivalent control code insertion in a block of text by inputting characters **<CTRL> <SHIFT> <C>** (producing *The Editor's* own character "2"), with an over-code (E,font no), followed by any other *Q Writer* control characters required.

Other commands supported directly

by the *Q Writer* system include codes for the printer bell (7), tabulation (8, plus two additional numbers indicating tabulation spacing), form feeds (11), select and deselect proportional printing (20 and 18, respectively).

Q Writer's definition of superproportional spacing is that, when selected, the spacing of each character is equal to the widest character in the font. Selecting another font exactly the superproportional spacing option selected by a previous font.

Of particular interest is a facility for selecting and deselecting, character space-out (13 and 18, respectively) and another facility for selecting either normal width or double width (15 and 14, respectively). The latter facility produces a typeface with increase of 25 times that of the normal width.

Q Writer's fonts may be used with any *Open* compatible printer either directly from *SuperBASE* or from within text-management programs such as *Print's* *Quali* or *Digital Precision's* *The Editor*.

The only real limitation encountered with *Q Writer* is that, if two or more jobs are running concurrently in the QL, they will remove all data from the

to the right is meant

this English example

Expanded title English, left; Roman font number five

number five set at font 14

Expanded Data Font

Expanded Data Font, with Space Out

N14 queue, sometimes producing unpredictable results.

An omission from review copy of *Q Writer* is that it did not include a font editor for users having particular font or special symbol requirements.

Although *Fullmark* has promised to provide a character editor for *Q Writer* within the next three or four weeks.

A well thought-out, easy to get on with program, my only criticism of *Q Writer* is its rather minimal documentation. Of its nature, *Q Writer* is not a difficult program to get to grips with, quite the contrary. But, as with so many programs of this type, it is easy to overlook useful applications. **◆**
 Supplies: **TE Computerware**, Stone Street, North Stanford, Ashford, Kent CT20 8DF, 0303 81 2801.

(window selected), compressed or uncompressed. Screens and fonts can be saved in basic as well as to storage media, and with any extended QL more than one Eye-Q can be run at a time.

Status information is displayed on an administrative status line at the top or bottom of the screen.

The Editor, now £28.00 (\$39.95 for the expanded QL version) is a non-Word-processor. It is a text generator which can handle any kind of text file, document, program, as well as a range of special characters for handling ASCII and control commands as if they were normal text.

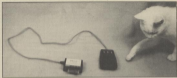
The great advantage of *The Editor*, apart from its flexibility of application, is speed. The advance set-up achieved by users waiting for certain wordprocessors (including the wanted limited PCW, much used in this office) to scroll through, delete or move blocks of text is not a problem.

The program does not impose its own format on the text, except as the user specifies, and so "control" data travels with the output, which is then clean to be handled by another formatting source, such as *Desktop Publisher*. Files can thus be generated for final embellishment elsewhere, or brought in from other WTs (*Quali* in particular) for bulk alteration and reformating.

At the moment, *Desktop Publisher* will not take photographs or make the coffee, but they're working on it. It certainly will do almost everything you mean from a DTP package, and in conjunction with *Digital Precision's* other programs forms a very impressive system. **◆**
 Price: £69.95, with Eye-Q £94.95, with Editor £184.95, with both £129.95.
 Supplies: **Digital Precision**, 222 The Avenue, London E4 9SE, 04-527 5485.

COOL LOOK AT CAD

Eisensoft's ICE has become such a standard fitting for serious QL users that not a few of us would have to think twice if the machine beamed up first thing in the morning without the desktop in the right hand corner. Icon Controlled Environment. For the information of the others, in a WEPES-type icon-driven front-end program which allows you to LOAD, FORMAT, COPY, RENAME, etc. etc. your files without having to type out "mbdL..." and the rest every time. The easy/variable press's command list. ICE is installed in a jiffy in ROM cartridge, so it boots virtually automatically, and it supports a variety of other icon software such as CheckE, which allows the way multi-



EISENSOFT'S WIMP SYSTEM AND RUBICON'S VIEWPOINT USE THE QL'S GRAPHICS IN DIVERSE WAYS. DENNIS LEEK ASSESSES THEIR STRENGTHS AND WEAKNESSES

tasking, among other things, and ICE Toolkit, which incorporates ICE features in your own programs, all at a reasonable price.

Last year Eisensoft consolidated ICE's usefulness by bringing out a mouse controlled version, along with two grades of mice. Icon-driven means are ideal for people with a steady hand and no keyboard skills. Being the opposite, I generally prefer not to use them, but since you are committed to icons or indeed anything which can't be set up by single-keystroke commands, a mouse is a godsend.

The ICE mice have the basic ICE system already installed in the interface,

an alternative to buying the mouse and fitting it to a previously owned ICE. There are two versions, the Mouse 41 around \$40 and the "Jolly ball rool" Supreme Mouse at around \$80. Both our samples worked pretty well, especially considering the adverse conditions on my working surface, which is not usually configured for mice.

Having tested the mice on ICE and CheckE, and quickly getting used to moving the cursor around via the desktop, I went on to try out Eisensoft's ANICE freeware graphics package. It was here that I had my first goosie with the handbook which, like many other user documents, is perfectly clear if you know in advance what you are supposed to be

Three dimensional computer aided design for the Sinclair QL" says the subtitle on Viewpoint's smart black and white packaging. Elsewhere in the comprehensive handbook, it reminds you that it makes sense to plot out drawings of any complexity on graph paper first. Apart from the nastiness of the final output, CAD packages are only an advantage if they are flexible enough to make real savings in time and trouble. Viewpoint's handbook takes considerable care to orientate the user so that, without contracting any false sense of security, I found that I could start screen drawing without tears.

As it was a while since I had used a CAD package, I went for the demo first. Pressing F gave me a blue wire frame cube with the x, y and z co-ordinates in yellow and red. I wasted time trying to remember what r, g and a meant, but once I dropped that and did as the instructions told me, I found that it was easy to rotate, zoom in and zoom out around the cube in larger or smaller jumps.

Using ALT with the cursor keys gives much larger increments, but with the alphanumeric keys it stops any further

progress, so that rotating can be done in large jumps, and zooming in slightly more modest steps. I silly enlarged the cube right off the screen, and then had a tedious job on my hands to bring it back again before I had realised that I could zoom it much faster by using F. All the movements can be repeated by holding the keys down. Reconstruction of a complex drawing after each movement in mode 4 graphics is by no means slow, but it becomes tiresome if you are doing a lot of manipulation, so the screen can be toggled to mode 4, where redrawing takes place very quickly.

The second demonstration is a set of spherical polar co-ordinates which can be twiddled about to get a clearer picture of what different axes and co-ordinates mean in practice.

Constructional screens can appear either in VIEWPOINT mode or in entry mode, and can be toggled (from entry mode only, although it affects other screens) between mode 4 and mode 8 graphics. Entry mode accepts the instructions which build up the figure. For simple three-dimensional shapes this is easy; the program provides a number of standard shapes: box, disc, sphere,

rectangle, line and a polygon with any number of sides between 3 and 10. There is also a mirror image command which speeds up the building of symmetrical forms, but must be treated with caution if you don't want to end up with a mirror image in the wrong plane - and although there is an immediate delete function, I haven't yet succeeded in "undoing" a mirror image.

Other commands which speed up drawing are Join, which joins two numbered co-ordinates with a straight line, and Search, which enables co-ordinates to be accurately "grabbed" and identified in the lower left hand subwindow (and also identifies the real whereabouts of the cursor, which by the very nature of the process is quite easy to lose track of).

Other commands display a set of eye axes over the drawing, or alternatively superimpose a grid on the same plane as the cursor. (T)ranslate moves the whole drawing along one of the axes, and (R)otate moves the cursor instantly back to the screen centre, which can be an essential move if another manipulation has moved the cursor suddenly off-screen. (W)rite (text) allows text to be overwritten on the drawing. The text does not become

doing. The quibble, for instance, that it isn't entirely clear WHICH of the three programs prefixed EDIT you are supposed to operate can be answered by saying that only a nobody would use the wrong file. But a user book should guide even a nobody through a loading sequence without confusion. Throughout the rest of the manual, too many steps are referred to vaguely or out of sequence.

The nice replace manual ICE's double-click/single-click operation with the centre/left hand buttons on the mouse. In ARICE, the left hand button is used only to change the ink colour during drawing.

The QL's processing power means that it can handle complex graphics quickly. The mouse enables quick and accurate (depending on how steady your hand and eye is) freewheel cursor movement. Loading ARICE puts you straight into a black screen with a tuppenny-sized white dot for a brush. This is the experimental screen for new users, where you can practice painting broad strokes while scrolling through the ink colours using the right hand mouse button, and turning the ink on and off with the left one.

