

PERSONAL COMPUTER

weekly **NEWS** JULY 28 • 1984 • No 71 50p

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WITH THE
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COMMODORE 64



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Please indicate programs required

- ☐ Loco
- ☐ Son of Bagger
- ☐ Guardian
- ☐ Bugblaster
- ☐ Bagger
- ☐ Panic Planet
- ☐ Eagle Empire
- ☐ Contract Bridge

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REGULARS

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Readers letters — and we pay for the best. This week, points of view concern Amstrad, Commodore, Dragon and Newbrain.

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More hints and tips for the popular machines, courtesy of our generous, sharing, caring readers. (We pay 'em a fiver each too.)

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One club is tuning into the world, thanks to a combination of computers and radios.

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Last but not least, enjoy a chuckle at the less-than-sensible side of computers.

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Secret Spectrum 18

Get a little protection for your programs and data with Kevin Ball's password facility.

Adventure 20

Once more our intrepid explorer Mike Gerrard takes up axe and rusty lantern and sets off in search of glory and enlightenment.

MENU

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No 71



Cover photograph by Jay Myrdal

COVER STORY

Aquarius reborn 28

After a troubled start in life — low sales and manufacturer Mattel's pull-out of the micro market — the Aquarius found a new home with Radofin. Now its successor, the Aquarius II has emerged with a real keyboard, more memory and an eye on the Spectrum/Vic 20 market. David Guest evaluates its chances.



Competition Five Commodore 64s must be won

In a touch of summer madness, PCN is giving away five best-selling Commodore 64s. In this free, easy-to-enter competition you can stake your claim to one of these great machines by answering six questions. Turn to page 12 for details.

Vic revisited 22

It's getting long in the tooth but there's life in the old Vic yet. Peter Worlock starts an occasional series on this venerable micro with a look at the keyboard — your first point of contact.

PERIPHERALS

The plot thickens 28

Hard copies of your colourful graphics are just a step away with this colour flat-bed plotter for the IBM and all Centronics machines.

Beeb in store 26

Mass storage for the BBC Micro from Ikon with its successor to the popular Hobbitt fast tape drive. Cheaper than disk, faster than cassette.

SOFTWARE

Spectrum Sci-file 38

Turn your Sinclair into a businesslike data storage system with this double package.

64 art school 35

Artistic graphics are obviously the year's major subject for the Commodore 64. Yet another offering is Paintpic from Kuma — but this one would make an Old Master sit up and take note.

GAMEPLAY

BBC 43

Never let it be said PCN doesn't give you a choice: this week, take the controls of a Spitfire, or head off in search of hidden treasure. Aviator and Flint's Gold are the games in question.

Atari 44

More gold awaits discovery — this time it belongs to Captain Sticky. Alternatively, take to the air (sounds familiar...) in Flak.

PROGRAMS



Oric/Atmos 40

You money-grabbing lot. Even more gold but this time you're going to have to work for it. A cross and a stake might come in handy too, 'cos there's a vampire keeping watch on this stash.

Oric price rise

By John Lettice

Oric has raised the price of the Atmos by £20 to £190 and ended its TV advertising campaign. In a summer that has already seen such computer casualties as Dragon, Computers and Imagine, this promptly had the vultures circling.

However, Oric's finance director Allan Castle has denied any serious financial problems at the company. He claimed Oric sales of around £2 million a month and said there was no question of Oric being unable to pay its debts.

The price rise is liable to be seen as something of a false move by Oric. A spokesman said it was due to the worsening sterling/dollar exchange rate forcing up the price of components, and Oric says the Atmos is 'still £10 cheaper than its nearest rival — the Commodore 64.'

But there seems to be little likelihood of other manufacturers increasing prices in step with Oric. A Commodore spokesman categorically denied there were plans to increase the price of the 64.

Terry Cartwright of Prism, Oric's distributor, said his company had been surprised by the price rise. Prism was already having difficulty dealing with discounted prices in non-Prism outlets, and an extra £20 is not liable to help.

Oric itself claimed record sales of £2.5 million for June (70 per cent of this for export, mainly to France). Stock levels are said to be 'unusually low' at present, but the company says it is currently gearing up for another record pre-Christmas rush. 'In only a matter of weeks.'

The company is reluctant to say exactly how many machines are currently being sold, and Allan

Castle wouldn't say anything about Oric's financial results for 1983-84. Oric was taken over by Edenspring Investments last autumn in a deal that involved paying off Oric debts totalling £1.01 million and raising £750,000 cash by issuing 25 million new Edenspring shares.

As Oric is now part of a public company, Mr Castle says information on performance cannot be issued before the shareholders are informed, and the annual report is not due until October. He did however deny rumours that Oric intended to close its in-house marketing operation and transfer all UK marketing to Prism. Terry Cartwright confirmed this.

Oric's position, Mr Castle felt, was stable, and he was confident the company would trade on quite comfortably over the rest of the summer.

BBC Micro: whither goest thou?



Just where does Acorn stand now it has secured a renewal of the BBC contract and negotiated to buy Torch Computers?

In an extensive interview, Chris Curry, Acorn's managing director, has revealed to PCN the company's future plans.

In next week's issue Mr Curry discusses

- the business machine — what it is and how much it will cost.
- the Torch deal — what it is and how it fits into Acorn's strategy.
- the BBC B — is there a model C in the wings?

Five go mad on Torch contest

PCN's Torch ZEP 100 competition proved a heavy challenge to our readers. Many replies had at least one wrong answer.

Of those who got it right, the lucky five to be pulled out of the hat were: C Sheppard from Thames in Oxfordshire; David Carroll from Burwash, East Sussex; H Lewis from Hull; Keith Beddard from Edgware, Middlesex; and Peter Stone from Lewes, East Sussex.

Your Z80 second processors will be winning their way to you post-haste.

The correct answers were: 4Mhz; 64K; March 1982; and Control Program Nucleus.

Apple goes for UK copycats

Yet again, Apple Computer, is taking legal action against distributors and manufacturers of so called 'Apple-compatible' computers.

Apple claims that both the Untron 2200 and the Base 64A infringe its copyright in some of its operating programs and manuals.

The Base 64 has a similar case to the Apple machines and Apple also claims that this is an infringement of its copyright case design.

Apple is asking for both companies to end production of these machines and give to Apple any stock so that it can be destroyed.

It is interesting to note that Sirtel (UK), the exclusive distributors of the MPF 11 Microcomputer, another company that Apple had words with regarding 'Apple compatibility', has gone into liquidation. The stock of MPF 11 computer is being sold as scrap and Apple has requested that they be delivered to them for destruction.



COSTLY CASSETTE — Have you ever wanted a low-cost intelligent cassette terminal? Crisite Electronics (045 36 79821) has produced what it claims to be the first cassette terminal capable of storing 1.6Mb of data. The CS7 will operate in both automatic and software controlled mode. The cassette drive connects to your computer via a standard RS232 port and will transfer data at 2000 characters per second. And price of this 'low-cost cassette terminal'? Just £1,595.

Acorn offer boomerangs

Customers and dealers are complaining that Acorn's promotional offer on the BBC micro (issue 68) does not extend to machines fitted with disk or Econet interfaces.

Under the terms of the special offer, buyers of a BBC model B get a free data recorder and five free programs, total value £80.

But would-be customers have found that if they buy a model B fitted with a disk interface they don't get the recorder or free

programs.

One dealer we spoke to complained he has lost sales as a result and is now thinking of complaining to the Advertising Standards Authority as he considers Acorn's advertising of the offer to be misleading.

A spokesman for Acorn confirmed the offer does not include disk machines. 'The offer does not extend to anything other than the standard machine which sells slowly

at this time of the year,' he said.

Acorn didn't extend the offer to disk models because it was bought mainly by business users and the promotion was aimed at home users. 'Anyway, users with a disk system wouldn't want the cassette drive and tapes,' he added.

Although this is clearly not the case, it appears the only way would-be disk users can take advantage of the offer is to buy the standard model Beeb, return to the

shop a couple of days later and get the disk interface added as a retrofit.

It would be more expensive than buying a machine with a disk interface already fitted, but you at least get the benefit of the £80 promotion.

If you want to take advantage of the offer you will have to hurry down to your nearest Acorn dealer as it expires on Tuesday next week (July 31).

Atari all change

Questions about the future of Atari's video games machines and home computers have been prompted by the takeover of the company by Commodore-founder Jack Tramiel. Sweeping changes have seen the existing management ousted and Tramiel loyalists from Commodore days brought in.

The scythe has also swept through Atari UK. Graham Clark, the managing director, and other senior staff are going, and a new

management team was due to take over on Monday this week.

PCN was unable to obtain confirmation last week of the new figures' identity, but industry speculation suggested the new managing director would be John Baxter.

Mr Baxter was UK general manager of Commodore but left the company four weeks ago (issue 68).

The extent of the defections from Commodore to Atari has prompted Commodore to take legal action in

the US against four former engineers now with Atari. Commodore claims they stole important design secrets shortly before they left.

Much of the allegedly stolen information related to a Z8000-based business computer due to be launched next year.

There is speculation that Atari may come up with a micro to rival the Apple Macintosh while under-cutting it in terms of price.

Rotronics drives a bargain for Sinclairs and 64's

Micro tape drives seem to be taking over with gusto. First came the Spectrum Microdrive, then the QL, and now the Wafadrive from Rotronics.

The unit comprises two high-speed tape drives, a Centronics parallel port and an RS232 serial communications port. Also supplied with the system are two tape cartridges, one blank and one containing a free word processor program.

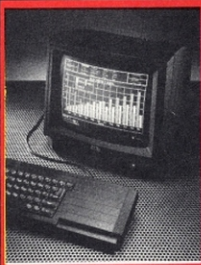
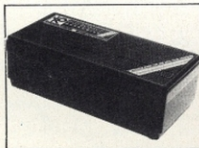
It will be available in August for the Spectrum for £129.95, and later on in the year for the Commodore 64 at £159.95. Rotronics hopes to supply the Wafadrive for a number of other machines next year.

The 'wafas' are made up in a similar format to the famous Microdrive cartridges, consisting of an endless loop of tape with a storage

capacity of 16K, 64K, or 128K. The prices of the wafers will be £3.45, £3.65, and £3.95 respectively. The shorter tapes obviously give faster access time — around 6.5 seconds worst case.

The Spectrum version offers a set of extended commands giving full implementation to all the standard filing commands.

The Commodore version will be compatible with the Vic 20, the 64 and the 16.



QL GETS CUB — Queen's Award winner Microvitec (0274-390011) is following up its success with the Cub monitor for the BBC micro with a version customised to work with the QL. Blessed with the tongue-twisting name 1451/DQ/3, it is an RGB/TTL-input monitor offering a resolution of 653 by 585 pixels and comes in a case colour matched to the QL's. It costs £275 including VAT.

Pitfalls and pirates

Legal action is becoming a way of life for software house Microdeal.

Last week it led a group of ten software houses against an alleged software piracy operation. A few days prior to that it gave undertakings to the High Court not to sell any more copies of *Cuthbert in the Jungle*.

The undertakings were given after Activision went to the court claiming *Cuthbert* was a copy of its best selling *Pitfall*.

Microdeal's anti-piracy action is being taken against a doctor and his 14 year old brother who, Microdeal alleges, ran a commercial tape-copying operation from several addresses in Lancashire.

They were selling, through classified adverts in micro magazines, a tape of 35 games as well as utilities, copier programs and a word processor.

Microdeal obtained from the court an Anton Pillar order that allowed it to enter and search the doctor's house. In a subsequent

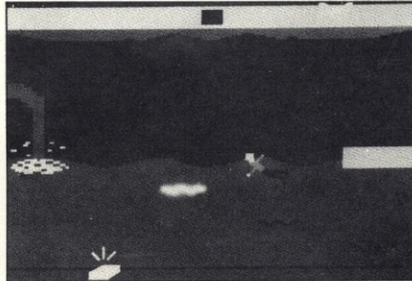
raid, a number of tapes and duplicating equipment were seized.

The case was due to appear in the High Court as PCN went to press.

■ Activision has now released a sequel to *Pitfall*. Uninspiringly called *Pitfall II: Lost Caverns*, it will

be available on the Commodore 64 as well as the usual Atari/Colecovision list of machines. Described by Activision as a 'power-house adventure', the plot has Pitfall Harry lost in a cavern and searching for his cat, his niece and jewels.

Part of the action from *Pitfall II*



IN BRIEF

Visi prices slashed

Rapid Terminals, the company that distributes VisiCorp products in the UK, has slashed prices of the VisiSeries of software packages.

VisiCalc 1.2 for the IBM PC has tumbled from £295 to £96. VisiSchedule is down from £245 to £170. VisiFile drops from £212 to £125. VisiWord Plus goes from £285 to £175. And VisiTrend/Plot plummets from £245 to £85.

Prices for Apple versions of the same programs have also been cut. New prices are the same as IBM versions except VisiSchedule and VisiFile which are £125 and £110 respectively.

Sig/Net User Group

An official user group for Sig/Net users has been set up under the chairmanship of Keith Forward, Assistant Principal of Huddersfield Technical College.

The user group has the backing of Data Dynamics which acquired the manufacturing and marketing rights to Sig/Net products in January.

Further details of the group can be obtained by writing to Mr Forward at Huddersfield Technical College, New North Road, Huddersfield, West Yorkshire, HD1 5NN.

Thorn raises cash

Thorn EMI is having to raise extra cash following the announcement that it is buying Immos, the state-owned semiconductor manufacturer.

The company is buying a 76 per cent stake in Immos for £95 million. It aims to raise £136 million by way of a rights issue of new shares.

Micros go east

British micro makers should find it easier to sell their products to East European countries.

Regulations agreed by NATO countries and Japan have prevented the export of micros and other computer equipment to the Eastern Bloc.

Even exports of micros such as the ZX81 have been banned because American military experts claimed it could be used for targeting missiles.

Now the regulations have been relaxed and eight-bit micros have been exempted from the regulations. The ban on 16 bit micros remains in force.

Agency for programmers

A new company called MicroNation has been set up to help software authors steer their way through the maze of software publishing.

It will act as agent for the authors, finding the best outlets for their products. The company will also provide advice and assistance in developing program ideas into marketable products.

MicroNation is on 0792-476203.

VIEW FROM JAPAN



The oriental wet theory of computing

By Serge Powell

Call me Isaac Newton. Call me Archimedes. I think I have figured out the reason personal computing is growing so popular in Japan and perhaps why Britain has the highest percentage of users in the world. It is caused by rain.

Here we are in the middle of the rainy season. How better to escape its monotonous tedium than exploring mysterious caves and islands or evading hordes of maudering extra terrestrial invaders.

Actually there is probably little correlation in Japan between the number of computers sold and the extent to which they are used. Without wishing to bore you with statistics, a recent survey by the Ministry of Education reveals the following:

Fifty six per cent of Japanese high schools are equipped with computers. On average, each school has 4.2 units. However, in spite of their availability 72.7 per cent of the teachers never use them in class, 10 per cent use them a few times a year, 6.5 per cent use them once or twice a month, 3.6 per cent once per week, and 7.2 per cent at least twice a week.

Teachers most frequently use them to teach science or technical drawing. Those not using them teach Japanese, home economics, fisheries and arts.

On the bright side, 84.8 per cent did hope that suitable software would be developed making computers more appropriate for school use.