However, these are the only two choices which can actually be made with the drawing screen. All other changes have to be made through the main tool menu, which entails much cursor shifting and clicking to and fro, which slows down the whole process. To take a simple example,

part of the drawing, but remains (and prints out) at the screen position where it was entered. It can be removed wholesale by CTRL W, but not edited.

Colour is deployed by the cursor, and the colour of the next piece of the drawing to be laid down can be selected at any time via function key I and a menu. There is no colour fill function, and personally I found the colours more distracting than helpful on complex drawings. They occasionally helped to establish perspective - this is a matter of personal taste.

Colours already laid down in either mode can't be deliberately changed (although switching modes automatically causes the usual changes). Indeed, once it is on the screen, nothing further back than the last command can be altered without re-starting the entire drawing. Delete removes the last operation (this is effectively limited to the standard library shapes and the join function), but CTRL D removes the lot, and the user's manual freely reminds the user to save the drawing regularly.

Solid three-dimensional figures (as opposed to wire outlines) are achieved by hidden line removal using back surface

drawing (click on a point visible, the 'BIT' function has to be reselected from the main menu for every change of ink colour).

Using the crosshair brush, the colours can be changed piece by piece. The x7 screen magnifier is helpful here, but it can be done on the full screen if you have patience and good eyesight.

As well as plain ink (the usual eight colours in mode I and four in mode II) two colour effects, airbrush and stipple/stripes can be obtained from the menu. Airbrush simply gives a random stipple in the track of the brush, with a choice of five stipple densities. The INK menu (which does give you visual indication of which ink colour you are changing to - you just have to go through two menus to find it) allows a choice of plain, or any two colours mixed in regular stipple or non-plain hairs, plus their inverses.

Following the last operation is done via the Undo menu, a window which appears on the drawing screen when the main menu is selected by pushing the middle button on the mouse. REDO(your) allows changing of all or any of the colours over the whole or part of a screen. Selecting a part of the screen is done via cursor-set pull down windows. This is useful for altering one colour in a small area, such as the colour of a piece of text. Unfortunately, the process is made more cumbersome because an

alarming the last operation is done via the Undo menu, a window which appears on the drawing screen when the main menu is selected by pushing the middle button on the mouse.

REDO(your) allows changing of all or any of the colours over the whole or part of a screen. Selecting a part of the screen is done via cursor-set pull down windows. This is useful for altering one colour in a small area, such as the colour of a piece of text. Unfortunately, the process is made more cumbersome because an

"alternative" colour has to be selected for all eight colours every time REDO is used, even where only one colour is actually going to be changed.

COPY allows areas of the screen to be freely transferred, duplicated and saved individually as files for future use. This includes an INVERSE function so that you can discard one colour, such as an unwanted background, from a block before you move it.

The manual refers several times to the fact that ARICE uses all the available memory on an unexpanded QL, but this fact notwithstanding I would still have liked to see some status information, for instance, ink number and a y's cursor position, on the drawing screen to save a lot of clicking and cursor-leaping about.

Fast graphics, slowed down by the select procedures - but I still found ARICE enjoyable and straightforward to use, even though the manual is like a figure puzzle. (The manual index gives eight entries, all concerning the mouse, in the first three pages, and only two entries for the other twelve pages!) And at £14.95 it is good value and an attractive addition to ICE and the WICE. There is also the non-mouse version which only minor differences to the mouse one - ideal if you have a talent for drawing curves with the cursor key! **Editor: Eddcraft, The Office, Hall Farm, North Debenham, Ipswich.**



elimination, which only works fully for single convex polygons. Counting the vertices and storing the co-ordinates is a tedious process, but since this is done the hidden line function can be toggled. According to the handbook, a choice is a single convex polygon and a jet aircraft isn't, so the hidden lines work less well for more complex drawings. Hidden lines can be selected, viewed and saved by stages, which assists in reaching the desired effect without fouling up.

Finished drawings can be saved as three-dimensional co-ordinate files, and printed out as they appear on the screen from the B menu. A reasonable amount of information is given on printer control codes in the handbook, with examples for

Epson codes. On-screen images can also be saved to a machine code subdirectory for use with other SuperBasic programs, and detailed instructions are given for doing this.

Viewpoint is not a professional CAD package. There is no facility for devising your own library shapes for inclusion in other drawings, and the grid calibrations are not accessible to the nearest micron, hence from my electrical drawing department, and serve him right for being a cheapie, because you can't buy that sort of package for less than several hundred pounds.

Viewpoint is very neat and tidy, the screen resolution is good even on my low-resolution screen, and the handbook has been written with great thoughtfulness and so far as I can see very few and very trivial mistakes.

This original version of Viewpoint from November 1985 is loaded into a permanent memory position, but Eddcraft tells me that there is a newer version which will also alongside other programs in the QL's memory. **Price: Cambridge £18.95, plus £20.00.**

Supplier: Eddcraft Micros, 11 Bessmerdale Road, Sheffield S7 2BA.

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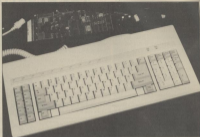
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HELEN ARMSTRONG
REVIEW'S THE
LATEST QL
REPLACEMENT
KEYBOARD, AND
CONCLUDES THAT
DIGITAL
PRECISION'S
IBM-TYPE UNIT MAY
WELL BE WORTH
THE MONEY



CHAIRMAN OF THE BOARDS

The QL is a natural for a replacement keyboard - many of its full travel keys seem to have a one-way ticket, the resulting black holes remaining as sharp-edged (pleasant) traps for unwary fingers, transforming the would-be touch typist into a frustrated switch typist.

A/C Electronic's Deluxe keyboard, marketed by Digital Precision, is an extension (rather than a replacement) keyboard. The Deluxe started its design life as an IBM PC-XT device, which means that, with the interface provided by DP, your QL is geared with a professional quality keyboard.

There are ten function keys to the right of the main keypad, which correspond to F1-F5 and SHIFT F1-F5 on the QL, and are also user definable. On the left of the keyboard is a standard numeric keypad complete with scrolling lock on the 5. And there is - sit job - a backspace key which deletes the character to the left without using CTRL. The whole unit is about 29mm high, and there is a pair of strong integral fold-down supports at the back of the base for better keyboard tilt. And they won't fall off.

The key feel is fairly light but not loose or spongy, and so bounce. Trying it for speed, I found that the screen input kept up with the fastest typing speed I could manage, and stopped when I stopped. Freddy Vachita of DP was prepared to be a bit less than my partner, smacking the keyboard vigorously with the flats of both hands a few times. The input got well ahead of the screen, but the buffer coped

admirably and spent the next 20 seconds or so quietly catching up.

The Deluxe keyboard was a valiant attempt, but it costs thousands just to set up a mould for injection moulding, so they have had to opt for vacuum moulding. Why make the thing yourself when you can buy a high quality, industry standard injection moulded keyboard from someone who already has a production line, and concentrate on the interface?

Installation is not difficult, but it requires a certain amount of care. Having opened the QL, ribbon cables which connect the present QL keyboard must be disconnected and the 30-legged 9048 must be eased gently out of its multiview socket and the new chip carrier, an integral part of the interface, carefully located in the socket without misaligning and bending any of the legs. Once correctly located and driven firmly home, the 9048 goes back into the new socket, and the interface becomes a permanent part of the computer. The interface board is designed to fit over and around the present components without bending anything aside, and with or without the aluminium plate under the keyboard in place.

The interface goes through any available port or a purpose-cut slot in the case - the 8008 port is recommended, as there is a plastic pillar just inside round which the cable can be made fast before fixing the connector in place.

The new lead connects via a 4 pin DIN socket to the corresponding plug on the end of a coiled lead, to the keyboard.

Apart from the aforementioned keys, there are one or two which do nothing (a by-product of their IBM-style provenance). The Sys key key locks out the keyboard input. A full system reset can't be done from the extension keyboard, as the RESET button on the QL acts directly on the internal hardware. All the QL's characters are supported. Caps lock and Number lock (for the keypad) both have LED ON indicators.

The draft of the user documentation which we saw is well up to normal DP standards of obsessive detail, including instructions for ridding yourself of static before opening the QL, and advice about what to do if an excess of perpendicular causes overburning in the QL, including an offer to replace the voltage regulator as a lasting solution. This is sound practice for anyone with a QL or a Spectrum, incidentally, and in the QL it doesn't even require soldering.

DP stresses the Deluxe's full compatibility with QDOS and with all makes of the drives, memory expansions, printer interfaces, mice, etc. With the keyboard which is available in Mark II, as well as the usual beige/grey, they are also giving away a Ciga Basic cartridge.

Despite Bags Systems' plans to launch cheaper QL replacement keyboards, it may well be that if you want the best the Deluxe keyboard may be the one for you. ◀

Price: £88.95.
Supplier: Digital Precision, 212 The Avenue, London E16 6SE, 01-522 5485.

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Spectrum Rom Calls

Russell Thomas

Most of the System Variables are detailed along with 2 editing commands.

Editing commands

Now something purely for 128 owners. These extra editing commands available with the keypad can be found on the keyboard. I've compiled a list but if you know of others then let us all know.

23656 FLA000	POKE 23656, 8-CAPS LOCK ON/OFF
23660 DF 52	Size of the lower part of the screen.
23662 S TOP	The No. of the line which will appear at the top of the screen in scrolling.
23670 S000	The starting point for RND, its value is set by the RANDOMISE command.
23672 FRAMES	Three byte frame-counter that counts the number of frames sent to the TV since power up. To POKE a three byte number use the following: POKE A+55,257*P23670+(1+256*P23671+8) where X is the starting address.
23675 P POSN	Redundant (?) column number of printer position. Kempston use this location to set the printing width (wz) for their Commodore II interface.
23681 YCURSR	That's right it's empty, use it for anything you like.
23682 SCR CT	Scroll counter. If you want to stop "scroll" being printed, use POKE 23682, 255 in your main loop.
23726 YCURSR	Another empty one, although only due to a nice little bug in the Rom.
23736 SAPH	Not really a DV although POKEing it with 10h prior to saving a program, stops the start message and instantly saves the program. Great for saving disks and tapes of data.
Worth a mention	MAP=POKE+PROGRAM LENGTH

POK=GRAPH MODE, OS=OSMS SHIFT, CX=EXTENDED MODE)	
0A F	move to top of last page
0A B	move to top of first page
0A E	move to end of current line
0A F	move to start of current line
0A Z	switch screen format
0B 1	move down half page
0B 6	move to end of current line
0B W	delete to end of current word
0B E	delete previous word
0B K	delete from cursor to start of line
0B T	move to top of last page
0B 1	move to previous word
0B J	delete from cursor to end of line
0B H	move to top of first page
0B P	move up half a page
0X32 0	move to start of line
0X32 0	switch screens
0X32 J	move to start of next word
0X32 K	delete char under cursor

Some of these commands allow you to do a little editing to fix. The manual is incorrect when it says you will not be allowed to leave an incorrect line. For instance, if you have

just deleted half of a perfectly good line, if you use ED to and then return, your original line will still be there! This can work the other way around of course, if you have just

edited out a bug in a line and fail to press enter and use CX H instead, your new line will be forgotten and your old line put back.

PROGRAMMING: C64

Expanded Characters

Robin Davies

When displaying text on the Commodore 64 you are stuck with a standard size character set. The

following routine will allow you to print text at double width, making each letter 8x16 pixels wide. The program is written entirely in Basic so adding it to programs of your own should prove to be easy.

10 REM EXPANDED CHARACTERS	27 DATA 10,15,22,27,14,32,24,21,22,27
11 REM FORESSZTE,21 - NORMAL CHARACTERS	28 DATA 25,17,20,25,17,10,32,22,17,21
12 REM FORESSZTE,22 - EXP CHARACTERS	31 REM
13 REM	32 E=C: F=12744
14 R=53248 REM HIGH POKE LOCATION	33 FORE=C*102 REM LINES TO PRINT
15 D=1324 REM TOP SCREEN LOCATION	34 FORG=1020 REM NUMBER OF LETTERS
16 C=25276 REM TOP COLOUR LOCATION	35 FORE1,55 FORE2=5324,1
17 FORER4=32,0 REM BORDER BLACK	36 FORE=102: FORE=2+H*48, 1
18 FORER4=33,0 REM SCREEN BLACK	37 FORE=C+G+H*48, 1 : E=E+1 : NEXT H
19 PRINT "C" REM CLEAR SCREEN	38 NEXT I : FORE=5324, 8 : FORE1, 55
20 FORER4=24,25 REM EXPANDED ON	39 FORH=1020 : H=FORE: G=(148+H)
21 REM	40 FORJ=1020 : J=FORE: H=H+1 : NEXT J, H, G
22 REM NUMBERS BELOW ARE CODE NUMBERS	41 FORE1, 55 : FORE=5324, 1
23 REM FOR THE LETTERS C=6, 24=0 ETC.)	42 D=D+120 : E=C+120 : NEXT D
24 REM	43 FORH=1020: H=H+1 : PRINT "C"
25 DATA 25,24,16,21,14,25,24,32,23,22	44 FORE=5327,22 REM EXPANDED OFF
26 DATA 21,10,21,20,25,25,13,13,32,24	
27 DATA 25,13,15,22,25,15,15,32,32,32	
28 DATA 10,40,20,40,23,40,32,22,25,32	

READY.


```

1=100000 I,1,100000:FOR n=1 TO 10 STEP
1
600 FOR q=q/a,1:PRINT CHR(143):NEXT
1,q
620 FOR i
640 TAB(7)PRINT CHR(123);CHR(10);CHR(10);
CHR(143):CHR(10);CHR(10);
CHR(143):CHR(10);
660 :
680 :
700 :
720 :
740 :
760 :
780 :
800 :
820 :
840 :
860 :
880 :
900 :
920 :
940 :
960 :
980 :
1000 :
1020 :
1040 :
1060 :
1080 :
1100 :
1120 :
1140 :
1160 :
1180 :
1200 :
1220 :
1240 :
1260 :
1280 :
1300 :
1320 :
1340 :
1360 :
1380 :
1400 :
1420 :
1440 :
1460 :
1480 :
1500 :
1520 :
1540 :
1560 :
1580 :
1600 :
1620 :
1640 :
1660 :
1680 :
1700 :
1720 :
1740 :
1760 :
1780 :
1800 :
1820 :
1840 :
1860 :
1880 :
1900 :
1920 :
1940 :
1960 :
1980 :
2000 :

```

We want your programs!!

Yes, this is your chance to get rich and famous. Well, famous anyway, as Popular Computing Weekly is looking for contributors to the Programming pages.

What sort of thing are we looking for? You name it - anything original from games to utilities, applications and the like, written in Basic, machine code or anything else you can think of.

Programs for any computer will be considered, not just the old faithful

Spectrum, Amstrad, QL, Commodore, etc., so send those listings in. What we need is a working copy of the program on tape or disk, plus an accompanying article or documentation that you would anticipate going with the piece, namely not over 3000 words.

Alternatively, send us your short programs in the Bytes and Pieces page - what could be easier?

In return, we'll pay the princely sum of £25/page for the main programming

pages and £10 for each Bytes & Pieces contribution we publish. Plus the fact that your name will be indelibly carved in the Popular Programming Hall of Fame in the immortal. What more could any true programmer ask?

Just send your masterpieces in to Duncan Evans, Technical Editor, Popular Computing Weekly, 12-13 Little Newport St, London WC2E 6PP and we'll forward them post haste.

Magic Maze

Mark Weatherill

Magic Maze is an arcade game spread over 13 screens, each of which contains a number of items which you need to collect to finish the game. It's not that easy though as some screens are guarded by vicious creatures which will drain your life energy.

One screen will need to set Page to 8/100 before typing in the longer listings and, instead, running the program. Just watch the final statement of the listings.