In the meantime, Japanese manufacturers have no intention of cutting back on production. As from time to time suggested in this column, the Japanese invasion of the European computer market is about to begin.

A fortnight ago Toshiba and Sanyo formally announced plans to start exporting MSX micros in September. Initial shipments have been set by Sanyo at 5,000 for France, 10,000 for Britain. Toshiba has set an initial annual target for Britain of 100,000.

Although the potential for these 'open ended compatibles' was initially uncertain, they have recently been proclaimed to be a success with 200,000 units sold in eight months. Total shipments are expected to reach 500,000 by next March.

To update an earlier column, 12 manufacturers now offer a total of 26 machines, and software is proliferating at a rather rapid pace.

By way of an aside, during a recent visit to a major computer manufacturer I noticed a large swing in the percentage of software on disk rather than cassette, indicative of some system upgrading.

(Even further aside, Hitachi and Fujitsu have announced the development of the 4 megabit bubble memory which is having an interesting ripple effect.)

But getting back to upper case Basic of the MSX variety, if the hardware invasion is nearly as successful as its perpetrators expect this should create an opportunity for imaginative British programs since Japanese software is as yet notoriously poor.

Note that the Japanese micro makers had to go to the US's Microsoft for MSX rather than a local supplier.

Anyone producing games of a high quality should find a ready market for them here providing any linguistic problems can be overcome. Not a particularly intimidating challenge.

Britain should get a useful headstart on MSX. The intention is to use Europe as a test market for MSX and sales into the United States won't start until next year.

Successful British programs will therefore not only find a ready market in Japan but also in the USA when the Japanese start selling big there.

And big is how they will sell. While the MSX standard may be based on outdated hardware, you cannot escape from that traditional Japanese skill — marketing. After motorbikes, hi-fi, television and video it is now home computers.

Look out World, the Japanese are coming.

No-go Graduate

By Kenn Garroch

The most notable attraction of the Electron & BBC User Show at Alexandra Palace failed to appear.

The Graduate, the add-on for the BBC Micro which will, reputedly, run IBM software (Issue 66), was to have made its debut at the show.

Unfortunately, instead of a Graduate, there was a note on the Torch stand to the effect that it was having problems running Lotus 123. Bob Gilkes, Torch's managing director, said that until this was solved, it would not be shown to the press or public.

Torch is expecting Data Technologies to have fixed all the problems by the last week in August and it may make its first appearance then.

Among the few attractions at the show was the Golden Jewelled Hare of Masquerade fame, now the prize in a game by Haresoft. The two stage program consists of a graphics and text adventure which, when you solve it, gives the location where the hare could be found, metaphorically speaking.

Since the original masquerade and the Egg Hunt, there have been objections about people digging up the countryside. Haresoft has solved this by keeping the hare. You only need to send the location.

Another product that made its debut was the Pace Electron disk drive, known as Le Box. It comes with the new Amcom DFS and includes a set of sockets to allow the Electron to take 8K sideways



Cat and hare — security for the jewelled prize in the form of Jimbo the securicat.

ROMs. Le Box has a single 5.25in floppy disk giving 100K of storage and will cost £343.85 including VAT.

The rest of the show was taken up by the usual add-ons and software. There does seem to be a rise in the number of control applications available for the BBC and there were several robot arms and turtles moving about the place.

There is also a definite rise in interest in the Electron, with sideways ROM and joystick adapters coming out.

Otherwise it was a fairly quiet affair. There may be more excitement at the official Acorn User show in August.



HUSKY BAR — The rugged Husky handheld portable is proving to be remarkably adaptable. Latest additions to its peripheral range are a bar code reader and printer. Software comes on ROM allowing it to converse in the popular UPC/EAN grocery code with input via an optical wand or the keyboard. The 8610 thermal bar-code printer prints out the bar-codes on to self-adhesive labels. Just the ticket for shopkeepers.

Practically price cutting

By late September you may be able to pop into your local WH Smith or Boots for your PC or Apricot software.

Practicpro, publishers for the popular 'Practi' series of programs for the Commodore 64, is to release three 'integrated' packages for under £100 each. The programs include a wordprocessor, database and spreadsheet.

They're not truly integrated in that they can be bought and used individually, but a common data file format means you can easily incorporate data from one in another, even if there's some disk-swapping to do.

Practicpro is very similar to Wordstar, down to many of the control sequences used, but offers a number of unusual and useful features such as abbreviation files, glossary and index selection and ordering an in-program printer selection.

Practicbase provides menu-driven database features and can use dBase II files. Practicall III is the spreadsheet and includes simple word processing.

At £99.95 each, or £249.95 for the three, Practicpro is challenging established sources, and the pricing strategy should help push software prices down even further.

Turtle turns a corner

Britain's first remote-controlled floor turtle was wheeled out in the House of Commons last week.

Aimed mainly at the educational market and costing £228.85, the Valiant does actually resemble a turtle and should have a great appeal to young children.

Commands are sent from a computer via an infra-red link, removing the need for trailing wires. The turtle can roam around the floor as little as one metre from the micro and as much as six metres away.

The Valiant's shell is a transparent geodesic design that allows the insides to be seen in operation.

With the turtle comes a set of rechargeable batteries plus charger, turtle graphics software, BBC micro, the infra-red controller board, a pen and a set of manuals. The batteries should last about three hours with continuous operation

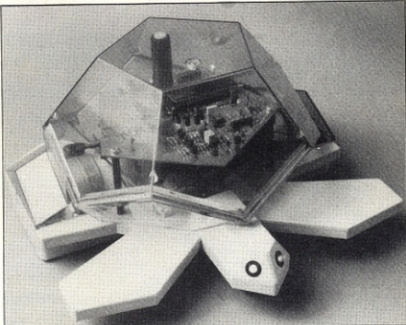
and about eight with intermittent use.

The turtle's eyes are the battery status LEDs and will go out when the batteries are about to run down. They can be fully charged overnight or so if it is accidentally left on.

The Valiant can be controlled by a range of computers including Apple, BBC, Commodore, DEC Rainbow, IBM, Spectrum and the RML 380 and 480Z. The software is available for all of them.

Priced at £228.85 including VAT, Valiant is offering a £50 discount for schools. It will be available through EJ Arnold, the educational suppliers, and should be in high street shops by the autumn.

It is currently available through mail order from Valiant Designs, Park House, 140 Battersea Park Road, London SW11 4NB, telephone 01-720 3947.



Valiant wire-less wanderer comes with £50 discount for schools

Granada TV switches on to selling popular micros

You can now buy your micro from the same place that you hire your TV.

Granada TV Rental, one of the country's largest TV rental companies, is going into the micro business, selling leading micros, software and peripherals through a selected number of its retail shops.

About 40 shops are already selling Spectrums, Electrons, BBC Bs, Commodore 64s and Vic20s. The company hopes the number of shops will expand to over 100 within the next few months.

But Granada says it does not intend, for the time being, to start renting micros. 'Should there be a demand for rental we are ideally situated and we are keeping our options open,' said a spokesman.

Granada's push into selling micros follows a pilot project involving a small number of stores dotted around the country. 'Home computers, like TVs and videos are screen-based products and are therefore a natural extension to the audio-visual products we are already offering.'



If you can't buy one, build one. NMW (0270-626023) provides financial information to stockbrokers and couldn't find a micro with the communications features it needed. So it went out and designed its own. Called the Series 2000, it is based on Intel's 80186 super chip and comes with Concurrent CP/M. A network controller adds a 2400 baud modem and a local area network capable of supporting satellites, each serving three VDU's. Prices start at £1,975 (plus VAT).

SOFTWARE

The new releases



Robo — Apple go-faster graphics.

Games

Spectrum: If outdoor games are your kind of challenge, Buffer Micro Shop (01-769 2887) has brought out Athlete for running, jumping and throwing fans.

Commodore 64: Supersoft (01-861 1166) is launching itself into outer space with a space flight simulator called Interdictor

Pilot. It was written by a serving RAF officer and sells for an out-of-world price of £17.95. Talent Computer Systems (041-5522128) has launched a batch of programs for sale by mail order. Panorama is a graphics program that Talent uses itself for all its 64 games; Archipelago is an underwater maze-running game; West is a 'real-time' adventure set in a wild ghost town. Kalah is a game of strategy as played by bedouins using pebbles and holes in the sand.

BBC/Electron: Talent's West is also available for the Beeb and Electron, for which the company has written Laser Reflex, and alien zapping game where the action is all done with mirrors.

Utilities

Commodore Pet: You can now throw away your keyboard and

replace it with a Microwriter. Microcomputer Services (01-831 6801) has developed Speakeasy, a communications package that includes all the cabling and interfaces in its £140 price.

Apple: Robocom (01-881 2334) has developed Robo 1500 as its top-of-the-line drawing software which it claims is the 'fastest, easiest and most advanced' of the three packages it produces. As usual you get a Robocom Bitstick controller included in the price. For electronic engineers, Circuit Analysis 2.0 does linear analysis of both AC and DC characteristics of a circuit and includes worst case limit calculations. It is available through P & P Distributors at £59.95.

Business

IBM: Sonata Payroll is the first payroll package for the PC that

lets companies take advantage of the Banks Automated Clearing System (BACS). With it you can access your bank's computer directly and save yourself the three day delay of the normal clearing procedure. Further details can be obtained from RSB Systems on 01-541 1444. Microsoft Project at £199 is aimed at the user who wants an easy way out of planning complex projects and schedules. Microsoft is on 07535-59951.

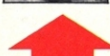
Newbrain: Kuma (07357-4335) has applied its communications skills to the Newbrain and produced Prestel Communications for £39.50 (plus VAT). In addition to Prestel you can also use it to dial up Telecom Gold.

MS-DOS: Anagram Systems (0403 59551) has rewritten its Integrated Accounting Suite to run under MS-DOS.

PCN CHARTS

GAMES

NEW WEEKLY CHART! NEW WEEKLY CHART



	GAME TITLE	PUBLISHER	MACHINE	PRICE
▲	1 2 Sabre Wolf	Ultimate	SP	£9.95
▼	2 1 TLL	Vortex	SP	£5.95
▲	3 7 Match Point	Psion	SP	£7.95
▲	4 6 Lords of Midnight	Beyond	SP	£9.95
▲	5 8 Valhalla 64	Legend	SP, C64	£14.95
▲	6 26 Fighter Pilot	Digital	SP	£7.95
▲	7 4 Beach-head	US Gold	C64	£9.95
▲	8 12 War of the Worlds	CRL	SP	£5.95
▼	9 3 Mugsy	Melbourne	SP	£6.95
▼	10 5 Arabian Nights	Interceptor	C64	£7.00
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▼	12 9 Hulk	Adventure International	SP, C64, AC, AT	£9.95
▲	13 15 Jack & B'Stark	Thor	SP	£5.95
▲	14 22 Jet Set Willy	Soft Projects	SP	£5.95
▼	15 11 Beaky & Egg Snatchers	Fantasy	SP	£6.50
▲	16 — Cavelon	Ocean	SP, C64	£5.90
▲	17 14 Loco	Alligata	C64	£7.95
▲	18 25 Encounter	Novagen	C64, Atari	£8.95
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▲	20 13 Frak!	Aardvark	Acorn	£7.50
▲	21 28 Kosmic Kanga	Micromania	SP	£5.95
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▲	26 23 Night Gunner	Digital	SP	£7.95
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▲	28 — World Cup	Artic	SP	£6.95
▼	29 19 House of Usher	Anirog	C64	£6.95
▼	30 16 Trashman	New Generation	SP, C64	£5.95

MICROS

Top Ten over £1,000

TW	LW	MACHINE	PRICE	DISTRIBUTOR
►	1	IBMP	£2,390	IBM
▲	5	Apricot	£1,760	ACT
▼	3	Apple III	£2,755	Apple
▼	4	Sirius	£2,525	ACT
▲	6	Televideo TS1603	£2,640	TH
▼	4	DEC Rainbow	£2,359	DEC
▲	7	Compaq	£1,960	Compaq
►	8	Wang Professional	£3,076	Wang
►	9	Philips P2000 c	£1,484	MD, KDS
▲	10	LSI Octopus	£1,760	LSI

Top Ten up to £1,000

TW	LW	MACHINE	PRICE	DISTRIBUTOR
►	1	Spectrum	£99	Sinclair
►	2	CBM 64	£199	CBM
▲	3	Electron	£199	Acorn
▼	4	Vic 20	£145	CBM
▲	6	BBC B	£399	Acorn
▼	5	Oric Atmos	£175	Oric
►	7	Memotech 500	£275	MTX
▲	8	Atari 800XL	£250	Atari
▲	9	Oric	£99	Oric
▼	10	Dragon	£150	Dragon

These charts are compiled from both independent and multiple sources across the nation. They reflect what's happening in high streets during the week up to July 19. The games chart is updated every week.

Neither mail order nor deposit-only orders are included in these listings. The prices quoted are for the no-frills models and include VAT.

Information for the top-selling micros is culled from retailers and dealers throughout the country and is updated every month.

PCN Charts are compiled exclusively for us by RAM/C, who can be contacted on 01-892 6596.


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SAFE-CRACKER Catch the robbers who have broken into the bank vaults without getting cllobbered.	PARA-SHOOT Your gun tower is under attack from parachutists. Either shoot the planes before they drop the troops or kill the commandos as they descend.	CHANNEL TUNNEL Race the computer guided French to complete your tunnel in the most economic way. Avoid digging through solid rock as this slows you down.	HEADACHE Try to escape from this labyrinth of corridors whilst being chased by a maniac with a lawn-mower.
LAZER BLAZER You must destroy all the invaders before your time runs out - but you must kill them in the right order to score maximum points.	OFFER ONLY AVAILABLE FOR: 		SUPER-MOUSE A cat and mouse game where you are the cat searching for the real mouse. But watch out for SUPER-MOUSE because he kills pussies like you!
FISHERMAN FRED For the younger games player. Try to help Fred catch some fish for his tea. Six sell levels.	THREE CARD BRAG The traditional card game but you must play the computer. You may bluff if you wish but so will he and he's pretty good at it!	GOLD MINER Find the real gold hidden in the mine-maze whilst being chased by the miner. Don't get wall'd in.	DOMINATION A game of battle and conquest for two players. Each side takes turns to attack, defend or retreat. Based on strategy - not luck.
INCA GOLD Fend off the horde of bandits who are attempting to rob the tomb. You can move the gold or kill the bandits with your sword.	TYPE TRAINER Learn your way about the standard QWERTY typewriter keyboard. Tests at 4 skill levels and gives scores in words per minute. Really useful.	COMPUT-A-SLOT An all-action simulation of a slot machine complete with HOLD and even a handle to pull. Scores for 2 or 3 of a kind plus mystery pay-outs.	CONVEYOR Fast fingers and quick wits needed to sort the items on the conveyor belt into the correct places before the scrap bin overflows.

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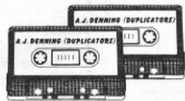
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Why can't Amstrad be more like Tandy?

Of course the Advance 86 should be supported (issue 66). It sounds a very good machine, but like a number of others on, or about to come onto, the market we shall not know its full potential until we operate it and, principally, experience the Basic, the graphics and the colour.

Since it seems any machine stands or falls first on the quality of its language I was somewhat perturbed that the Advance 86, like the Sanyo MBC555, and certain other machines is using a very pernickety Microsoft Basic. 'Pernickety' because of its insistence on the inclusion, in a Basic program, of numerous spaces run. I don't know how this idea arose, but I sincerely hope it sinks back into the primordial slime from which it emerged.