If you can't bear the wait then send £2.00 (enclosed) to 18 Kingsland, Aylesbury, Bucks HP21 2DT.

```
2000:mode=180:CP111:000:clear:RTS
2001:aa:173:1:270
2070:2000
2080:33:25:10
2090:20:20:CP11:000:111
2100:20:20:100:117:100:50
2110:111:100:0:CP1250:000:top
2120:20:100:top:120:50:50
2130:top:100:0:CP1250:000:100
2140:20:20:0:100:100:120:50
2150:100:100:0:CP11:000:111
2160:20:20:0:100:100:120:50
2170:111:0:RTS
2180
2190:top:100:0
2200:0:0:100:0:0:100:111
2210:100:100:100:0:CP14:000:000:top
2220:100:100:100:0:100:100:100:111
2230:100:100:100:0:100:100:100:111
2240:100:100:100:0:100:100:100:111
2250:100:100:100:0:100:100:100:111
2260:100:100:100:0:100:100:100:111
2270:100:100:100:0:100:100:100:111
2280:100:100:100:0:100:100:100:111
2290:100:100:100:0:100:100:100:111
2300:100:100:100:0:100:100:100:111
2310:100:100:100:0:100:100:100:111
2320:100:100:100:0:100:100:100:111
2330:100:100:100:0:100:100:100:111
2340:100:100:100:0:100:100:100:111
2350:100:100:100:0:100:100:100:111
2360:100:100:100:0:100:100:100:111
2370:100:100:100:0:100:100:100:111
2380:100:100:100:0:100:100:100:111
2390:100:100:100:0:100:100:100:111
2400:100:100:100:0:100:100:100:111
2410:100:100:100:0:100:100:100:111
2420:100:100:100:0:100:100:100:111
2430:100:100:100:0:100:100:100:111
2440:100:100:100:0:100:100:100:111
2450:100:100:100:0:100:100:100:111
2460:100:100:100:0:100:100:100:111
2470:100:100:100:0:100:100:100:111
2480:100:100:100:0:100:100:100:111
2490:100:100:100:0:100:100:100:111
2500:100:100:100:0:100:100:100:111
2510:100:100:100:0:100:100:100:111
2520:100:100:100:0:100:100:100:111
2530:100:100:100:0:100:100:100:111
2540:100:100:100:0:100:100:100:111
2550:100:100:100:0:100:100:100:111
2560:100:100:100:0:100:100:100:111
2570:100:100:100:0:100:100:100:111
2580:100:100:100:0:100:100:100:111
2590:100:100:100:0:100:100:100:111
2600:100:100:100:0:100:100:100:111
2610:100:100:100:0:100:100:100:111
2620:100:100:100:0:100:100:100:111
2630:100:100:100:0:100:100:100:111
2640:100:100:100:0:100:100:100:111
2650:100:100:100:0:100:100:100:111
2660:100:100:100:0:100:100:100:111
2670:100:100:100:0:100:100:100:111
2680:100:100:100:0:100:100:100:111
2690:100:100:100:0:100:100:100:111
2700:100:100:100:0:100:100:100:111
2710:100:100:100:0:100:100:100:111
2720:100:100:100:0:100:100:100:111
2730:100:100:100:0:100:100:100:111
2740:100:100:100:0:100:100:100:111
2750:100:100:100:0:100:100:100:111
2760:100:100:100:0:100:100:100:111
2770:100:100:100:0:100:100:100:111
2780:100:100:100:0:100:100:100:111
2790:100:100:100:0:100:100:100:111
2800:100:100:100:0:100:100:100:111
2810:100:100:100:0:100:100:100:111
2820:100:100:100:0:100:100:100:111
2830:100:100:100:0:100:100:100:111
2840:100:100:100:0:100:100:100:111
2850:100:100:100:0:100:100:100:111
2860:100:100:100:0:100:100:100:111
2870:100:100:100:0:100:100:100:111
2880:100:100:100:0:100:100:100:111
2890:100:100:100:0:100:100:100:111
2900:100:100:100:0:100:100:100:111
2910:100:100:100:0:100:100:100:111
2920:100:100:100:0:100:100:100:111
2930:100:100:100:0:100:100:100:111
2940:100:100:100:0:100:100:100:111
2950:100:100:100:0:100:100:100:111
2960:100:100:100:0:100:100:100:111
2970:100:100:100:0:100:100:100:111
2980:100:100:100:0:100:100:100:111
2990:100:100:100:0:100:100:100:111
3000:100:100:100:0:100:100:100:111
```

```
31000:PF000:0:0
31100:aa:10:10:0:0:0:0
31200:aa:10:10:0:0:0:0
31300:aa:10:10:0:0:0:0
31400:aa:10:10:0:0:0:0
31500:aa:10:10:0:0:0:0
31600:aa:10:10:0:0:0:0
31700:aa:10:10:0:0:0:0
31800:aa:10:10:0:0:0:0
31900:aa:10:10:0:0:0:0
32000:aa:10:10:0:0:0:0
32100:aa:10:10:0:0:0:0
32200:aa:10:10:0:0:0:0
32300:aa:10:10:0:0:0:0
32400:aa:10:10:0:0:0:0
32500:aa:10:10:0:0:0:0
32600:aa:10:10:0:0:0:0
32700:aa:10:10:0:0:0:0
32800:aa:10:10:0:0:0:0
32900:aa:10:10:0:0:0:0
33000:aa:10:10:0:0:0:0
33100:aa:10:10:0:0:0:0
33200:aa:10:10:0:0:0:0
33300:aa:10:10:0:0:0:0
33400:aa:10:10:0:0:0:0
33500:aa:10:10:0:0:0:0
33600:aa:10:10:0:0:0:0
33700:aa:10:10:0:0:0:0
33800:aa:10:10:0:0:0:0
33900:aa:10:10:0:0:0:0
34000:aa:10:10:0:0:0:0
34100:aa:10:10:0:0:0:0
34200:aa:10:10:0:0:0:0
34300:aa:10:10:0:0:0:0
34400:aa:10:10:0:0:0:0
34500:aa:10:10:0:0:0:0
34600:aa:10:10:0:0:0:0
34700:aa:10:10:0:0:0:0
34800:aa:10:10:0:0:0:0
34900:aa:10:10:0:0:0:0
35000:aa:10:10:0:0:0:0
35100:aa:10:10:0:0:0:0
35200:aa:10:10:0:0:0:0
35300:aa:10:10:0:0:0:0
35400:aa:10:10:0:0:0:0
35500:aa:10:10:0:0:0:0
35600:aa:10:10:0:0:0:0
35700:aa:10:10:0:0:0:0
35800:aa:10:10:0:0:0:0
35900:aa:10:10:0:0:0:0
36000:aa:10:10:0:0:0:0
36100:aa:10:10:0:0:0:0
36200:aa:10:10:0:0:0:0
36300:aa:10:10:0:0:0:0
36400:aa:10:10:0:0:0:0
36500:aa:10:10:0:0:0:0
36600:aa:10:10:0:0:0:0
36700:aa:10:10:0:0:0:0
36800:aa:10:10:0:0:0:0
36900:aa:10:10:0:0:0:0
37000:aa:10:10:0:0:0:0
37100:aa:10:10:0:0:0:0
37200:aa:10:10:0:0:0:0
37300:aa:10:10:0:0:0:0
37400:aa:10:10:0:0:0:0
37500:aa:10:10:0:0:0:0
37600:aa:10:10:0:0:0:0
37700:aa:10:10:0:0:0:0
37800:aa:10:10:0:0:0:0
37900:aa:10:10:0:0:0:0
38000:aa:10:10:0:0:0:0
38100:aa:10:10:0:0:0:0
38200:aa:10:10:0:0:0:0
38300:aa:10:10:0:0:0:0
38400:aa:10:10:0:0:0:0
38500:aa:10:10:0:0:0:0
38600:aa:10:10:0:0:0:0
38700:aa:10:10:0:0:0:0
38800:aa:10:10:0:0:0:0
38900:aa:10:10:0:0:0:0
39000:aa:10:10:0:0:0:0
39100:aa:10:10:0:0:0:0
39200:aa:10:10:0:0:0:0
39300:aa:10:10:0:0:0:0
39400:aa:10:10:0:0:0:0
39500:aa:10:10:0:0:0:0
39600:aa:10:10:0:0:0:0
39700:aa:10:10:0:0:0:0
39800:aa:10:10:0:0:0:0
39900:aa:10:10:0:0:0:0
40000:aa:10:10:0:0:0:0
40100:aa:10:10:0:0:0:0
40200:aa:10:10:0:0:0:0
40300:aa:10:10:0:0:0:0
40400:aa:10:10:0:0:0:0
40500:aa:10:10:0:0:0:0
40600:aa:10:10:0:0:0:0
40700:aa:10:10:0:0:0:0
40800:aa:10:10:0:0:0:0
40900:aa:10:10:0:0:0:0
41000:aa:10:10:0:0:0:0
41100:aa:10:10:0:0:0:0
41200:aa:10:10:0:0:0:0
41300:aa:10:10:0:0:0:0
41400:aa:10:10:0:0:0:0
41500:aa:10:10:0:0:0:0
41600:aa:10:10:0:0:0:0
41700:aa:10:10:0:0:0:0
41800:aa:10:10:0:0:0:0
41900:aa:10:10:0:0:0:0
42000:aa:10:10:0:0:0:0
42100:aa:10:10:0:0:0:0
42200:aa:10:10:0:0:0:0
42300:aa:10:10:0:0:0:0
42400:aa:10:10:0:0:0:0
42500:aa:10:10:0:0:0:0
42600:aa:10:10:0:0:0:0
42700:aa:10:10:0:0:0:0
42800:aa:10:10:0:0:0:0
42900:aa:10:10:0:0:0:0
43000:aa:10:10:0:0:0:0
43100:aa:10:10:0:0:0:0
43200:aa:10:10:0:0:0:0
43300:aa:10:10:0:0:0:0
43400:aa:10:10:0:0:0:0
43500:aa:10:10:0:0:0:0
43600:aa:10:10:0:0:0:0
43700:aa:10:10:0:0:0:0
43800:aa:10:10:0:0:0:0
43900:aa:10:10:0:0:0:0
44000:aa:10:10:0:0:0:0
44100:aa:10:10:0:0:0:0
44200:aa:10:10:0:0:0:0
44300:aa:10:10:0:0:0:0
44400:aa:10:10:0:0:0:0
44500:aa:10:10:0:0:0:0
44600:aa:10:10:0:0:0:0
44700:aa:10:10:0:0:0:0
44800:aa:10:10:0:0:0:0
44900:aa:10:10:0:0:0:0
45000:aa:10:10:0:0:0:0
```

Fail Safe

Keith Irving

This interrupt driven Spectrum routine provides a secondary break facility for those machine code programmers

that find their code trapped in an endless loop. Turn it on with RANDOMIZE 65000 and off with RANDOMIZE 60010.

To break out of a program press Symbol Shift and then together to return to basic.

```

10 REM POKE "FAIL-SAFE" CODE INTO MEMORY
20 CLEAR 64999
30 FOR N=65000 TO 65000+67
40 READ X: POKE N,X: NEXT N
50 DATA 62, 253, 237, 71, 237, 74, 261, 0, 0, 0, 62, 63, 237,
71, 237, 64, 261, 0, 0, 0, 0, 0, 6, 254, 0, 0, 0, 0,
0, 229, 263, 197, 249, 255, 243, 62, 127, 219, 254,
238, 3, 40, 7, 241, 193, 269, 225, 261, 237, 77, 241,
193, 269, 225, 261, 1, 0, 120, 11, 128, 177, 32, 251,
17, 190, 20, 175, 153, 10
60 REM SAVE THE 70 BYTES OF CODE FROM ADDRESS 65000 ONWARDS
70 REM RELOAD WITH "CLEAR 64999: LOAD "name"CODE 65000
80 REM INTERRUPT ON = RANDOMIZE USR 65000
90 REM INTERRUPT OFF = RANDOMIZE USR 60010
100 REM TO CALL THE ROUTINE PRESS SYMBOL SHIFT+BREAK
    
```

Sound Sampler

Keith Irving

The Spectrum program lets you sample sound for up to four seconds. Sampled speech is reasonably intelligible but could be greatly improved by the use of an external filter.

Press R to record the sample and P to play it back again.

```

10 REM POKE "SAMPLER" CODE INTO MEMORY
20 CLEAR 64999
30 FOR N=65000 TO 65000+67
40 READ X: POKE N,X: NEXT N
50 DATA 33, 232, 128, 14, 253, 243, 6, 0, 219, 254, 7, 7, 268,
10, 14, 248, 0, 0, 0, 0, 114, 35, 124, 165, 194, 236,
258, 261, 261, 0, 33, 252, 129, 14, 253, 50, 73, 92,
15, 15, 15, 238, 7, 95, 243, 124, 15, 15, 15, 87, 6, 0,
123, 177, 211, 254, 263, 10, 14, 248, 35, 124, 165,
194, 21, 254, 251, 261
60 POKE 25050,0: CLG
70 PRINT FLASH 1:AT 11.6:"PRESS";FLASH 0:"R TO RECORD"
80 PRINT AT 13.12:"P TO PLAY BACK"
90 IF INKEYS="R" THEN PRINT FLASH 1:AT 11.12:"R": RANDOMIZE USR
65000: GO TO 70
100 IF INKEYS<>"P" THEN GO TO 90
110 PRINT FLASH 1:AT 13.12:"P": RANDOMIZE USR 65000: GO TO 70
    
```

Selective Copy

Adrian Short

This routine for the Spectrum and any ZX Printer compatible simulates the COPY command, except that it allows you to copy any part of the screen.

When reloading the routine use CLEAR 67132 first. To use the routine enter POKE 67137, top line, RCR6 67138, number of lines and then RCR6 67139 67138 to perform the copy.

```

10 REM XXXXXXXXXXXX
20 REM BY A. SHORT 18.4.87
30 CLEAR 67132
40 POKE 67137 TO 67138
50 RCR6 67138: POKE A,V
60 NEXT A
70 RCR6 "RELLOADER"CODE 67136:AT
80 DATA 38,0,48,31,239,124,268
,583,14,268
90 DATA 227,225,225,38,48,200,
193,213,238,64
100 DATA 8,17,0,91,1,52,0,248,8
87,70
110 DATA 210,17,244,0,25,200,24
1,31,254,0
120 DATA 194,228,225,225,268,14
,261
    
```

COMPUNET TO MOVE TO NEW MAINFRAME

CompuNet is always changing and adding new areas of interest to subscribers. Now, as Graham Edkins reports, they are preparing for their biggest change yet.

CompuNet could never be accused of being a static network, and from the very beginning it has been adding new ideas. The fact that the access software can be changed so easily by a simple automatic download of the latest code makes any innovations that much easier to implement.

CompuNet is now working on its biggest change yet, moving to a new mainframe, which means that the latest ideas are having to wait their turn. However, the new mainframe is still on schedule (at least in the computer world) for its summer launch.

As the users can create their own directories and make their own new areas, the work on the new mainframe has not affected the growth of information, special interest groups (SIGs) or programs available. In fact CompuNet seems to have grown every time that you login, so it is easy to get used to one particular area or even a few areas and miss the changes going on in others.

Routes to others are given at the bottom of each directory to encourage you to 'jump' to a different, maybe un-explored part of the network, with the touch of a function key. Alpha gates, similar to those which Prentice has just introduced, also make it easy to move around from one area to another and avoid the long slog through directory after directory.

Even with such ease of movement it's very tempting to settle down into a set pattern so I decided to take a good look around and see what's happening. In my next report on CompuNet I'll tell you what I found in the Demos area, where I concentrate on the ones that are not to be missed. This time however we'll look at some of the areas on the rest of the system, many of which are new to me, although many are old friends which deserve another look.

I would guess that most people start their on-line session by hitting GOTO in the Submenu and typing NEWS. This is where the editor of CompuNet writes about the latest new pages to see. Many of these have been given quite a short life by the

person that uploaded them and so the news itself only remains for a couple of weeks at the most and there is normally an updated news file or three times every week.

Others are very prolific in Shockwave (GOTO SHOCK) Further entertainment with a science fiction edge to a lot of it is in COSMOS where you will find well developed areas like Hitch Hikers, Astronomy and Dr Who (GOTO HHS, AS TRD & WRD).

Over in the Labyrinth De. There is everything to do with role playing games, the multi-core game MUD at source and SALLY which is a small section of MUD which can be used on uploaded messages for just 50p per hour but you will also find things like the Play by Mail directory (GOTO PBM) and the armory where Zagger gives instructions for making a magic sword or an evil Ar the word labyrinth is too long for a keyword they have given it the gate 'GARD'.

There are many places to look on the system apart from NEWS to find the latest uploads, try 'GOTOS' which is a list of page adverts of the

Chat-on-line area (GOTO CHAT) where many CompuNetters promote their uploads. NEWS gives you a good starting point for any voyage around the network and also lists many of the Alpha Gates.

All of this travelling around what has now become a very large database, considering that it is currently dedicated to only one micro, has proved too much for you, then I can recommend settling down to a good and thorough preview next in the Arena area (GOTO ARENA) where other visitors have to be given their views on such controversial topics as religion, the channel tunnel, women in computing, AIDS education and South Africa. You may well find yourself daily bound to express your own opinion by upgrading into its discussion.

I hope that there has been something mentioned on this page that will in the future be added to your own list of 'calling places'. If you can't wait until the next CompuNet article to tell you about the demos, for which CompuNet has become so well known, then I'll direct you to Demo Reviews on Page 202006 and KEY To Demo World on Page 204724.



It is very difficult for the editor to see every new upload so if you feel that your latest masterpiece deserves attention then drop a line to her on the ID FEEDBACK.

If you like your news to be about micro, hardware, software and computer peripherals then the place to look is the large (and growing) directory from JAL, it goes by the unusual title of The Electric Frog Plate, but GOTO PROG will take you straight there.

Amateur Radio enthusiasts have their needs catered for in the RADIO area, this is a Closed User Group but a small one of interest about you entry to this area started by DAPHN. Aviation news can be found in AIRCAT and other news alpha gates like MMSD and COMMS are also available. You'll probably find an area covering just about every hobby, or for that matter majority, interest that you could think of and if you don't then you can always start one!

If you prefer to be entertained instead of educated then there are a couple of other new games to try. SCAR will lead to the Vicar's Tavern from PDS2 while JT12 and

2-Bit drumkit for the ST

2-Bit Systems released a drum package for Atari 8-bit micros some time ago. Now it has revised that package to work with the ST. Mark Jenkins looks it over.