The prospect of this space insertion around every keyword, loop parameter *et al*, fills me with pure pique being, as it is, wasteful of memory, awkward in programming and infuriatingly unbalanced in reading. Let's return to the pure, simple sense of the Basic possessed by the Tandy TRS-80 Model I — a classic of simplicity and easier to use than any other language I've encountered. It had its drawbacks, of course, but it would have been far better to have extended and developed a fundamentally *good* language, than to have created the space-strewn monstrosities now appearing.

It is quite conceivable that a memory overhead for line numbers and forced spaces could make up ten per cent of a program. Line numbers are useful and necessary; forced spaces should be regarded as an abomination. Before the readability-enthusiasts reach for their swords let me assure them I have no wish to deprive them of neat

PCN £10 Star Letter

layouts. It is merely being *forced* to use them that raises my ire. If a machine declares that I have 44K available, I don't wish to waste up to 4K of it in useless spaces.

Memory available to the programmer is the second criterion by which machines will stand or fall. When a 128K machine has the gall to offer me a measly 40-odd K as workspace after loading the language and having the DOS eating into the declared memory, I bristle. If Tandy could pack a brilliant Basic into 16K of ROM seven years ago, why do we find ourselves losing around 85K of RAM to an inferior one now? I do not call this progress.



Would you like to see your name in print? Here is your chance on *PCN's* letters page.

By the same token, if Amstrad can give us 43K out of 64K to use, *and* 27 colours I can excuse to some extent another Basic requiring spaces. These people have tried to give the best value they could.

Any computer claiming to be a 128K machine, and then offering as little as 41K in Basic is merely pretentious. As far as the programmer is concerned it is a 41K machine and should declare itself as such.

The third way in which a machine will be judged is colour and graphics. A resolution of 640×256 pixels or thereabouts seems to be what can be provided within the current limitations of memory, and is very acceptable — indeed the 320×256 BBC Mode 1 is quite good. It needs to be somewhat better. But, as far as colour is concerned, the performance of most current machines is extremely poor and very limited.

Perhaps someone should be thinking of a 256K machine with 150K of program memory, a good non-wasteful, non-spacey Basic, high-resolution graphics and the ability to use from a range of 256 colours and shades.

Add easily-assigned user-defined characters and sprites to this formula and there is a world-beating machine in there somewhere.

P Craddock,
Walsall WS1 2AZ.

Commodore slurs are out of order

I feel I must put pen to paper in response to some anti-Commodore propaganda in issue 65.

The first was contained within the interview with Sir Clive Sinclair. Despite what he says, he was trying to shift his delay problems onto other manufacturers such as Commodore and IBM. As far as I can make out, no computers were announced by Commodore last June.

In about October, it did announce several new machines but they would not be available until autumn this year. The company also said several of the machines may only be available in the USA. Even if Commodore had announced new computers a bit early, it at least didn't get customers to fork out for them four months in advance.

Also, in the recent Commodore User Show article, you say the new machines don't run 64 and Vic software, but all the peripherals work. I doubt if the QL can run any Spectrum peripherals. One up for CBM, I believe.

The second thing in this issue that got up my nose was the last few paragraphs of the Commodore show report. You stated that Chuck Peddle had left Commodore and developed the Sirius, one of the world's most popular business computers. You failed to point out that CBM then launched the world-beating Vic 20 and then followed it up with the Commodore 64. Now that Jack Tramiel has left to set up a new company, Commodore has announced the C16 and Plus/4: a case of history repeating itself?

Just keep off CBM's backs. I don't work for Commodore but I am what you might call a loyal fan. It arguably produces the finest computers in the micro market and sales figures far exceeding the competition testify to this.

Simon Mills,
London SW12

Dragon micro still has teeth

As it seems improbable that Pete Woods will resurrect the former 'Dragon Dungeon' business, would any readers who may have been subscribers to the Dungeon's Dragons Teeth magazine be interested in an attempt to reform as a (strictly non-commercial) user group.

I doubt we would be able to

attempt anything as comprehensive or elaborate as the original, but I think it could serve a useful purpose, if only on a help and information exchange basis.

The old 32 survives as a good general purpose machine, (as anyone who ever used rather than reviewed one can confirm), and the 64 is just as good. As usual, no-one wants to know . . . they're all too busy poking Commodores or waiting for Sinclairs, so it's up to us.

If anyone is interested in getting something started, I'll be pleased to hear from them . . . *all* ideas, help, and suggestions welcome.

Paul Grade,
6 Navarino Road,
Worthing, Sussex

Newbrain groups are not so rare

I would like to draw the attention of D Day (issue 68) and other Newbrain users, to the fact that an active Newbrain Users Group does exist for precisely those reasons D Day outlines.

The bi-monthly magazine from the group NBug includes programs, hints, tips, *etc.*, members' articles for sale and more of interest to Newbrain owners.

The address of the group is: Newbrain User Group, 36 Armitage Way, Cambridge CB4 2UE.

J Pitcher,
High Wycombe, Berks

WH Smith offers an excellent service

I congratulate WH Smith. Many people say how shocked they are to have to wait weeks or months for their computer while it is being repaired.

When my Spectrum failed I was disheartened for I thought I would be another one of the many people waiting for their computer to return. But when I took mine in the people were very nice but I had lost my receipt and my hopes dropped.

The assistant listened to what I had to say and then disappeared saying he would not be long. He came back soon and to my amazement had a new Spectrum and he swapped them and put my old one away. He said sorry for the inconvenience.

I hope the management praises the good work done by their very nice and understanding workers.

Paul,
Coventry, W Midlands

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Commodore DATA— graphical or musical

Q I know what the DATA statements are used for in music on my Commodore 64 but I don't understand how they are used and what they mean in graphics.

Adam Knights,
Lowestoft, Suffolk

A You seem to be confusing the specific and the general here. DATA statements are simply lists of information that the 64 can use in a program. They can contain either numbers or text and graphics.

In music the DATA is a list of the values to produce different notes, possibly including the length of time a note is to be played, which voice is to play it, filter settings and so on.

There are a number of possible uses for DATA statements in graphics. Usually you'll find them associated with sprites or user-defined characters. If you look closely at your TV screen (don't overdo it) you should be able to see that all characters are made up of separate dots. On the 64, characters are made of eight dots across and eight dots down. Sprites have 24 dots across and 21 dots down.

Eight dots are chosen because that is the size of each memory location in the 64 (and every other 8-bit computer). Because each dot can be on or off this gives a possible range of values between 0 and 255—two to the power of eight. This is also why you cannot POKE a number greater than 255 into a memory location.

If you think of each character as being a row of eight bytes of memory, you can define a character by eight numbers between 0 and 255. The Commodore 64 allows you to create your own characters in this way. Sprites can be thought of as 21 rows of three bytes, so you can define a sprite by 63 numbers between 0 and 255.

If you look at the section on sprites in the user's manual that comes free with your 64, you'll find some more information on this. To discover how to do more with sprites, and how to

define your own characters, get a copy of the *Programmers Reference Guide*, also published by Commodore. This contains a wealth of information on these subjects and a great deal more. As you find new areas of interest in programming, you'll find this book essential.

Oric drawing on the HIRIS screen

Q I would like to use machine code for drawing on the Oric HIRIS screen. Could you please print a short sample program to show me how to go about it?

J Morris,
Gateshead, Tyne and Wear

A There is little point writing your own machine code routines for this, as they're all available in the ROM anyway. Basic just passes the variables to these routines and unless you write specific routines to draw specific shapes, the speed advantage will be minimal.

If you really must use machine code, you'll need an assembler to begin with. Then it's simply a question of effectively POKEing data to the screen. The text screen begins at address 48000, so to get the letter A to appear in the first screen cell you'd use a sequence of commands like:

```
LDA 65      ;load accumulator with 65
STA 48000   ;store value in accumulator at address 48000
```

This will store the value 65 in address 48000. Drawing on the HIRIS screen will follow the same principles except that the screen now starts at 40960 and you'll have to be careful with colour codes.

Oric bugs still on the loose

Q I just can't get to grips with the colour codes on my Oric. If I PLOT 1,25, "Score" and then PLOT 7,25,STR\$(SC), the two items don't have the same colour code. The plotted variable always appears in green INK. If I change the INK colour, the variable still doesn't change colour.

The other thing is that if I use TEXT:INPUT AS:HIRIS:PRINT AS all I get are some LORES graphics or some solid blocks, whereas HIRIS:INPUT AS:PRINT AS works

fine.
B Hochstrasser,
Araschgen, Switzerland

A Your first problem is simple and due to a well-known bug in the Oric's ROM. What this does is to add a CHR\$(2) or Control B to the beginning of positive variables converted to strings via STR\$. To get round this you will have to amend your program to something like:

```
100 SC$=STR$(SC)
110 IF LEFT$(SC$,2)=CHR$(2) THEN
    SC$=RIGHT$(SC$,LEN(SC$)-1)
120 PLOT 1,25,"Score":PLOT 7,25,SC$
```

Line 110 will remove any leading CHR\$(2) from SC\$. CHR\$(2) is, of course, the Control code for green INK. Negative numbers are not affected by STR\$ because of the leading negative sign.

We don't understand your second problem, it could be something to do with the way the Oric moves its character set around between HIRIS and TEXT commands, so don't forget to use HIMEM #7FFF as the first line of your program (#17FF for 16K models). If this doesn't cure it there may be something odd about your particular machine, so you'll have to take it to your dealer.

Vic 20 assembly hand crafted

Q I am beginning to learn machine code but I don't have a monitor. I can convert most assembly listings but I don't know how to convert BNE as it only uses two bytes and the number after it exceeds 255 (decimal). I have a Vic 20.

Christopher Mungall,
Newport-on-Tay, Fife

A First may we express our admiration at your persistence in this venture. Hand assembly of this kind is rare in these namby-pamby days of multi-pass symbolic assemblers (why on earth don't you buy one?).

We assume that you're going through the disassembled listing, looking up the hex codes for the op-codes, converting the operands into lo-byte, hi-byte format, then POKEing the values into memory. If that's so, you might encounter problems with BNE and all of the other branch instructions which look,

in disassembled form, like this:
C000 LDA \$FF
C002 CMP \$01
C004 BNE C000

To translate the BNE instruction you cannot convert the address (\$C000) into the usual lo-hi format since the op-code does not work like that. To make life easy for the programmer, even a simple assembler will allow you to enter the destination address and then calculate the branch value for you. The actual number the op-code works on is not the destination address but an offset value—the difference between the address containing the branch instruction and that target address.

Branch instructions are limited to jumps of 127 bytes forward or 128 bytes backward, and this is where it gets complicated. A value of 127 or less will go forward, 128 or higher goes backwards, but it loops—255 will go back one byte, 244 two bytes and so on.

If you persist in this tortuous process of self-teaching you will end up an expert of 6502 machine code, and, no doubt, derive a great deal of satisfaction. You should try and get hold of a series of books called the *Microcomputer Cookbooks* written by a like-minded lunatic called Don Lancaster. They are extremely informative and very entertaining.

Maplin modem lacks approval

Q I recently bought a Maplin 300/300 Modem to use with my Spectrum and RS232 interface. Is it possible to use Micronet 800 with this? If so, where can I get the required software? Kenneth Sutherland,
Drumadroch, Invernesshire.

A As the Maplin modem does not have Telecom approval it is illegal for you to use it for communications over the public telephone system. Because of the Spectrum's 32-column screen display it cannot be used with Prestel (of which Micronet is just one part).

Micros with a screen width of 40 columns or more can be used with Prestel and there is a poorly advertised 300/300 service for users with this kind of modem. Its disadvantage is that it does not provide colour graphics.

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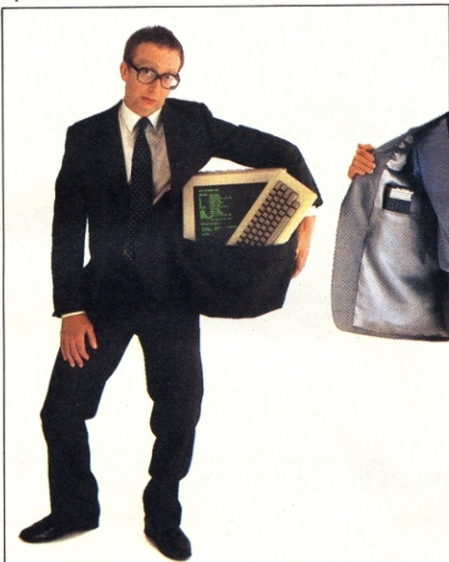
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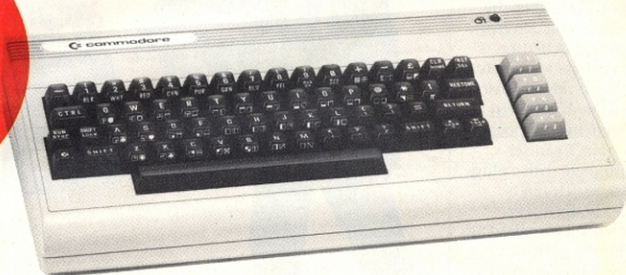
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COMMODORE 64's

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A look at the features reveals why the 64 has become one of the best-selling computers in the world. You get a very powerful graphics machine with 40×25 text display, 320×200 high-resolution, 16 colours and sprites. The sound is simply the best available on any micro with three independently controllable voices, envelope and waveform control, filters, ring modulation, synchronisation and a host of

features normally found only on dedicated synthesisers.

In addition, there's a handy 38K of memory free for Basic programs, and a mammoth 58K free for machine code which is why the 64 features some of the best software available — home and business utilities, music programs, graphics packages and, of course, those great games.

How can you get your hands on one? Simply fill in next week's entry form which will require correct answers to six questions. Here are the first three to get started on. Entries must arrive no later than Friday, August 24. The first all-correct entries out of the hat win the machines.

1 Commodore computers share a common operating system. What is it called?

.....

2 Graphics on the Commodore 64 are handled by a single chip. What is it called?

.....

3 What is the name of the processor that handles sound synthesis on the 64?

.....

When you have answered the questions clip out this coupon and keep it until next week. Issue 72 will contain the remaining three competition questions and the entry form.

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More hints and tips from our readers to make programming a little easier.

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Send your contributions to: *Microwaves, PCN, 62 Oxford Street, London W1A 2HG.*

Open a window to the Oric

The Oric 1 computer does not support any facilities for creating windows on the TEXT or HIRIS screens. By issuing the commands explained below a similar effect to windowing can be achieved.

POKE 623,X where X is the number of lines available from the top of the screen. The lower part of the screen cannot be printed to, but text can be placed on it by POKEing or PLOTing. If X exceeds 27 some interesting effects can be observed when the screen is scrolled.

Electron emulates BBC Mode 7

The following program can be used to allow the Electron to produce Mode 7 type characters (as on the BBC).