A few months ago we looked at 2-Bit Systems' drum package for the Atari 8-bit micros. Now the company has modified the package to work with the ST, and has taken the opportunity to launch several options for different musical applications.

2-Bit has also thrown in its hat with licensed, which will be distributing the ST Digidrum both here and in the States. No doubt this will give the company much wider exposure, which is bound to be a good thing.

The newly-coloured Digidrum box (it's bright purple actually, you can't miss it) contains just one disc and a handbook, and the optional Sample Disc 1 has a leaflet listing the sounds contained therein. There are 41 sounds included, which for the sake of completeness we list below:

1 Bass	15 Citar	29 Oct 2
2 Cello	16 Clarinet	30 Sax 1
3 Choir	17 Flapjack	31 Sax 2
4 Clarinet	18 Flute	32 Sax 3
5 Concert	19 Flute	33 Sax 4
6 Computer	20 Harp	34 Softbass
7 Cym	21 Herring	35 Sica
8 Cym	22 Harp	36 Tambour
9 Cym	23 Indian	37 Timpani
10 Cym	24 Looming	38 Tomtom
11 Cym	25 Machingun	39 Trum
12 Cym	26 Marrgan	40 Whistle
13 Cym	27 Mometer	41 Glass
14 Cym	28 Oct 1	

You can arrange these sounds into two complete kits - for instance, using all the B-prefixed sounds to create a 30-items kit, electronic kit, or using the funk, bush, cym, glass, and so on to create a Latin kit.

A total of 16 sounds can be loaded and there are several sounds on the main disc to start you off. Incidentally, you can run the program on a 50001 or 1040ST with a colour or monochrome monitor or TV (in the case of the 50001PM).

The instruction handbook is a little on the verbose side (in fact it's just four pages long) and is a bit repetitive in some areas. For instance, it's not strictly true that Digidrum will "turn your Atari ST into a high quality sampling drum machine".

You can't do any sampling yourself - you need the optional Replay sampling system, which has been used to create the sounds supplied, sampling at around 20K/s.

The default kit on the main disc consists

of bass, snare, tom and closed hi-hat, cowbell, 16 and high tom, low and high bongo and cym. 80 patterns can be stored and these can have between 4 and 32 beats, patterns can be entered in real time or real time and linked together to play like a song of up to 70 patterns.

To increase the possible length of a song, you can also repeat a single pattern within the song or loop a whole sequence, and of course everything can be saved to disc.



If you do have the ST Replay cartridge you can connect its phone out socket to your hi-fi - otherwise you're limited to listening to samples via your monitor. If you auto-out "Drum 999" you'll hear a demo song and you can use the alternate key to select monitor or hi-fi (via the Replay cartridge) sound output.

The package doesn't use much of the 640k environment and in fact works without a mouse. The cursor arrow keys are used to move along the top of the screen options, which are speed, tempo, edit song, play lang, add pattern, load, save and info, the last of these simply repeating some of the specification from the handbook.

Some of the terminology in the other options is very poorly chosen. What 2-bit chooses to call "speed" is actually sampling rate, which can be set to 20K/s (the highest quality or 10K/s for the largest loop. All samples are described as being "180K/s in length" - perhaps this means 10K/s?

When we do get on to what you can and might call speed - or tempo, if you like - we find that 2-bit has made it variable from one to 48. But it is 48 beats or slower than one'll walk, logically enough (?!), it's slower - the logic being that the tempo setting indicates the number of 10K/s counts taken between beats.

Edit song is a slightly more sensitive option, calling up a long list of 70 patterns together with the number of times they should be repeated and a suitable tempo. Figures are entered using the numeric keys and you have to go along a whole line, once you've reached it using the cursor keys - in other words, you have to enter the pattern number again even if you only want to change the number of times it repeats.

You can wipe a complete song using the edit song menu and have the same option on the pattern menu. Patterns are entered on a grid offering any 16 sounds mirrored against up to 16 beats. The Digidrum package can sound five voices simultaneously and these must have samples assigned to them as voice one and voice two; if you attempt to play the same channel twice then the first entry will be deleted.

Granted, the demo do show that you can score up with quite complex patterns using just two voices. If you prefer to enter beats in real time, just go to the real time option and you can enter beats by tapping F1 (or whatever sound is currently assigned to voice one) and F2 (or voice two).

You can load and save a file, a list of voices, a pattern or a song, as the method of assigning sounds to songs is quite flexible. There are a few disc size messages, mostly dedicated to announcing the fact that your disc is full, 16 samples taking 20K/s of disc space.

During playback the package sounds pretty good, and you can create long and complex songs quite quickly with reasonably bright, crisp sounds. However, I'd be very surprised if there were any musicians on the 2-bit team - the tempo assignment method of pattern entry into songs, lack of pitch control for the furred sounds, neglect of the mouse and inconsistency of the handbook are all regrettably unprofessional.

Digidrum costs £19.95 and Sample Disc 1 costs £14.95; more information from Microdeal at the address below.

Microdeal Ltd, PO Box 68, St Austell, Cornwall PL26 4JL, 0175 65020.

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 WC2N 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

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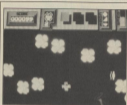
NEW RELEASES

Amstrad CPC

Program Five Star Games Type Completion **Price** £3.95 **Supplier** Newcity, 284-285 Street, Salford, Salford M6 7AD.

Detail: *Caution!* it and *Alan Highway* star with *Scramble*, *Blues* and *Playstyle* as scores.

Story: you might remember a *Factor Dreams* answer to US *Goat's* *Daunted*, programmed by Paul Jam.



It's interesting how taking a sideways look at a particular game format and just changing one single aspect it can make such a difference to the gameplay.

Jordan Joerges has taken the simple arcade adventure/maze game - and played around with the gravity and friction aspects of the movement with *Kinoko*. As your friction moves from screen to screen (there are 42 'zones' in total), instead of the constant downward pull of gravity that dominates in most games, gravity and friction vary in each room.

In one room, for instance, there are two centres of gravity - one placed on the left of the screen, one on the right - which makes manoeuvring kind of difficult. In others, intense atmospheric friction means that moving is like making your way through treacle.

It is your mission to sort out this abnormal state of affairs by collecting the three letters that spell out the 'word of power' (the mind boggles!) and then delivering them into the hands of the good scientist - wherever it may be - who will put things to rights.

As in most games of this type, things may be picked up and used to aid you - like a chemical spray that will blast away all the nasties, a deflector shield that will fend them off and beat of all, the B2 control throusthat will nullify the weird effects of the strange gravity.

You've got three lives - and as soon as your power gauge goes down to zero, that's one life gone. Some static objects will kill at the slightest contact though - so a deft touch with the joystick is essential.

Released on the full price Firebird label, written by lone West German programmer *Jordan Joerges* (aided only by a UK Spectrum), would you believe, out in Spectrum, Amstrad CPC and Commodore 64.

Kinoko is not a classic - but if you like this kind of arcade puzzle solving, it offers enough that is new to make it worth buying.

John Cook

Placed in a maze of dungeons filled with enemies, monster games stars, food, doors, keys, the game had distinctive memo graphics - rather Gothic in nature, if anything. One or simultaneous two player, it was considered a good quality title.

Alan Highway is a variation of the original *Highway Encounter* from *Videx* - it played on roughly the same themes and stuck to the same style of graphics, but was a worthy follow-up, requiring sharp shoot skills and a keen brain to succeed.

Caution! it is another follow-up, but will vary different from *Placid's* original in that you play the part of a bouncing pumpkin that to keep the very witch you controlled in *Caution!* 1. The witch's palace (where the action takes place) is big as full of hazards, traps, but at all!

Amstrad it is a game released when *Mega-Dad* was going through its middle crisis, so don't tell me that - a shame because it's one of the most arcade adventures to feature in the starting role, a *Slinky* (at least, it looks like a *Slinky*).

Lastly, *Cometstar Blues* from French company *Line Information*. This is a weird arcade adventure that has you drifting out from prison and rapping round the desert, it's quirky, visually attractive and very French.

Altogether, the five pack represents excellent value - especially considering that some of the games are over a year or so old.

Program Amstrad Type Apple **Price** £7.95 (tape), £9.95 (disk) **Supplier** US & Style Software, Moolinsway, Cheshire, Co. Galway, Ireland.

Hardware SYMMIO, wordprocessor for the CPC with a Light Code game on the top side.

Program Kinoko Type Arcade **Price** £5.95 **Supplier** Joerges Graphics, Alpha House, 10 Carver Street, Sheffield S1 4LJ.