Used in Mode 1, the routine works by printing a message on the screen at any point. It uses the point command to sense if a point is to be plotted or not. Before running the procedure, a number of variables have to be assigned.

```

10 MODE 1
20 M% = 4: V% = 1: Y% = 1: C% = 2
30 PROCPRINT("HELLO", 0, 51 2)
40 END
30000DEFPROCPRINT(D$, X%, Y%)
30010X1% = X%: Y2% = Y%: GCOLOR, C%
30020PRINT TAB(0, 30): D$; STRING$(39 - LEN(
D$), " ")
30030FOR A = 32 TO 64 STEP (M% * V%): Y1% = Y
2%
30040FOR B% = 0 TO (LEN(D$) * (M% * 8)) STEP M%
30050 IF POINT(B%, A) = 0 PLOT 69, X1%, Y1%: PL
OT 1, M% * V%: 0: X1% = X1% + M% * V% + 2: ELSE X1% =
X1% + M% * V% + 2
30060NEXT B%
30070X1% = X%: Y2% = Y% + 4
30080NEXT A
30090ENDPROC

```

To reset the screen POKE another value of X or issue the HIRIS and then TEXT commands.

POKE 621,X move the left margin to the right by X number of places.
RG Harrison,
Blackwood, Gwent

Waves of sound on the BBC screen

The following Basic routine is for the BBC Model B computer but should work on the Model A, in mode 4, or the Electron.

The routine plots the wave form which it picks up from the cassette port. To use the program, the remote plug should be removed from the cassette recorder, and if you have jack plugs the ear plug must be inserted half way so that you can listen to the sound source as its wave form is plotted onto the screen. If you have an Electron you may have to change the location & FE09.

```

Jason Holliday
Birmingham
10 MODE 0
20 P = 7: FE10: P = 7: FE11
30 REPEAT
40 MOVE 0, 7: FE09: 4
50 FOR I = 0 TO 127:
DRAW T%, 7: FE09: 4: NEXT
60 CLS
70 UNTIL FALSE
ENDP

```

Dragon disk in a non-stop spin

The Dragon DOS disk system is a fairly fast 5 1/4 in drive. However, it is possible to increase the speed even further by keeping the drive turning.

The following Basic loader program stores two routines in memory. The first located at &H7F50, returns the interrupts

to normal so that the drives switch off. The second routine at &H7F60 disables the interrupts so that the disk is kept spinning. The play command and other interrupt commands will still function.

Andrew Edgson,
East Barnet, Herts

```

10 CLEAR 200, &H7F49
20 FOR A = &H7F50 TO &H7F56
30 READ B$
40 B$ = "&H" + B$
50 POKE A, VAL(B$)
60 NEXT A
70 FOR A = &H7F60 TO &H7F66
80 READ B$
90 B$ = "&H" + B$
100 POKE A, VAL(B$)
110 NEXT A
120 REM DEMO
130 EXEC &H7F60: REM SWITCH
OFF INTERRUPTS
140 DIR
150 PRINT "THE DRIVE WILL
NOT SWITCH OFF"
160 WAIT 5000
170 PRINT "PRESS ANY KEY TO CONTINUE
CONTINUE": EXEC 41194
180 EXEC &H7F50: REM SWITCH
ON INTERRUPTS
190 PRINT "THE DRIVE WILL NOW
SWITCH OFF"
200 WAIT 4000
210 STOP
220 DATA 8E, C7, 00, BF, 01, 0D, 39
230 DATA 8E, 9D, 3D, BF, 01, 0D, 39

```

Have a go at Atmos anagrams

The program below is for the Oric Atmos and will shuffle any string of words, numbers or characters. This can be used for analysing (or creating) anagrams.

If the 'Y' key is pressed while the program is running, one of two things can be made to

happen afterwards:

- Press 'C' and the same characters continue to be shuffled.
- Press 'S' and the variables are all cleared and the program asks you to enter another anagram.

David Blomfield,
Norwich, Norfolk

```

10 CLEAR: RESTORE: CLS: PRINT@4, 4; "Type in anagram"
15 PRINT: INPUT A$
20 V% = LEN(A$): DIM J$(V%), X%(V%)
25 FOR I = 0 TO V%: J$(I) = "" : X%(I) = 0: NEXT I: E$ = ""
29 FOR K = 1 TO V%
30 Y% = INT(RND(1) * V%) + 1
35 FOR I = 1 TO V%
37 IF Y% = X%(I) THEN 30
39 NEXT I
40 X%(K) = Y%
45 J$(K) = MID$(A$, Y%, 1)
50 NEXT K
60 FOR I = 1 TO V%
62 E$ = E$ + J$(I)
64 NEXT I
70 PRINT E$
75 IF KEY$ = "Y" THEN 90 ELSE 25
80 END
90 Z$ = KEY$
95 IF Z$ = "C" THEN 25
100 IF Z$ = "S" THEN 10 ELSE 90

```


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Thames Valley computer owners are hamming it up. Harriet Arnold tuned in.

Life on the radio waves



A handful of Thames Valley, Amateur Computing Club members found a common interest in amateur radio and realised the potential of linking the two hobbies.

Instead of using their modem to get on a telephone line they simply plug it into a radio transmitter or receiver. 'We

use radio because it doesn't involve phone charges, require British Telecom approval or monopolise the family phone', explained club member Bob Redding.

It's not as straightforward as he suggests, though, as you are required to qualify for an amateur radio licence, and

recognised standards must be used. Mr Redding said, however, that the trend is spreading as members realise that modems communication is cheaper and easier for a radio ham.

Text is transmitted using ASCII code at 300 or 1200 baud and Basicode is used for

transmitting programs.

As a result of combining the two hobbies, Mr Redding's weekly bulletin board caters for both the micro club members and local radio buffs.

More information about the club is available from Joe Edwards on Reading (0734) 867855.

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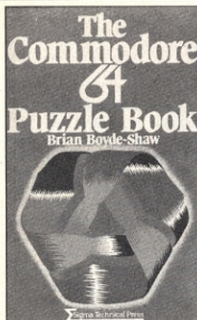
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Help Yaw Ning to find SPOOF the magic dragon, despite the whole world being set against him. Poor Yaw — You'll probably die laughing.

PCN's regular look at the new books — which are worth picking off the bookshelves?



'The Commodore 64 Puzzle Book' by Brian Boyde-Shaw, published by Sigma Technical Press, distributed by John Wiley, at £6.95 (paperback, 130).

Beginner's guides to programming come in a number of guises but rarely are they as cunningly concealed as this one. At face value it appears to be a collection of puzzles reminiscent of those primary school maths tests (if it takes six men to fill a hole . . .). Instead, it's actually a problem book that teaches Basic.

This fascinating idea could have tremendous potential. Unfortunately, that potential is not fully realised in Mr Boyde-Shaw's book. The problem is that it's not ambitious enough. Although the common Basic statements are covered in reasonable detail, any of a hundred books would do as well.

The really interesting bits — sound, sprites, colour, high-resolution — barely rate a mention. In fact, sprite and high-res aren't mentioned at all.

It's to be hoped that a follow-up will be forthcoming because the idea of teaching in this question-and-answer format is attractive. In the meantime, if you happen to be an absolute beginner in possession of a 64 (heaven help you) this book will get you well on the way to Basic programming. But the exciting stuff will have to wait.

PW

'CBM 64 Programs Volume 1' by Richard Franklin and Nick Hampshire, published by Duckworth at £6.95 (paperback, 191).

One of the oldest forms of computer book known to man-

kind — the listings collection. And it's a good one. Nothing startling, it's true, but then the really good stuff is on cassette at your local software shop.

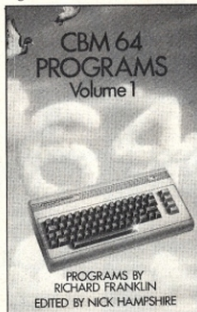
The book kicks off with an epic version of Star Trek on the reasonable grounds that no computer should be without one. There are another half a dozen games — nothing new, but well done.

The real merit of the book comes in the 14 utility and demonstration programs. These cover high-resolution graphics, user-defined characters, machine code, sound, and a personal filing system.

All the listings are large and clear — and dumped to a Commodore printer which means you get proper graphics symbols as opposed to the tortuous non-standard codes used in some other books. All the programs are accompanied by brief documentation and code descriptions.

On the whole it seems a worthwhile buy since even picking and choosing from among the programs will give you a reasonable collection for the price of a games tape. And the Star Trek is well worth having.

PW



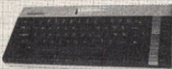
'An introduction to programming the Atari 600/800XL' by R & J W Penfold, published by Bernard Babani at £1.95 (paperback, 116 pages).

Good grief. It's almost impossible to find anything to do with Atari for under two quid so I approached this with some scepticism.

However, this deceptively slim and unglamorous volume is quite a little mine of information, though it must be dug out fairly laboriously — partly because of the frustrating lack of

An Introduction to Programming the ATARI 600/800 XL

R. A. S. J. W. PENFOLD



an index.

Still, mustn't carp too much because the Penfolds have crammed a great deal into the book and even managed to include a few simple games listings and a nifty joystick sketching program in text which is otherwise broken only by a few demonstration routines.

Coming from an electronics-orientated publisher, the amount of technical information is hardly surprising, and for a non-maths person (such as me) its clarity is refreshing. This is best shown in a section on binary and decimal conversion which had previously been a bit of a mystery to me.

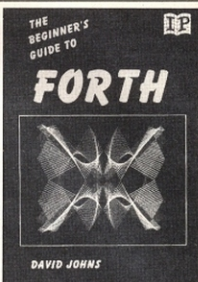
Though the book glosses over many of the more attractive Atari features, it is a gem for a price more usually enjoyed by Spectrum users.

'The Beginner's Guide to Forth' by David Johns, published by Interface Publications at £2.95 (paperback, 85pp).

'Exploring Forth' by Owen Bishop, published by Granada at £6.95 (paperback, 176pp).

An introductory book on Forth should include illustrations showing how the stack can be used and affected by operations. It should have Forth definitions which are clearly explained and which can be used in your own programs. The *Beginner's Guide to Forth* has none of these. It's a slim volume, weighing in at 85 pages, 26 of which are appendices, and these give only watered down and, in some cases, incomprehensible versions of the public domain vocabulary provided by the Forth Interest Group.

There's little mention of word definitions comprising other words and array handling promised in the blurb doesn't



materialise. There's virtually nothing of any use in the book for a novice or anyone else and beginners would do far better to consider spending twice the money for a book with ten times the information and clarity.

One such might be *Exploring Forth*. The text is well-illustrated with flowcharts, tables and the like, making the code fragments easy to follow. The book begins by explaining how Forth differs from languages such as Basic and moves rapidly on to detail the stack, stack operations and so on. Graphics, arrays, control structures, sorting and even such complexities as bit-mapped logic are covered. A full index is included but only one appendix — a pity, since tables of ASCII codes, for example, are always useful.

All the routines are adaptable to your own micro, but some may need some hard work as they're based on Acornsoft Forth for the BBC and Electron. There are some simple games but rather too few routines for the user to incorporate in their own programs.

Most newcomers to Forth should find this a clear and useful introductory text, if not the best ever.

BS



Kevin Hall shows how to protect those spectacular Spectrum programs from unwelcome prying eyes.

Password please

Tape storage on the Spectrum is very reliable, but the method chosen to structure it makes program security difficult. Each block of data or program is preceded by a header, which is a short block of data containing information about the main data, for instance the length, start address and the type of data it is.

Users writing their own software have no way of protecting their programs against unauthorised entry, so I've written a routine which demands entry of a password from the prospective user. The routine prevents the user from continuing with the software until the correct password has been entered.

It has been written with the intention of making its use as versatile as possible. The password can be as long as you wish providing it is at least one character long, and it is easily changed (with the right information) should the need arise. Having said this, once programmed, the routine does a very good job of excluding prying keyboard fingers. Short of totally disassembling the complete routine, the software is impenetrable.

There is also a feature included to customise each different version of the routine for that added bit of security. For reasons of security a disassembly of the machine code has not been included, but an explanation of this customising feature will be given later. The code, which is shown in the program as a decimal dump, is not relocatable. However, to prevent an

absolute address for the code from limiting its usefulness, the Basic loader program requires you first to enter the details of the memory arrangement, and as it dumps the code to memory it adjusts the absolute addresses needed to correspond to the chosen location. This means that each time you set up the routine you must run the whole loader program. If you wish to add the routine to a very long program which takes up most of the memory it may be necessary to place the routine in the printer buffer, which is possible because the code is only 229 bytes long.

The method of password entry and the checking of the validity of the password has been carefully designed. On calling the routine the screen is cleared and the prompt 'ENTER PASSWORD:' is displayed. The correct password should then be typed in.

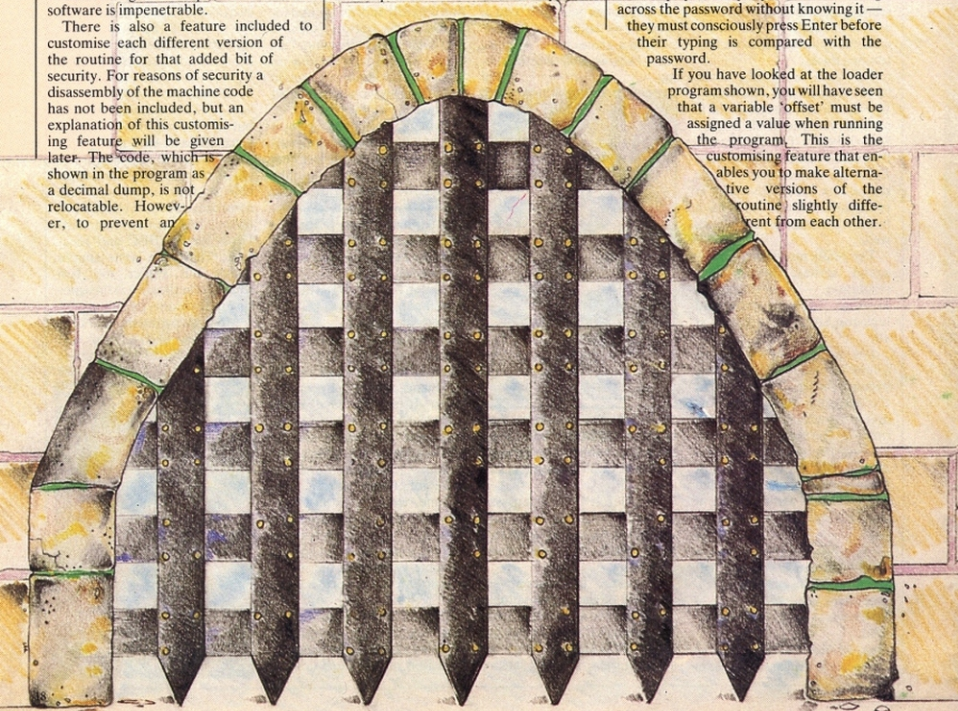
You should take note of the following points: while typing is taking place a beep occurs after every keypress; whatever is being typed is not printed on the screen; no auto-repeat is included for the keyboard;

and after the password has been typed in the Enter key should be pressed.

The password is not printed on the screen while it is being typed in so if anyone is watching they will find it very hard to see what you are typing. No delete feature is provided, so don't choose passwords that are too long, or easy to mistype. It is quite easy to follow mentally where you are, especially with the keyboard beep. No repeat has been added and this prevents you from mistyping the password by keeping your finger on the keys for too long.

Although the need for pressing Enter after the password has been typed in seems unnecessary, and could easily be done away with, it does hold a number of advantages. It enables different length passwords to be used, rather than having a fixed length one which limits the scope a lot, it enables the routine to keep a count of the number of attempts which have been made at typing in the password (the importance of this will be seen later), and it also helps prevent people from stumbling across the password without knowing it—they must consciously press Enter before their typing is compared with the password.

If you have looked at the loader program shown, you will have seen that a variable 'offset' must be assigned a value when running the program. This is the customising feature that enables you to make alternative versions of the routine slightly different from each other.



The variable 'offset' must be given a value between 0 and 128 inclusive. It is not necessary to remember the value you choose for 'offset' each time you use a copy of the routine, but if you choose a different value each time it ensures that each copy of the routine is slightly different from the others, making the routine harder to break into.

When entering the proposed password into the loader program, the following points must be considered. You must remember that upper and lower case characters are differentiated between, and that when the machine code reads the keyboard it will read lower case, unless you hold down caps shift while typing. The routine will accept numbers, and it will also accept any character that you can type with symbol shift depressed except the keywords (NOT, STEP, TO, AND ETC). If you use any keywords in the password, the routine will probably crash, or at best the password will be impossible to type.

You also cannot use any characters that are obtained in 'E' cursor mode, *ie* don't use characters that are printed above or below the keys in green or red respectively, as these are also impossible to type into the machine code. To prevent disasters, you should test any passwords that you think might be suspect before you program the routine into a piece of software. It is better to be sure the password will work rather than be barred from your own software just because the password you have chosen is illegal.

Another feature of this routine which helps exclude pirates is the time delay which has been built into the keyboard input. It is implemented in two different ways: the first may be thought of as sort of time bomb. All the while the routine is running it is counting the time taken between key presses. If this delay ever goes above ten seconds the computer will NEW itself. This feature is designed to stop people testing every possible password by sequentially testing all the possible key orders.

The other timing feature also helps in this respect, although it does not strictly speaking count real time. The routine will count the number of rejected passwords that are entered. You can get the password wrong once, or twice even, but mistype it a third time and the computer will reset itself, clearing out the program.

Adding the routine to machine code programs that you write is no problem. You can call the routine at the start of your machine code with a `CALL` start address instruction and then just proceed with the rest of the software. If the user gets the password wrong, entry to the main machine code program will never be gained.

It is also possible to add the routine to existing machine code programs, with only one condition attached: you must be able to find enough free bytes in memory in order to accommodate the routine, and the password, and the input buffer. If you can find this much space the conversion process is straightforward. All machine

Program listing

```

1 POKE 23609,1
5 INPUT "Where do you want RAMPOT ? " : i%
10 CLEAR rt
20 DIM h(6): DIM i(6)
30 INPUT "Code address (len=227 bytes): " : ja
40 INPUT "Offset value: " : lv
50 LET v% = INT v% : IF v<0 OR v>128 THEN GO TO 40
60 LET offset=v%
70 INPUT "Address of input buffer: " : ib
80 INPUT "Address of password: " : ip
90 LET h(1)= FN h(b): LET i(1)= FN i(b)
100 LET h(2)= FN h(p): LET i(2)= FN i(p)
110 LET h(3)= FN h(a+6): LET i(3)= FN i(a+6)
120 LET h(4)= FN h(a+22): LET i(4)= FN i(a+22)
130 LET h(5)= FN h(a+50): LET i(5)= FN i(a+50)
140 LET h(6)= FN h(a+58): LET i(6)= FN i(a+58)
150 INPUT "Password: " : ip% : IF ip%="" THEN      GO TO 150
160 LET p$=p%+CHR$(13) FOR f$=1 TO LEN p$: POKE f+p-1,offset+
( CODE p$(f)): NE T f
190 CLS: PRINT AT 10,9: FLASH 11:"Dumping code:"
200 DATA 175,50,129,92,24,52,22,11,3,61,61,61,61,61,61,61,61,61
210 DATA 61,61,61,61,61,22,10,3,69,78,84,69,82,32,80,65,83,83
220 DATA 87,79,82,68,58,32,82,69,74,69,67,84,69,68,65,67,67,69
230 DATA 80,84,69,68,58,129,92,60,50,129,92,254,4,52,1,199,58
240 DATA 12,60,32,250,205,107,13,35,144,1,17,144,1,17,144,1
250 DATA 205,181,62,2,205,1,22,17,1(3),h(3),1,3,6,205,60,32
260 DATA 33,0,6,1,1(1),h(1),33,120,92,54,0,35,54,0,62,2,190,32
270 DATA 1,199,58,4,92,60,60,244,177,33,151,1,17,40,0,205,181
280 DATA 3,199,58,8,92,198,offset,2,3,254,13+offset,40,58,4
290 DATA 92,60,40,208,24,248,17,1(1),h(1),33,1(2),h(2),26,190
300 DATA 32,9,62,13+offset,190,40,17,19,35,24,243,17,1(4),h(4)
310 DATA 1,8,0,205,60,32,14,2,14,1,17,1(5),h(5),1,8,0,205,60
320 DATA 32,14,0,6,8,33,83,89,126,246,128,119,35,16,249,6,255
330 DATA 118,62,253,12,13,194,1(6),h(6),205,107,13,201,999
340 RESTORE 200
350 READ z% : IF z% < 999 THEN - POKE a,z% : LET a=a+1: GO TO 350
600 DEF FN h(u)=INT$(u/256)
610 DEF FN i(u)=255-FN h(u)

```

code programs must be called (started) from a short Basic program. This short program can be just two commands:

This will, when auto-run from tape, load the code bytes and call the machine code. The loader may contain other commands (INK, PAPER, PRINT, BEEP etc) which will clear the display and tidy up the subsequent loading, and it may have more than one block of code to load. This will not affect you.

To include the password security routine carry out the following:

1 Modify the Basic loader program at the start of the software as follows: after all the LOAD""CODE commands, insert another two LOAD""CODE instructions.

2 Write down the start address of the RANDOMIZE *USR start address* instruction usually at the very end (this may alternatively be LET *a* = *USR start address*, (or any other variable) OF PRINT *USR start address* etc)

3 Work out where you are placing your 229 bytes of the routine in memory, and place this address in the RANDOMIZE USR instruction in the program, so that the Basic will call the password routine.

4 SAVE the modified Basic loader program over the top of the old one at the very start of the software.

5 LOAD or type in the password routine loader.

6 Convert the address you previously wrote down into HOB/LOB (High/Low order byte) form, as shown on page 173 of

your manual, except don't POKE_n. (or POKE_{n+1}), just print.

7 EDIT the last line of the DATA in the loader program, removing the 201, and inserting in its place: first 195 comma, then the LOB of the address you just calculated, then a comma, then the HOB, then another comma. There should still be the 999 at the end of the DATA line.

8 RUN the program, typing in the same start address you used above, and with your desired password. The machine code bytes (229 of them) will now be present in memory.

9 SAVE these 229 bytes as CODE, and also the password as CODE right at the end of the tape with the software on it, *ie* after the last block of data for the software. You will remember that the loader program was changed so that it will also load the routine bytes, the password, and then run the routine.

When the whole thing is run the Basic loader program loads all the blocks of data, including the routine and the password, and first of all calls the password routine, which passes control on to the main software on receiving a correct password. The routine does not return you to Basic because we have changed the very end of it so that it just goes straight to the main machine program in the memory.

Finally, avoid these passwords as they are too obvious: postcodes, pets names, girl friends and boyfriends, car registrations, second christian names, phone numbers.

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INIT	Initialises new tape
ADVANCE	Winds tape to end
REWIND	Rewinds tape to beginning
HALT	Halts tape between programs
SAVE (filename)	Saves a program to tape
LOAD (filename)	Loads program
SKIP (filename)	Skips to end of specific file
DIR	Displays directory of all files on tape
RUN (filename)	Loads and runs program
BREAK OFF	Disables the BREAK key
BREAK ON	Re-enables the BREAK key
FAST	Speeds up most DRAGONS
OLD	Recovers last program
APPEND (filename)	Adds file to program in memory

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(Delete whichever not applicable)

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Address: _____

Signature _____

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This vast and enterprising escapade impressed seasoned adventurer Mike Gerrard.

Epic proportions

One recent adventure release stands head and shoulders above any others, and that's *The Lords of Midnight* from Beyond Software who, after a shaky start, became a name to reckon with after the release of *Psytron*. Now comes this new epic graphics game which can be played either as a strategy battle or an adventure.

However you play it, there's an intriguing prize to be won by the first to conquer the evil Doomdark who's set to take over the Land of Midnight by decidedly undemocratic means. The winner will have the printout of the scenes from the winning game turned into a novel and share in the royalties, which sounds fine though it does mean laying in rather heavy stocks of Sinclair printer paper just in case your 732nd attempt at playing the game proves successful.

Presentation

Although *Lords* is priced at £9.95, it is handsomely packaged, coming complete with a 32-page glossy booklet that includes the *Midnight* Chronicles. This is not several editions of the local evening paper but five chapters setting the scene for the game. There are also several essential pages of instructions, plus a colour map of the Land of Midnight on the back of the booklet.



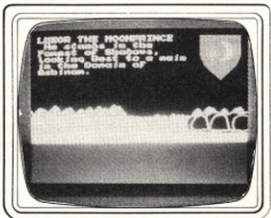
The map is vital for several reasons, not the least being that you can simultaneously control four characters initially, each of these having eight viewpoints corresponding to points of the compass. You can switch from character to character and from viewpoint to viewpoint instantly, which gives some idea of the quite complex and stunning nature of the program. Congratulations are due to author Mike Singleton, whose name may be known to many due to his earlier networking games such as *Starnet*.

The characters involved at the start of the game (you might recruit more as you go) are Luxor the Moonprince, his son Morkin, Rorthorn the Wise and the quaintly named Corleth the Fey. These

four between them must try to prevent Doomdark and his forces from taking over the land. While you can control all four characters yourself, if you wish, obviously up to four people could play together too.

Options

The two ways you can play (although they are linked) are as strategy or adventure. Strategy is an out-and-out war game in which you must recruit armies and move together towards the Plains of Despair, trying to seize the Citadel of Usharak, which is Doomdark's headquarters. The alternative way to try to win is by sending Morkin on a quest to the Tower of Doom in an attempt to destroy the Ice Crown, which is the source of Doomdark's power. If you elect for the second option, don't expect Doomdark to sit round filing his nails of an evening. His armies will still be battling for power over the land, though your own armies of the Free will defend themselves without Morkin's intervention.



If all this sounds very complicated then that's because it is, though Beyond offers a little assistance by way of a keyboard overlay telling you which keys control which commands. The adventure element is not one in the conventional sense where you input your instructions, but more a case of you being given various options at different times and having to choose between them.

The number keys 1-8 control the eight viewpoints for each character, with no less than 32,000 different panoramic views said to be contained in the program. Thankfully you don't have to wait for each of these to be drawn every time, they're up on the screen the instant you press the key, whether it's Morkin looking north west to the Forest of Lothor, or Luxor looking south east to the Plains of Trom many miles away in the opposite corner of the land. It's rather to believe, but the graphics are also rather good, and the perspective changes naturally as you move towards a particular feature.

Another natural element built in is that

you never know what's going to be round the next corner till you actually get there, and when you arrive you can look to check what is at the location. The game switches between graphics and text where necessary, though the location illustrations also have a Gothic-like text printed on them. You can also THINK to remind yourself of various options, and CHOOSE where you have to decide between different courses of events — do you fight the wolves or do you hide?

Trying to assess *The Lords of Midnight* after just a few sessions with it must be like trying to explain the plot of *Lord of the Rings* after reading only one chapter. The game is immensely complex and it will take weeks to even familiarise yourself with the landscape and features, let alone attempt to take on Doomdark's forces. Played as an adventure, it seems impossible for Morkin to reach the Tower of Doom before his strength gives out, and many routes will have to be attempted before starting to discover which might be the best way. The land is so vast that mapping it out fully will be quite an undertaking.

The game is not without its faults, one being that night falls rather too quickly and regularly. When it is night and you must rest, it can be half a minute or so while you sit and stare at the screen's last message before being told it is day again and you can continue. This is repeated every few moves, and is a little irritating.



Another nuisance, though unavoidable, is that you can't simply start a new game as soon as you're defeated. You must either LOAD again, or have used the SAVE command early on (after maybe one move) to allow you to reload using the OLDGAME command.

Overall the program is quite breathtaking, and a few minor complaints hardly matter. Even more breathtaking is the thought that this is merely the first of a trilogy, with *Doomdark's Revenge* and *The Eye of the Moon* still to come. I think I'll go back to simple games like *Ping-Pong* and *Breakout*.

PCN

Vic keyboard close-up

The Vic 20 has confounded its many critics—and some of its supporters—by remaining one of the most popular machines in the home computer market. By today's standards of large memory, advanced sound and graphics and ease of programming, the venerable Vic seems positively out of date. On the other hand it has a real keyboard, better sound than the Spectrum, a huge base of ready-to-run software and lots of expansion possibilities.

Perhaps the severest lack facing the new owner is in the general help which owners of more recent machines may take for granted in magazines and books. So, in this article and in future issues, PCN will attempt to remedy the situation by going back to basics with a guide to the essential bits of your micro, and help in programming sound and graphics.

PRINT statement

One of the most common questions to arrive in PCN's Routine Inquiries mailbox has to do with the control characters that litter so many Vic programs; the colour and cursor controls and other screen formatting characters.

The difficulty with these stems from the complexity of the PRINT statement in Vic Basic. PRINT is almost a language in its own right, having a number of different modes which affect the way certain keypresses will translate into screen characters.

When you switch on your Vic you are in direct mode. There's not much room for error here—any key pressed will result in the character depicted on the keypad appearing on screen. Shifted mode is a little more complicated in that different keys behave in different ways. The alphabet keys (ABC etc) will print the character on the right side of the front of the keypad, while the numeric and punctuation keys will print the character above the one that normally appears.

There is a second shift key bearing the Commodore logo at the extreme bottom left of the keyboard. This is commonly referred to as the symbol shift key and it results in another set of characters appearing. On those keys which have two characters on the front of the key, the left-hand character will appear on screen. On the other alphanumeric keys, the symbol shift acts as a normal shift key.

Control keys

Ignoring the function keys for a moment, there is another set of keys on the Vic. These are the control keys and have words and not characters printed on them. In direct mode pressing these keys will not result in a character appearing on screen. Instead some other effect may occur such as deleting a character, clearing the screen



or moving the cursor; or nothing at all as is the case with the CTRL and Restore keys.

The real complication arises in 'quotes mode' and 'insert mode', essentially the same thing but arrived at in different ways. If you type a set of quotation marks (") unexpected things can happen. The alphanumeric keys will behave in the same way as before but the control keys won't. If you press a cursor key the cursor won't move. Instead a reversed symbol will appear on screen. If you press CTRL and the 9 key together, instead of getting reversed images as you would in direct mode you get another strange symbol and your text remains unreversed.

Quotes mode operates as a kind of delayed instruction to the Vic. It stores the keypresses as a string and only executes the commands—cursor movements, colour changes etc—when that string is printed.

What can throw you out—and it happens to old hands too—is that sometimes the Vic will remain in quotes mode when you think you've left it. You can see the effect quite easily: type a quotation mark on screen, delete it, then hit the cursor keys a few times. Instead of leaving quotes mode when the quotation mark is deleted, the Vic continues in the mode until it encounters another quotation mark.

The same effect will occur in insert mode. Press the shift and del keys together, then hit the cursor keys. You'll see the Vic acts as if it was in quotes mode.

These effects will most often catch you out when writing a PRINT statement in a program. You can quite often find yourself in the wrong mode and the program line will not behave correctly. If you enter quotes mode accidentally, type another quotation mark then delete both and

everything between and you'll get back to normal. Alternatively, hold down Shift and press Return. This gets you out of the line without committing it to memory. Using the cursor and delete keys you can then edit the line to its proper form.