Another *Shrek* (Shrek?) variant - it's good and another fun will get you the *Cometstar* kit if you ever manage to solve the 500 screens.

Program Alan Highway Type Arcade **Price** £8.95 (tape) £14.95 (disk) **Supplier** Ocean Software, 6 Central Street, Manchester M2 5AS.

Atari ST

Program Amstrad Type Arcade **Price** £24.95 **Supplier** US Gold.

Units 3/3 Halford Way, Halford, Birmingham B6 7AA.



Very disappointing conversion to the ST. The controls are mixed and dull, and control is via joystick only... whereas a fine side job would have used mouse control with separate mouse buttons for items and fire.

Program Bluestar Type Arcade **Price** £14.95 **Supplier** Tynesoft, Ashton Industrial Estate, Skelton upon Tyne, Tyne & Wear NE21 4TE.

Phobos and *Labyrin* on the ST, is it a lovely implementation with some great features of format as you move your intensity, character from screen to screen. Completely charming - and it's not costing an arm and a leg.

Atari XL/XE

Program Wizard's Crown Type Arcade Adventure **Price** £20.00 **Supplier** US Gold, Units 3/3 Halford Way, Halford, Birmingham B6 7AA.

Alan XL/XE also based role-playing adventure from 500, which includes a tactical combat section so the party can really get to grips with the monsters.

BBC B

Program Computer Mind Type Strategy **Price** £24.00 (disk only) - retail price **Supplier** Mission, Suite one, 4/5 The Grange, London SW18 8PS.

Two way (Mastermind) style game with you against the computer.

Commodore 64

Program Saturna Trilogy Type Arcade **Price** £3.95 **Supplier** Joerges Graphics, Alpha House, 10 Carver Street, Sheffield.

continued on page 81



10-HUT!

Activision has timed the release of Gamemaster's CFI, Championship Football, perfectly. Perfectly timing that is. With the Superbowl a fading memory and the new American Football season many months away, interest is not running high at the moment. Hopefully this will not cause against Gamemaster's product as it features a style of graphics not seen before in a game of this type.

Upshot of a three dimensional view (seen down on the ground) here you get to play the wide receiver and the running back, the rest is in the special team going for goal with time running out.

Before you get into the action, you must go through the preliminaries of selecting the number of players, which teams to use (from 26, all races different), and how long each quarter should last (four or seven minutes).

That disposed with, it's down to pitch and the hoots! After struggling to return the ball you are presented with a fairly long list of options for your first offensive play. The choice of running plays includes trap, draw, blast, pass, sweep and pitch, left or right. Trap and draw (as usually) are relied upon for small gains while the sweep and pitch options are relied on can reap greater rewards.

After selecting your choice the opposition makes theirs and you get to play it out. The quarterback goes the calls intelligently, tall stampered punting or well, and passes the ball to you. This is the moment of truth because you have to know exactly where to run to break through the noses at the line of scrimmage. If you are last a



"Having broken free, you can stamp down the field - sticking out an arm, if you time it right, to fend off the desperate tackles. Should you manage to plough your way through the defense, then the end zone looms up and the crowd starts cheering!"

couple of noses at the bottom of the screen guide you in the right direction but by then it'll be too late to make a big gain.

Having broken free you can stamp down the field winking out an arm, if you time it right, to fend off the desperate tackles. Should you manage to plough your way through the defense

then the end zone looms up and the crowd starts cheering.

The alternative to the effort of a running play is of course to throw the ball. There are a lot of 22 options (11 left, 11 right) to choose from, four short sharp passes to bombs for down-field.

The mode of operation here is to wait for the quarterback to

break punting and then execute a precise number of steps in set directions. A long out step, for example, requires his steps forward, five to the left and one back. It has to be done exactly right and at the right time otherwise what the quarterback throws the ball you won't be there to meet it. Oh, that it were that simple. You also have the defense to contend with.

While the graphics are decidedly chunky (they are presented in a clear 3D format), and the animation is quite reasonable. The sound, though, is pretty good, with the simplest sounds of the quarterback and commentator adding to the atmosphere.

With a choice of teams to play against, or a friend, Championship Football could keep you playing until the season really does start in September.

Hints box

- Until you know the pass plays off by heart, try running the ball most of the time.
- The shorter passes are easier to use, so don't try a big or post until you really need it.
- Try to out-think your opponent by working out what your opponent does in and what their response would be. Then try something different that takes advantage of their response.
- Concentrate on timing your runs in pass plays so that you start moving after the quarterback calls the play but before the direction arrow appears.
- Each team in Championship Football has weak points. Try using plays designed to exploit these weaknesses most of the time.

Duncan Sless

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4 Continued from page 48

Impressive graphics in this multi-task launch which has you (SPRG) virtual balls in order to become a Remote Worker. Three editions are available. Screenshot above play and Kevlar. Looks good.



Program Zap for Type Arcade Competition Price £1.95 (also onto Supplier Playars, History House, Central Park, Aldershot, Hants RG7 4JN.

Desktop disk software from Playars - just watch a list for two games. The best on the Commodore disc are *Playa* and *Furquel* - superb state-of-the-art, but you might like to give it a try.

Program Turn Tactics Type Arcade Fight Simulation Price £9.95 (also £11.95 (also) Supplier Doctor 307 Simulations, PO Box 95, Earl Preston, West Sussex BN28 2TZ.

Simulation that lets you link two Commodores together - giving full two player with independent views of the action.

Program Gemstone Healer Type Role Playing Arcade Adventure Price £14.95 (also only) Supplier US Gold, Units 2/3 Hatfield Way, Hatfield, Birmingham B9 7EQ.



320 report that takes the best of three type concept to the best.

Program Pass Your Dining Test Type Application Price £9.95 (also £11.95 (also) Supplier Autodesk Software, PO Box 50, 24-28 Crown Street, Heading, Berkshire.

Learning program based on the book, "Are you ready for your Dining Test?" by Mike Partridge - prepared to the best setting, "Then please start your engine and turn left at the lights."

Program Kings of Zulu Type Role Playing Arcade Adventure Price £9.95 (also only) Supplier US Gold, Units 2/3 Hatfield Way, Hatfield, Birmingham B9 7EQ.

Hope quest for mystic King looks like it has tremendous depth to it, but also it appears to be blocked out by the graphics.

Program Stard of Spring Type Role Playing Arcade Adventure Price £9.95 (also only) Supplier US Gold, Units 2/3 Hatfield Way, Hatfield, Birmingham B9 7EQ.

Party based roleplaying with tactics bits, all involved in a tactical quest.

All this newly arrived 320 still isn't bad, but it was generally agreed that the *Band's Tale* (Bantam) *Arts* is still the best 1987 system on the 64.

Program Fuel Computer into Type Competition Price £9.95 (also) Supplier Data-Job, 25A-26L Street, Regent, Surrey RG2 3AD.

Heaven - it doesn't know *Killer* - but what a bit.

Program Aquap Trepser Type Arcade Price £9.95 (also) £14.95 (also) Supplier Playars, 4 Little Essex Street, London WC2R 3LP.



The generic entrepreneur reaches the Commodore 64 at last.

Program Magic Shatters Type Arcade Price £9.95 (also) £13.95 (also) Supplier Ocean Software, 8 Centre Street, Manchester M2 5HD.

Con-up conversion of a Nintendo

game of 1984 vintage. It involves platforms, and 32000. You knock out the bunnies then kick into *Crabs* and *Figures* *Fly* also make an appearance.

Oh if you like that sort of thing

PC and Compatibles

Program The Fourth Protocol Type



"They said it couldn't be done - but we did it!" So said one Richard Kape of Software Creations, one of the up and coming newer software outfits, with the boastful grin on his face. Richard is a happy man, and playing *Sentinel* on the Spectrum, you can see why.

The thing has been done by Software Creations as well as it possibly could have been on that format and has given thousands of Spectrum owners the chance to experience what the computer press in general have been raving about since last autumn, when the BBC version was released.

In case you missed any one of the several rave reviews in *Popular* (hat, hat), *Sentinel* is an abstract game of conflict set in a *Marble Madness* style environment - but instead of looking on from outside the landscape, you are dramatically placed right inside it. Your opponent is a figure placed on a plinth high above the stark surroundings - the sentinel.

The game is all about energy. Your ultimate task on each level (and there are 18,000, yes, ten thousand) is to destroy the sentinel by absorbing his energy. To do this, you must find a way to get higher than it. To do that, you have to create stacks of boulders (costing you two energy points each), then create a new robot "being" and transfer yourself into it.

You now absorb your old self (gaining three), and look for trees to absorb (plus one) to replenish your energy supplies to make your next move. All the time this going on, the sentinel is slowly rotating like a steady lighthouse, draining energy from you if you should fall within its gaze. Get the idea?