All of this sounds a great deal more complicated than it really is, and it's adequately explained in the manual that comes free with your Vic.

Before you load up the first game, before you attempt to type in your first listing, get to know your machine. Half an hour spent playing around with the keyboard will save you a lot of grief later.

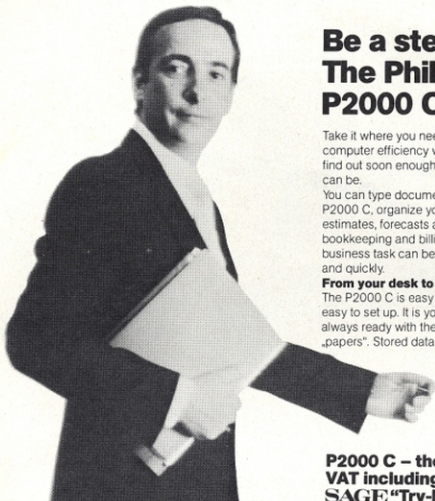
And remember the first rule of computing: if it doesn't work, you've done it wrong.

CONTROL CHARACTERS

■	CTRL	BLK
■	CTRL	WHT
■	CTRL	RED
■	CTRL	CYN
■	CTRL	PUR
■	CTRL	GRN
■	CTRL	BLU
■	CTRL	YEL
■	CTRL	RVS ON
■	CTRL	RVS OFF
■	HOME	
■	CLR	
■	CRSR	DOWN
■	CRSR	UP
■	CRSR	LEFT
■	CRSR	RIGHT
■	INST	
■	DEL	
■	F1	
■	F2	
■	F3	
■	F4	
■	F5	
■	F6	
■	F7	
■	F8	



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NEW AGE OF

AQUARIUS

Aquarius makes a come-back under new management — David Guest reports on a contender for the Spectrum/Vic markets.

If you walked past a cinema and saw 'Aquarius II' up in lights you might well mutter: 'Hmm, another cheap follow-up.'

Radofin Electronics' Aquarius II doesn't quite fit the bill. In the first place the original Aquarius had such a rough ride that the II has very little to cash in on. In the second, although Radofin hasn't strained its imagination unduly the Aquarius II has more to offer than its predecessor; and so, in the third place, it isn't as cheap.

The II is due to be launched in September and the price is likely to be around £130. Breaking with convention it will, at its launch, have a reasonable range of peripherals available and a selection of software. This is because it is compatible with the Aquarius I. The Aquarius II improves on the original most obviously in its Basic and its keyboard. But they are far from being the same machine.

Presentation

That said, several features of the review machine must be considered provisional. The packaging is one — it has Mattel

ideal. Clearly and straightforwardly they take you through the system and its Basic, and although the fragments of programs that are used to illustrate Basic commands are hardly the most inventive you could find, they do at least make the point.

Both manuals warn TV owners: 'Some stationary game patterns produced by this product may be permanently imprinted on Projection TV tubes by extended use at high-brightness levels.' Since the European Championship was approaching its climax I didn't check this out.

Construction

The Aquarius II is roughly the size of a piece of foolscap paper, which makes you marvel once again at the accomplishments of Kyocera, Epson, Hewlett-Packard and others who can cram up to 272K into an A4-sized machine.

But they cost hundreds, sometimes thousands of pounds, and those LCD screens aren't much use when it's a game of Dune and the Sand Blasters you want. The II, a more modest micro, is a workmanlike piece of construction in beige and black

Electronics printed on it alongside a bold picture of the Aquarius I. Part of Radofin's inheritance from Mattel (see box) was a large number of cardboard cartons.

The box holds the system itself, further protected by a plastic bag, and in a separate compartment the power supply and a television lead. The TV cable runs into a switching unit that lets you turn from the Aquarius to Coronation Street as easily as changing channels.

Documentation

More of the Mattel legacy: one of the two items of documentation, the Aquarius Guide to Home Computing, is labelled Copyright Mattel 1982 and the other, the guide to Extended Microsoft Basic, is from Radofin.

In the review of the Aquarius I (issue 7) PCN said: 'The Aquarius documentation is best described as superb'. (We also said: 'Mattel has the resources to succeed', but nobody's perfect.) The extended Basic manual indicates that Radofin is going to maintain the style set by Mattel when the original machine was launched.

So far, so good. But the Aquarius II seems likely to be much more a programmer's machine than the I, and the slant of the documentation — towards people starting from scratch — may frustrate those of you who want to know why things happen instead of being assured merely that they do.

For novice users the manuals should be

moulded plastic.

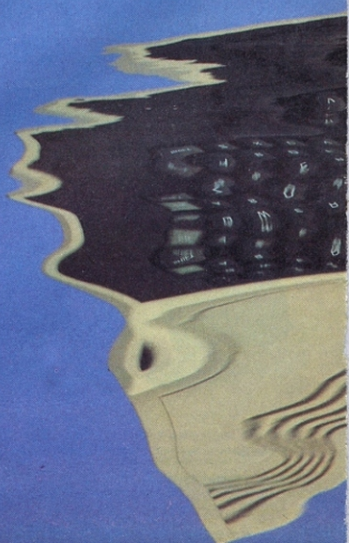
Unlike the Aquarius I, the II has a genuine keyboard and expansion units that sit flush with the casing. The box rests on four short rubber feet, and there are ventilation slots in the base and on the top, to the rear. The case creaks a little but seems solid enough.

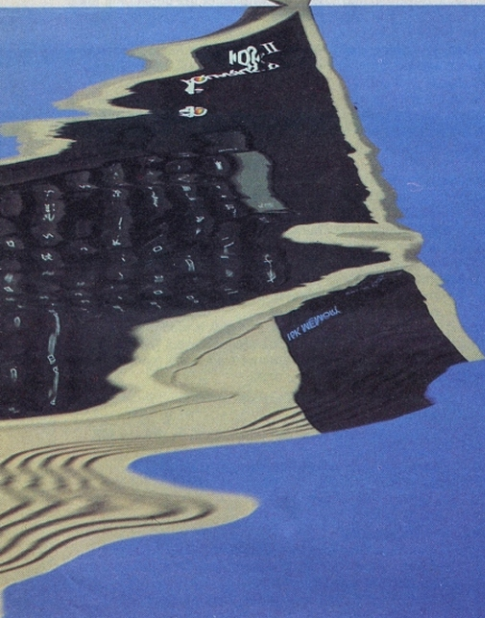
On the right hand side there is an on/off switch and alongside it a recessed reset key. At the rear of the machine are, from left to right, the expansion socket, TV, printer and cassette ports, and the power point.

Keyboard

It's worth paying some attention to the keyboard — Radofin claims the II will be the cheapest micro with a real keyboard when it is launched. This overlooks that hardy annual, the Vic 20. There are 49 keys including the space bar, and the keys (slightly sculpted) are swept upwards from the front of the machine.

Most of the keys have three functions: besides upper and lower case there are additional features offered by a simultaneous depression of the control key. Most of these are Basic keywords but there are also some editing commands; Control Space, for example, gives you `CHR$`, while Control 9 gives you `COPY`. These third functions are printed on the front of the keys and this makes the gentle gradient of the keypad even more valuable. If the absence of a `PRINT` key seems a strange oversight, try??.





The keys themselves have a pleasant spring to them. However, there are no programmable function keys and no cursor cluster; these could prove to be serious shortcomings in a games machine. Nor is there a Caps Lock.

Less of an oversight, more of an inconvenience is the fact that of the 256 characters (including graphics) only about 40 per cent are directly addressable from the keyboard. It's a trade-off; either you discipline yourself to use ASCII codes or you accept the confusion of a keyboard festooned with symbols.

In use

Radofin supplies 10ft of cabling between the Aquarius II and your television, and the first thing to note about the machine in use is the variety of comfortable poses you can strike with it.

Connoisseurs of the Dulux colour charts will recognise the Aquarius II's main display as duck-egg blue (undercoat). The other 15 colours are strong pastels. The orange appeared dark brown on my television, but if you're going to have it permanently imprinted on your tube dark brown may be preferable.

The display is 38 by 24, which restricts the degree of detail you can achieve from a Basic program. Filling the screen with colour from a Basic program is a leisurely process.

The Basic, as noted, is Microsoft Extended. This is one of the II's main advances over the I. Another, associated advantage, is the inclusion of editing features.

The Extended Basic gives you such extra commands as CIRCLE, DRAW, and LINE — these are also present on the keyboard, via the Control key.

One strange feature crops up when, playfully exploring the maximum line length, you try to exceed it with a Basic keyword: the bell rings (more of a ping, in fact.) The number of rings it emits corresponds to the number of letters in the keyword. This eccentricity may be included as a labour-saving way of discovering the number of letters in such words as DIM, CIRCLE and ON, who knows?

System commands are rudimentary but this is hardly the kind of machine you'd be developing an interactive stock control system on.

The Aquarius II's command of sound depends first on the speaker of your television and second on the SOUND command with its parameters of duration and tone. This isn't as limiting as it might at first appear; playing around with the parameters reveals a decent range, which can be further expanded by putting the SOUND statement inside a time-delay loop.

Aquarius I software should run unaltered on the II, and Radofin expects to be able to offer cartridge software for the new machine. There is in the wind a whisper of a disk system that might also operate with the Spectrum. It should be a sub-£100 unit with two 3in floppies.

The machine's graphics are the same as the I's, that is to say unspectacular.

Expansion

The basic Aquarius II may be a 4K machine. This trifling memory can be augmented by 16K and 32K expansion units, and at these levels the machine's 2.7K operating system looks less expensive.

The peripherals already available include a four-colour printer for £120, a data recorder for £39, a thermal printer for £100 and games paddles and expansion chassis featured in our review of the Aquarius I. ('As a first machine it would appear to be an excellent choice.')

Support

There are three crucial aspects to the matter of support. When a micro is the successor to a machine with the history of the Aquarius I, the would-be buyer should look at these carefully.

There is the question of the manufacturer's commitment and prospects. It may be that Radofin's commitment can be judged from the fact that it is still in the market. Moreover, it plans an Aquarius III, and says the Aquarius I was always intended to be the first machine in a completely compatible range.

Radofin's prospects are by no means tied to the success or failure of the Aquarius II. Its peripherals are aimed at Commodore and Sinclair users — everybody likes to back an occasional winner — and it has fingers in other promising pies outside home computers. It is also a part of the highly diversified Fobel International group.

But the prospects for the Aquarius II may hinge on Radofin breaking out of the vicious circle that has helped to send under such companies as Jupiter Cantab and Computers. A new micro needs plenty of software to attract buyers, but the software houses need a large potential market to persuade them to write software for the micro. Radofin claims the Aquarius I has already started to break the grip of this iron law.

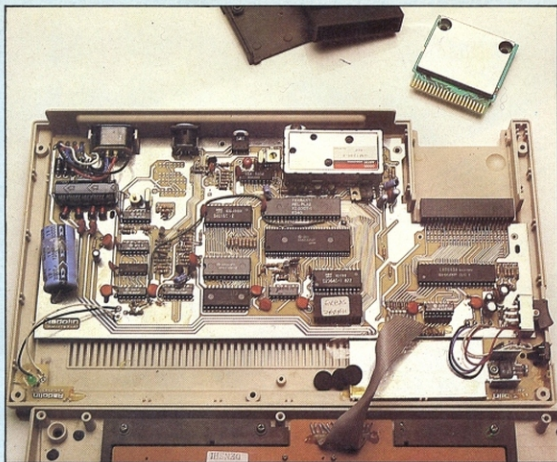
Then there is the question of reliability. Radofin became a marketing company virtually by default — originally it was a design and manufacturing outfit. It argues that this background gives it an edge: 'Had we designed it (the Aquarius I) for ourselves we might have cut a few corners to bring the price down,' says export manager Gary Leboff. 'But there is no benefit for an OEM manufacturer ever to make something that doesn't work.'

The statistics of this argument are that on Radofin's Hong Kong production line every sixth person is engaged in quality control. The company claims that as a result dealers such as Argos and Asda have seen return rates of less than 0.5 per cent.

Verdict

In a summer where Lancashire reach the final of the Benson and Hedges Cup anything can happen. The Aquarius II might be a success. For its price it is an uncomplicated and responsive machine, but that may not be enough.

PCN



The machine's built-in memory may be small — leaving plenty of open space on the circuit board — but 16K and 32K expansion units are easily slotted into the port at the back.

A look into the past — and the future.

In August last year the Aquarius I was launched by Mattel Electronics. A Z80 micro with a Spectrum-like keyboard, it cost £79.95.

The machine had been designed and built by Radofin Electronics and the hardware had been ready for launch several months earlier. The delay was caused by Mattel, which wanted to make changes. One result was the widely-praised documentation, but another was that the home micro market had already started to overtake the Aquarius, and a period of fierce price-cutting was under way.

The price of the Aquarius had been cut twice before it was even launched. Originally planned to cost £109.95, it came down to £99.95 when Sinclair cut the price of the Spectrums.

In September Mattel almost halved the price of a 16K RAM expansion pack for the machine, bringing it down to £29.95. Just two weeks later, having lost \$200 million in the second quarter of its financial year, it brought the price of the system down to £59.95. The company lost its UK managing director at the same

time. Meanwhile, it was alienating some important dealers. Shortly before one of the price cuts it had delivered a batch of machines to a major high street chain with no warning of the impending price movement.

In October Mattel threw in the towel. Pulling out of home micros, it handed over the Aquarius to Radofin. The price fell to £49.95.

Radofin, now a marketing company as well as a designer and manufacturer, set about rehabilitating the Aquarius among dealers. It also promised more software, and the Aquarius II was mentioned for the first time.

The timing of the Aquarius II's launch in September has been determined by a number of factors. The company points out that some possible competitors have dropped out of the home micro business and that some others have declared their interest in moving towards business systems.

But it also acknowledges that there could be a credibility gap. The Aquarius II is an attempt to add a few more girders to the bridge.

SPECIFICATION

Price

To be decided. The 4K model will probably be £89, the 36K model £130 to £140.

Keyboard

Typewriter-style. 46 keys plus two shifts and space bar.

Processor

Z80

RAM

4K or 36K models likely

Textscreen

38 by 24

Storage

Cassette recorder

Interfaces

Expansion chassis for additional memory and cartridge software, television output, cassette port, serial printer port.

Language

Microsoft Extended Basic

Distributor

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PCN PRO-TEST PERIPHERALS

P's capabilities, whether drawing a Space Shuttle and that star hero R2D2, or plotting pie charts and mathematical functions. Some of the programs were interactive, allowing data to be entered, such as the perianal biorhythm program and a simple graph-plotting routine.

What can be done, and how, from Basic takes up a whole section of the manual. The physical plotting area measures 1838 x 2500 units; in fact, the Sweet P's memory can hold an area of 65536 x 65536 points, of which the physical part is only a small section. The manual said this memory can be used to hold a large drawing which can then be drawn in sections.

Unfortunately, there are no instructions on how to go about this — though it is possible to use a long thin strip of paper 121in by 8 1/2in and draw pictures on this.

The plotter units are 0.1mm apart making the Sweet P pretty accurate. The smallest text that can be plotted directly is 20 units high (2mm), the largest is 240 units. These are accessed with the TX command allowing drawings to be fully labelled.

Documentation

A single thin spiral-bound manual covers everything from unpacking to a set of basic demonstration programs. All you need to use the plotter is included and all the plotter commands are covered in detail, with pictures showing exactly what each one does. Two unusual built-in commands are the AX and AY for plotting graphs.

Following the basic commands are a set of demonstration programs, with pictures, written in Microsoft Basic. These take the user through all the steps of drawing a graph with axes, labels, and titles.

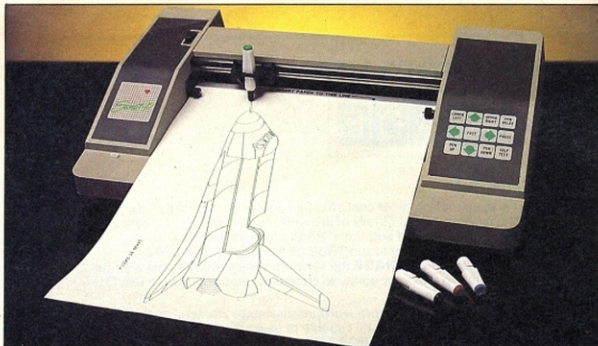
Verdict

For fancy looking graphs and pictures the Sweet P model SP 100 is a very nice add-on.

However, at £573 the Sweet P is overpriced for what it does, and it lacks a standard Centronics interface. But it did perform well and accurately. **PCN**

Product Sweet P model SP 100 Price £573

Distributor HAL Computers, Farnborough, Hants GU14 7QU Tel 0252 517175.



QUICK ON THE DRAW

A sweet alternative to printers; Kenn Garroch looks at a plotter.

All the commands needed to produce sophisticated pictures and graphs with ease are available with the Sweet P model SP 100 plotter. It is a good example why a plotter is thought of as one-up on a printer, i.e. it is more versatile and draws the pictures instead of printing them.

Presentation

The Sweet P comes in a medium sized cardboard box containing the plotter, the connecting lead, four coloured pens (red, green, blue, and black), a carton of A4 paper, and a manual including a demo disk.

The plotter which measures 35cm x 22cm x 9cm is field-grey and has a touch-sensitive control pad on the right, the plotter mechanism being in the centre. This touch pad allows the pen to be moved to various positions on the paper. As well as pen up, pen down, and pause, there is a self-test button that makes the plotter jump around all on its own.

The plotter operates by moving the

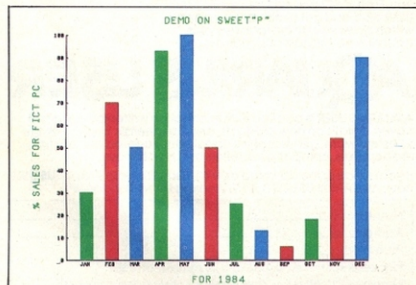
paper vertically and the pen horizontally. The paper is moved with two small rollers that pinch each edge — the pen is moved with a pulley system giving full XY positioning. The review machine seemed to have been around for quite a time as it was a little rattley and the pen would not lift up properly at the home position. Either the plotter had been bounced around a bit or it is not very durable — the former is more likely.

Setting up

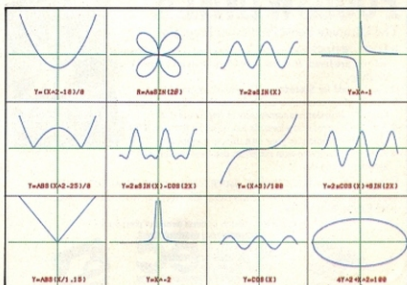
Signals to the printer are input via a 20-way insulation displacement plug. All the signals for implementing a Centronics interface are available on this. The connector supplied with the review model was for an IBM PC but this went straight into the Centronics port.

In use

The demo disk, for the IBM PC, contained a number of programs to demonstrate the

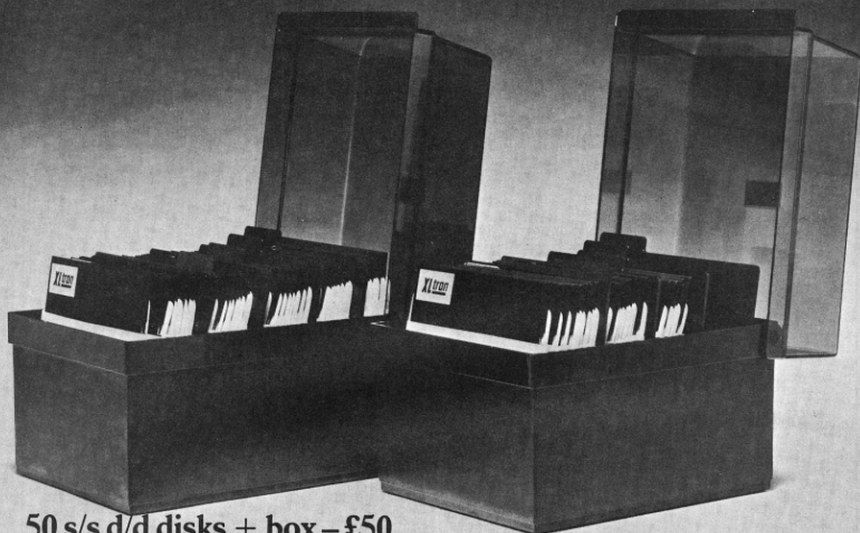


This bar chart shows how the Sweet P fills in with solid colour.



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BBC in overdrive

The Hobbit tape filing system now has more strings to its bow as David Janda discovered.

As souped-up version of the Hobbit tape filing system for the BBC micro, called the Ultradrive, is now available from Ikon, the makers of the original. The main difference between the two is the Ultradrive's more sophisticated software.

Presentation

The system arrives in two main parts, the Ultradrive and an 8K EPROM, with a set of utilities on tape and a manual in tow.

The Ultradrive is a Phillips digital mini-cassette unit housed in a cream casing that rests on four rubber pads. The cassette door and the eject switch are on the front.

No other manual controls are provided since all necessary drive commands are operated from the software on the EPROM.

Two cables are attached to the drive—the first is the power cord which plugs into the Beeb's auxiliary power supply, and the other a multi-way ribbon cable that plugs into the user port.

Setting up

The Ultradrive tape filing system, on the EPROM, can be fitted into any of the spare sideways ROM socket in about five minutes.

Fitting the Ultradrive itself proved slightly more difficult as the cables were a bit short: 16in for the ribbon cable and 20 for the power cord. So, not much room to manoeuvre.

Attaching other peripherals at the same time as the Ultradrive is out of the question: the Ultradrive has no power-in socket which means the single power output on the Beeb is taken up.

Features

The real feature of the system is the software that controls it. It is possible to move the tape backwards and forwards

under software control, so files can be found quite quickly.

From the tape user's point of view, the Ultradrive has much to offer. All the star (operating system) commands described in the user's guide are supported, with several more specific to the Ultradrive.

There are two operational modes: the first is a simple filing system, allowing one drive to be used with a single file open.

Pressing the 'V' key and BREAK initialises the complex filing system, where up to five files may be opened and two drives used at once.

To cut down the access time for a particular file, each side of the tape is further divided into two loops. A single loop has its own directory holding up to 31 files.

The standard amount of space for one side of the tape is 75K, though an increase through changing the size of the interblock gap is possible. On default, this is set to 140 ms, but adjusting the value held in location &111 lets you decrease the gap. Obviously, the smaller the inter-block gap, the greater the possibility of read errors occurring.

Each file has a letter assigned to it in the directory and pressing the control key plus the letter auto-loads the file.

In use

A set of utilities is supplied on a system tape with the unit. Some of these star commands are held as files, *FORMAT being one. It's a pity a 16K EPROM wasn't used, as this would have allowed more commands to be available from memory instead of having to access the tape.

As far as speed is concerned, the Ultradrive is six to seven times faster than ordinary cassette.

Further, and just as important, the Ultradrive is a digital tape unit which, in

tests, gave not one single read error.

Random access as well as sequential files are supported and transferring software from tape to Ultradrive was easy. This also applied to transfers from disk to Ultradrive, thus the Ultradrive can be used for archive purposes.

For someone used to a disk system, it soon adapted to the Ultradrive.

Verdict

For £80 the Ultradrive is good value. Initially I was sceptical, but no longer. For those who do not wish to fork out for disks, the Ultradrive is the best alternative. If you already have disks, the Ultradrive can be used as an archiving system with no trouble. All in all, this system is highly recommended.

● In addition to the star commands described in the user guide (including *OPT), the Ultradrive supports the following:

*FORM name	Formats a new tape, supplied on the utility cassette.
*SWAP	Swaps between loops.
*REWIND	Re winds the tape to its physical beginning.
*KILL	Deletes all files on the current loop.
*DRIVE n	Select drive n
*ULTRA	Initialises the complex filing system.
*ULTRAU	Selects the simple filing system.

PCN

Product Ultradrive System BBC A or B
Manufacturer Ikon Computer Products, Tel 099 421 515 **Price** Ultradrive £79.95, pack of six cassettes £20.13 (possibly cheaper from Boots).

SOFTWARE

• WHAT'S NEW • WHAT'S NEW • WHAT'S NEW •

Note to software publishers: If you wish your company's product to be included, please send only the very latest releases to Bryan Skinner, Software Editor, PCN, 62 Oxford Street, London W1A 2HG; and please don't forget to include prices and a telephone number.

Hareraiser was launched at the BBC Micro Users' Exhibition and is 'the first ever computer treasure hunt' — maybe Haresoft hasn't heard of Pimania? The treasure is either the golden jewelled hare (which readers may recognise as the trow from Kit Williams' book 'Masquerade') or £30,000. The program comes in two parts, the second to be released in October. Each part will cost £8.95 and provide 'clever clues and amusing graphics' from which you should be able to deduce the whereabouts of the treasure. Versions of the programs will also be available for the Commodore 64, Vic, Oric, Dragon and Spectrum, and users will have to register with Haresoft to enter.

Mirrorsoft continues to produce good quality software, and not just in the educational field where it started. *Hi Bouncer!* for the BBC may be based on Roger Hargreave's popular children's characters, the Mr Men, but is a very well-produced arcade type game from H & H Software. Nice touches are a practice program which allows you to alter the speed of the game, a pause facility and sound volume control. Both the

practice session and the arcade speed game have four screens of eight versions each, just to keep you on your toes, and the graphics and sound are very good indeed.

Runesoft has added to its range of Spectrum adventures with *Robyn Hode*. This is a machine code adventure with over 400 locations and 120 commands, set in the 13th century and has been researched to the extent that the programmers made reference to the Domesday book and old maps to ensure that the settings were as historically accurate as possible. The adventure is in two parts, making it one of the longest available for the machine.

Flight 401? for the Oric/Atmos is a fairly primitive, instruments-only flight simulator. The screen display is limited to a few dials, an artificial horizon and various figures such as altitude and 'aircraft', which isn't explained in the instructions. According to the cassette cover, your task is to 'rewright (sic) history and successfully fly Flight 401 avoiding

its untimely end'. The program appears to be written in Basic and, because the screen update is pretty slow, you don't fly in real time at all. There are flight simulators and flight simulators — this is not one of the best.

Because it's summer, the amount of new games released per week is dropping. At this time of year the emphasis is on converting programs for other machines, and this week saw a number of these.

For the Commodore 64 there's *Blue Thunder* and *The Oracle's Cave*, (converted from the Spectrum), *Classic Adventure* for the BBC/Electron, a BBC version of *Jetpac* and for the first time, an Amstrad CPC64 program. *Classic Adventure* was originally translated for the Spectrum and Commodore 64 from the original 70K, text-only, mainframe adventure.

Terminal's *Star Commando* is disappointing given the features of the Amstrad. It's a pretty standard variant of *Star Trek*, combined with shoot-em-up, but you only ever get three aliens at a time. The graphics

are limited, though there's a fair attempt at sprite handling, and the sound is poor. Let's hope the next batch of Amstrad software is better, but it looks as if owners of the new machine will have to be prepared to fork out £8.95 as a standard price for games — rather pricey.

Another conversion is Dolarsoft's *Suicide Island*, moving from the Spectrum to the BBC and Electron. It's a two-part adventure and you have to complete the first bit to get into the second.

Educational

The Vic 20 may not be found in many schools, but now Chalksoft has converted its well-received educational program *Decimals* from the BBC. Aimed at the nine to 14 age range, its four parts cover most of the decimal handling rule and automatically adjust the difficulty level according to your progress.

From CDS comes an audio tape to accompany the company's vocabulary learning packages, *French is Fun* and *German is Fun*. The tape has words spoken by native speakers, the idea being that you can practice your pronunciation as you run the program (reviewed in PCN issue 57).

For would-be machine code programmers, New Generation has released two versions of its *Machine Code Tutor* for the Commodore 64 and any 32K Atari.

AMSTRAD

Star Commando £8.95 Terminal 061 761 4321

ATMOS/ORIC

Flight 401? £6.95 Knight Products 0282 842992

ATARI

Machine Code Tutor £14.95 New Generation, 15 Sunnybank, Lymcombe Vale, Bath

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DOUBLE FILE

A database program generator gets Nick Rann's approval.

Sci-File comprises two programs — Program Generator 1 (PG1) and Report Program Generator (RPG). The aim of the package is to generate programs which give the best of both worlds to the end user who has limited programming knowledge but who nevertheless needs a database/report program tailored to their specific requirements.

Typical interested users would include small, home-based businesspeople and enthusiastic 'home economists'.

The finished programs generated by Sci-File work independently and are capable of generating their own data files, thus saving time normally taken to load multiple programs in the more traditional 'database' set-up.

Presentation

Sci-File is supplied on two separate cassettes (PG1 and RPG) each containing 16K and 48K versions and packed in a slimline silver box. Enclosed is a 20-page instruction manual suitable for either a slow or fast learner.

There are also blank planning sheets provided so you can keep tabs on your own program designs. Among the sheets are several worked examples.

Program Generator

Datafile formatting: Once part 1 is loaded you are offered the option to create a new file format or amend a previously saved version. A data item or field may be of four types — alphanumeric, numeric, date or £ sterling (ie numeric, automatically assigned two decimal places for the pence). You assign the name, type, size and number of decimal places to each field — up to 19 fields can be created on any one datafile.

The program prompts you helpfully through the formatting, which allows you to check each definition as you go. Once you're satisfied with the format, each field is designated a numerical position, so you can give the computer the numerical location of the fields which you want to use to identify each file for cataloguing and retrieval purposes. But beware — the program does not accept locations exceeding 99 (ie two digits in length) so make sure your identification fields are early on the list.

Program generation: Once the format file is saved for later use or amendment, the remainder of PG1 is loaded. This effectively establishes the newly generated format into the memory of the computer and creates an independent Basic program. The program is menu-driven and self-explanatory options appear. See figure 1.

Having taken option 7 and saved the program you can use the program by

inputting data in your own prescribed format. With PG1 you can print out all, or simple selections of, records to be amended or deleted. Completed datafiles may be saved for future use, either with PG1 or RPG without limit to their number.

Report Program Generator

Format integration: RPG allows you to develop further the datafile format files created with PG1. As in PG1 a Basic program is generated from the user's self-defined format but now a full report of a more complex and controlled nature is possible.

With RPG Part 1 loaded, you are prompted to load an existing format file and then asked to give your proposed report a title.

Calculations: The program prompts you to set up and define the calculation you want to perform on your choice of existing numeric and £ sterling fields.