With a single sentinel, it's a stimulating exercise in three-dimensional visualisation, when there are six - it's blind panic.

Of the four existing versions, *Armored ORC* is probably the best, but the more display on the Spectrum (and you can change that colour at will) is pleasing enough and well drawn.

In all, it's a great little implementation of Geoff Crammond's original - highly recommended for anyone that's finding the jumpy-jumpy, shooty-shooty a little bit tedious.

John Cook

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SPECIAL OFFER REFERENCE - POP 107

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who plan to detonate a nuclear device in mainland Britain.

I set it to a level - and was bombarded with phone calls for the next week. Consequently, it's addictive.

Spectrum

Program Army Moves Type Arcade
Price £7.95 **Supplier** Imagine Software, 6 Central Street, Manchester M2 1PL



Program Chess Type Arcade
Adventure Price £1.99 **Supplier** Phoenix Sales, 74 New Oxford Street, London WC1

3D perspective arcade adventure - not best for under-16s squad.

Program Pass Your Driving Test Type Application Price £7.95 **Supplier** Autogame Software, PO Box 66, 34-38 Crown Street, Reading RG1

See Commodore 64 listing for comment.

Program Think Type Strategy
Price £1.99 **Supplier** Phoenix Sales, 74 New Oxford Street, London WC1



Old Android file, if you haven't already got it, buy immediately. It's a very clever variant of Clue and 4, and will stretch the brain without straining the pocket. See

Program Politics Type Strategy
Price £9.95 **Supplier** CDS, 14 Langton Way, Bournemouth, Dorset BH2 7TL

Two turns from the American Civil War - Gettysburg and Chancellorsville. Uses the recently developed Corps Commander system and features movement. What more do you want from a wargame?

Program Red Squadron Type Arcade
Price £9.95 **Supplier** Quicksilver, Angel Press Publishers, Victoria House, Lambour Place, London WC2E 7PL

Vector graphics shooter with a considerable number of hits. The Red Squadron is the code name for your Multitask Infantry Combat Capsule - and as a Ferrari Star Commander you have to take out the evil planes, collect the goodies and buy hot food.

Looks OK - but fun isn't everything.

Program Mega Bombers Type Arcade
Price £7.95 **Supplier** Ocean Software, 18 Central Street, Manchester M2 1PL



See Commodore listing for comment.

Program World Games Type Sports Simulation
Price £9.95 **Supplier** UK Gold, Unit 2/3 Heddon Way, Huddersfield, West Yorkshire WF1 1LQ

Tight sports to compete in around the world, with lots of local colour. Weightlifting in Russia, Sums Wrestling in Japan, Car Driving in Mexico, etc.



Program Fun For Games Type Compilation
Price £9.95 **Supplier** New July, 204 South Street, Margate, Surrey TN12 1AG

Includes Quaxxon, Alan High

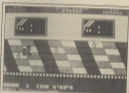
July and Quaxxon at three very cheap prices.

Quaxxon was always a particular favourite of mine, written by Steve Turner - with a little inspiration from his long-time partner, Mike, and 64 programmer Andrew Braybrook. In fact, Quaxxon is a 3D version of Pacemate, a cooperative combination of arcade and strategy.

Program Fun Computer Arts Type Compilation
Price £9.95 **Supplier** Funsoft, 254 Red Street, Margate, Surrey TN12 1AG

An interesting mix on this one - 4x4x4 Tetris, Tetris, Mantris, 2048, Startris 2 and Wizard's Cat.

Top Twenty charts will return next week



Metropolis is one of the recent arcade conversions of which I have not had the pleasure of playing the finance original. This, at least, has the advantage that the game can be criticised in its own right rather than in terms of how well it has been converted. On these grounds, it's top. At £24.99, though, the ST version is pricey.

Neither like Boulder or Trailblazer, Metropolis is set in a surreal landscape of chess-board squares and hallucinatory hazards, and your task is to speed through the landscape without being obliterated. In this case the screen scrolls horizontally, your player is a little cater-stroke, and there are twenty-four levels to complete.

Racing against a timer, you have to avoid hazards including pits, rolling formations of Coke cans, giant washers, rotating cubes, rats which taste themselves to your shoulders and have to be shaken off, green squares which slow down your progress, and exploding mantraps. To aid you there are skateboards which can increase your speed, trampolines which allow you to leap long distances (if your timing with the fire button is correct) and cars which can be locked or jumped on to gain points or slow the time.

Prober's conversion is colourful, fast, and very playable. Like many ST games, the scrolling seems to flicker when there are a lot of animated objects on the screen, but it's nothing serious. Good use is made of the ST's graphics, though the sound and music are average.

Commodore 64, Spectrum and Amstrad versions forthcoming. It will be interesting to see how they measure up to the excellent ST version.

Keep it simple

I was rather disappointed — to say the least — when I found that my copy of *Leather Goddesses of Pornography* doesn't contain an inflatable doll for the masculine first, of course. It's the least one could expect from such a lewd and lecherous game. Not even a whiff of leather pants!

Instead, I had to content myself with a pair of 3D glasses, a scratch-in soft case and a 3D comic, which made my eyes go cross-eyed whether I was watching the space or not. As for the scratch-in soft case, I just made me feel nauseous. Such is life.

Though *Leather Goddesses* is typical of Interocean adventures, it also represents a distinct trend in computer games: No sooner do you open a computer game's package these days than a miscellany of accessories makes the less generous would say "garbage" leap out of it.

Sometimes beneath the capricious playguide, the non-on logo, the 40-speed controller, you eventually find the cassette or disc — yes, that's right, the reason you bought the package in the first place.

Woe betide you, however, if you're over foolish enough to expect everything to go back in the box just as you found it. The package designers, it's clear, go to amazing lengths to ensure that what they include in the package automatically expands an opening. Consequently, it's just about impossible to get everything back in!

Take *John Cougar's Football Follies*, for example. The board is a brilliant piece of lateral thinking. But after one has divided off the plays coach where the ball does one put them?

And if it's not novelty it's novelty, the love free Rambler, for example, is as fast of New Rambler adventures are some of the best, but their novelty? Pass me the waste paper bin quickly.

What's even more infuriating is that you have to flip through these large literary impediments just to get into the game. (Come back, Lemuel, all is forgiven.)

So the question that must be addressed to the computer games industry is this: Are all these extra bits and pieces really necessary?

The answer is found to be ambivalent. In Hollywood hijinks (one of Interocean's more recent adventures), for example, enclosed in the package is a letter from Aunt Hidegarde and a signed photo of the famous Freddy Burbank. But what one is supposed to do with the plastic tree that is also included — stick it in a cocktail?

Some would argue that such material helps to give credence to the fictional world of the game, and there's a certain amount to be said for that. Such material definitely helps some players feel their way into their assigned role. But without novelty or rewards would it not be possible to buy these already expensive games that much cheaper?

The fact is, whether *Leather Goddesses* contains a blow-up-doll or not, it's the game itself that gives value for money and not all the accessories that come with it.

Julia Runciman



Puzzle No. 256

James was investigating the properties of "nearly equilateral triangles." A "nearly equilateral" triangle is one in which the sides, instead of being equal in length, differ by just one unit. In addition, he was only interested in those triangles that had an area of an exact number of square units.

The smallest such triangle, therefore, is one with sides of 3, 4, and 5 units, and an area of 6 square units. But surely, you will agree, a triangle with such dimensions is nowhere near an equilateral triangle!

To this argument James would agree, but the next largest triangle in the series, and remember we are only interested in those triangles with areas of an exact number of square units is one with sides of 13, 14, and 15 units. By the time we reach the third triangle in the series, having sides of 51, 52, and 53 units, only odd measurement would differentiate it from a true equilateral triangle.

Can you determine the fourth triangle in the increasing series?

Solution to Puzzle No. 254

Jim was born in 1949, when Bill was 26 years of age. Bill's birth year was in 1913, when the latter, Jim, was also 26. Therefore Jim was born in 1877.

Starting with the current year as Jim's year of birth, Bill's age is calculated using the loop M. All possible ages are then substituted from Jim's date-of-birth to find Bill's date of birth. This step is then tested in the subroutine for primality. If it passes this test, the procedure is repeated with all possible "larger" ages for Jim.

The first set of figures with all dates prime and both differences square are printed out.

Winner of Puzzle 251

The week's winner is Helen, Tracy, of Chester, who will receive \$10.

Notes

The closing date for Puzzle 256 is May 26. Answers should include a program listing if possible.

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HACKERS

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or Commodore 64. Ideally you will already have completed at least one game, preferably arcade-style, but (at the very least) be able to demonstrate a degree of knowledge.

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