Fig 1 MENU

- 1 INPUT ITEMS
- 2 AMENDMENT
- 3 PRINT ITEMS
- 4 FIND & PRINT
- 5 SAVE FILE
- 6 LOAD FILE
- 7 SAVE PROG

First, you define the fields (prefix C) required to store the results of your calculation. Next, you indicate the calculation itself and state which fields (simple or previously calculated) you would like it performed on. Calculations can be addition, subtraction, multiplication, division or exponential (to the power of), so percentages require two calculations.

You may select the records you would like included on the report by stipulating field conditions and comparisons, which must be fulfilled in any record included in the report. In the example in figure 2, #

Figure 2				
Selections	Condition	Field	Comparison	Field
S1	IF	1	>=	3
S2	AND	C3	<	#100
S3	OR	C2	>	#99

denotes an arbitrary numeric value of your choice.

It's possible to total all of the numeric or £ sterling values in either datafile records or calculated fields. A practical example would be if each record contained details of the price and stock quantity of a certain product. A calculated field (ie C1) may contain the value of each selected product (ie price x quantity) and to add up all C1 values would give the total value of all selected stock items.

Keep track with Sci-File blank planning sheets.

Report setting and formation: Report formatting can be spread across 32 or 42 columns/lines (32 only on 16K version). Column headings can be written into the program and there are column guides featured on the screen to help with formatting their position. By responding to prompts asking for the number of spaces and field identification you are able to format the actual data to fit neatly under the headings and the whole program starts to take shape.

Program generation: The next step is to load the remainder of RPG and, this done, your report program is generated almost immediately. The report program offers the same menu as PG1 but with an eighth option — Report.

In use

I created programs suggested on the enclosed planning sheets which I found a great help in unravelling the comprehensive, if lengthy, instructions. I decided to create a program to highlight the parlous condition of my personal finances and was able to put together a useful (if depressing) package in under an hour.

Once created, the program and datafiles can be loaded up fairly quickly but it is important to plan for every report requirement at the outset as effecting format amendments can be a lengthy process.

The ZX printer may be used to print out the reports from home or office.

Verdict

Two useful programs capable of providing reports of professional appearance to the small business user. Sci-File certainly takes the donkey work out of program design without compromising flexibility.

PCN

RATING (/5)

Features
Documentation
Performance
Usability
Reliability
Overall value



Name Sci-File Application Program Generator
Price £19.95 Spectrum Format Cassette
Publisher Visions Software Factory, 01-748 7478
Outlets Retail/mail order.



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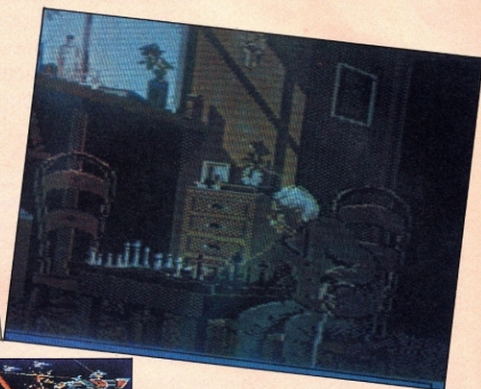
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COMMODORE vs CANVAS

Keith Mason dabbles in the arts and wonders whether computer graphics will replace canvas and brush.



Picasso wouldn't approve and Rembrandt would turn in his grave at the idea of a high-tech gadget becoming an artistic medium. Well, stranger things have been used, including the jetstream of a Boeing 737 to blast paint onto a canvas, so why not the Commodore 64.

With this in mind, Kuma Computers has scoured the depths of downunder and come up with Paintpic, a complete painting and drawing system developed by the New Zealand company Kiwisoft.

The publishers claim great things for Paintpic, notably that it is so good that a professional artist can use it to produce publishable work and is yet so simple to operate that it is just as suitable for first-time computer enthusiasts.

Enough of these maker's claims. Bearing in mind my artistic inability, let's see if it's all it's cracked up to be.

In use

You might think that with a 58-page manual to wade through, actually getting started is going to be a rather formidable task, but never fear. Paintpic scores right from the beginning. American spelling apart, this is the ideal manual, comprehensive and simplistic. Little manual 'debugging' is required as it takes the user step by step through the basics, working by example to get you quickly into a position to start painting.

The program itself takes only about 7 minutes to load and you get into the drawing screen by answering a series of simple questions. The demonstration 'rose' designed to show some of the system's capabilities even has a bypass facility for the frequent user.



Some samples of the degree of detail available using Paintpic. Top left, a version of the *Roqueby Venus* — would Velasquez have been impressed?

The drawing implement is designated by a crosshair on the screen. Additional markers indicate the painting mode and whether or not the print is on. Painting is achieved by moving the crosshair around the screen with the point on using either a joystick or designated keys for horizontal, vertical and diagonal movement. Erasing what has already been painted is a simple task of repainting in a different colour.

Four colours are available at one time in any combination from the full range of the 64. You can use pen, brush or text mode, though with 32,000 dots in the painting area pen mode can be a delicate but slow method. A brush mode with individually definable bristles and brushes, which can be stored and retrieved at will, enables large areas to be coloured quickly. The text mode places the full range of the 64's text and graphics characters at your fingertips.

To take the drudgery out of moving the crosshair around the painting area, nine home positions, accessible by a single keystroke are dotted around the screen. In addition there are semi-automatic drawing facilities. Drawing a triangle, for example, is a simple process requiring two corners to be marked with the third indicated by the position of the crosshair. The triangle is automatically drawn once the T key is

depressed. Other facilities include straight lines, boxes, circles, parallelograms, ellipses and arcs. Using these facilities with the paint turned on automatically colours in the enclosed areas.

Similar facilities, described as block operations, enable things that have already been painted to be copied to different parts of the screen, mirrored, rotated, doubled or halved by marking a box around the object and hitting the right command key. Paintpic also allows midpoints and perspective points to be automatically designated.

Saving all or part of what has already been drawn is relatively easy and menu-driven.

Verdict

You don't have to be the world's greatest artist to have fun with Paintpic. It is extremely versatile and well thought out. The manual even explains how to photograph your creations direct from the screen; gives subroutines to incorporate pictures in your own programs and explains how to use sprites.

RATING (/5)

Features
Documentation
Performance
Reliability
Usability
Overall value



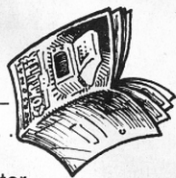
Name Paintpic Application Graphics Aid Price
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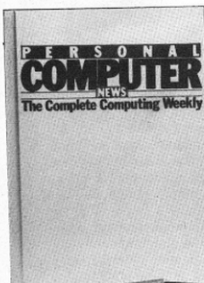
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BBC MICRO B

Flight of fancy

Name Aviator **System** BBC Micro **B Publisher** Acornsoft, 4a Market Hill, Cambridge CB2 3NJ **Format** Cassette/Disk **Language** Machine code **Outlets** Mail order and dealers

It's one thing to climb into the cabin of your 747 every evening and take your BBC jumbo for yet another tour of the airports of Britain. It is quite another to heave a Spitfire off the ground, navigate by landmarks and locate your home airfield somewhere in a rather barren area of America. As if this were not enough, falling victim to one of the most unlikely plots ever dreamed up for a sci-fi epic could transform your evenings completely.

Objectives

The first and most important goal is to learn to fly your Spitfire. After that, you can attempt a variety of reckless manoeuvres or set out to save the world from yet another attack from misguided aliens.

In play

Aviator is packaged in Acornsoft's usual folder, containing either cassette or disk and a number of useful documents. The 26-page manual is full of information on all aspects of the simulator. In addition, an enlarged keyboard control diagram and map of the area immediately surrounding your airfield are included.

The program will run with

either keyboard or joystick input, though joystick control is considerably easier.

The code takes several minutes to load and uses most of the space available when running in Mode 5 — a peculiar choice in itself, since the display is entirely white on black and a Mode 4 screen would have provided twice the resolution.

Once airborne and at a reasonable height, it is fairly easy to fly about and visit the suspension bridge or Acornville, two of several features which are plotted in simple line graphics as you venture round the pseudo-world created within the program.

It is also rather too easy to induce a sickening spin and end up in a heap in a field. This is a much harder simulator to fly than some earlier offerings, but also very rewarding, as it offers you the chance to fly under and around real obstacles, scoring points for successful aerobatics.

As a final challenge, you can play The Theme and attempt to protect Acornville from marauding alien aerobatics which grow up in the fields.

Verdict

Acornsoft has succeeded again in creating an ambitious program with the limited memory of a BBC Micro. All credit to the programmer for what seems a very well researched and executed simulation.

Simon Williams

RATING (/5)

LASTING appeal



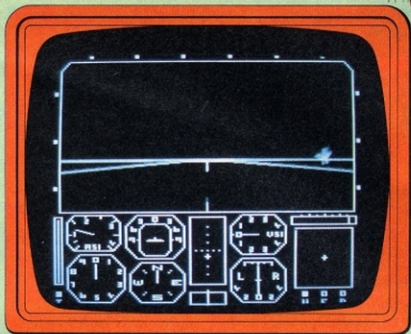
PLAYABILITY



USE of machine



OVERALL value



Pirate's treasure

Name Flint's Gold **System** BBC Micro **B Price** £6.95 **Publisher** Micrograf, 120 Oxford Road, Reading, Berks RG1 7NL **Format** Cassette **Language** Machine code **Outlets** Mail order/retail.

Revisit Treasure Island accompanied by Long John Silver, in this adventure that makes use of the chunky graphics of mode 7.

Objectives

Following the storyline of *Treasure Island* fairly loosely, you must journey to the island and search out the gold hidden there by Captain Flint. All the time Long John is peering over your shoulder to ensure he's included in the final share out.

In play

The cassette is simply packaged in a standard library case, the program is sensibly recorded on both sides of the tape and proved no trouble to load. A two part rendition of the sailor's hornpipe whistles away the loading time, complete with seagull cries and the crash of surf on the sand.

At the start of the game you sit in the local tavern, the Black Lagoon, and overhear the tale of Captain Flint and his barbaric deeds, not to mention Flint's legendary hoard of gold, stashed somewhere on the Spanish Maine.

The first step is to find safe passage from the small port where the adventure starts to the island where lies the treasure. Several ships wait at the jetty but only one is going your way...

When you finally get a berth, it's anchors aweigh and the first short graphic which shows the ship setting sail.

All the sequences are fairly basic, but the element of surprise on encountering each new illustration or sound effect makes the game fun to play, as do the responses to your commands — comments like 'Aye, aye matey' and 'OK, Jim lad' abound.

On arrival with Long John in tow, you enter the extensive complex of underground caverns which forms the bulk of the adventure.

Once in, a number of illustrated events take place with, you hope, the discovery of a chest of doubloons as the reward for all your efforts.

I must admit to be still struggling to cross the lake without being eaten by an alligator. The game may be saved and reloaded at any stage of play.

Verdict

The idea of using teletext graphics to illustrate an adventure is not brand new, but the pictures used in *Flint's Gold* are well executed and animated in machine code giving a rapid response.

The adventure itself is straightforward, but I for one find the concept of an adventure where I can make fair progress in a few hours refreshing. This is one of the few games where the original is a pirate copy.

Simon Williams

RATING (/5)

LASTING appeal



PLAYABILITY



USE of machine



OVERALL value



You are in a dimly lit back street with shuttered shops lining each side. The road leads EAST from here.

TE You are in the street leading EAST and WEST. The entrance to the Jetty is NORTH.

TE You are in the street. To the EAST is the entrance to a shop. The road leads WEST and SOUTH.

There is a Gold Doubloon here. TAKE DOUBLOON O.K. MATE.

TS You are in a narrow alley behind the Seamans Mission.

An old sailor steps from the shadows and seeing you... grabs your arm and says, "Name's CUFFY say hello to Flint for me." and runs off.

ATARI

Sticky habits

Name Captain Sticky's Gold
System Atari (16/32K) 400/800/XL
Price £9.95 **Publisher** English Software, Manchester 061-835 1358 **Format** Cassette **Language** Machine code **Other versions** None
Outlets Retail/Mail order

When I want a packet of chewing gum, I just nip into the nearest confectioners. But not Captain Sticky, that would be too easy.

Objectives

The cassette inlay details a preposterous plot, but don't let it put you off. Captain Sticky has a secret vice — he's a chewing gum addict. As he's a bit short of ready cash, he must dive to the bottom of the sea in search of gold in order to maintain his habit.

Down below, all is not sweetness and light — fish, leeches and monster crabs all show signs of belonging to an anti-gum organisation.

In play

A rollicking nautical tune, reminiscent of A Life On The Ocean Wave, precedes demonstration.

On screen is a view of the ocean depths with enough swimming fish to make an angler drool.

On the sea-bed are three platforms, towards one of which a bar of gold drifts to rest. On the surface, Captain Sticky, in full diver's rig, prepares for a

dip into the briny.

He is attached to his boat's jib by a lifeline. Colliding with a fish cuts the line, causing a Sticky end.

He can harpoon the fish but not the air leech, a white amorphous wobbler which sucks away some of the Captain's oxygen on contact.

A gauge shows the amount of air left — the supply is replenished on return to the surface. Once a gold bar has been reached by Captain Sticky, it is automatically hauled up to the boat. Sticky must then surface in order to obtain a new length of rope.

When ten gold bars have been safely landed, you move to the next level where the going gets rougher. A buzzing helicopter drops bombs, seabed-Sticky missiles proliferate, force-fields crackle and monster crabs come out for a quick chomp on a sea captain.

Complete the eight levels, and they cycle round again but faster. You can start on any level. Control is by joystick only, with a two-player game option.

Verdict

Colourful graphics with plenty of action and bags of sound effects (loved the theme tune) make this an enjoyable game. Never mind the potty bubble gum motif — have some bubbly fun.

Bob Chappell

RATING (/5)

Lasting appeal

Playability

Use of machine

Overall value



Target 6502

Name Flak System Atari 48K (800, XL, 1200) **Price** £12.95 **Publisher** Funsoft (Centresoft, Midlands) 021-520 7591 **Format** Disk **Language** Machine code **Other versions** Commodore 64 **Outlets** Retail

The universe is under threat again, folks, but the action is taking place low over what looks like good old Mother Earth. And not an alien in sight.

Objectives

As pilot of a fighter plane, you must fly low over a wide expanse of enemy territory, destroying their emplacements with your air-to-ground cannon.

Though you never see the enemy, they hit back with barrages from their many flak batteries, the fire getting more vicious the further you progress into the heart of their stronghold.

Your ultimate mission is to reach and destroy Computer Control, the enemy HQ.

In play

From your birds-eye view of the ground, what you see first is four of your green and white striped fighter planes sitting beside a short runway. One automatically moves smartly to the left and jets swiftly into battle.

A cross-sight sits permanently a small distance before the nose of your craft, both moving in unison. To shoot an enemy battery, the cross-sight must sit precisely over the target when your repeat-fire cannon is triggered.

As your craft moves around the screen, the Panorama is smoothly and steadily scrolling downwards. The first sweep of scenery comprises roads, trees and fields. Among these are rectangular and triangular batteries from which the flak pours forth.

A variety of batteries require destruction. Some have doors which even open and close, and can only be destroyed when gaping wide. Some are flat-roofed buildings, the only way to knock these out is to determine the exact source of fire. Others are hexagonal clusters or form conglomerations.

HQ itself resembles a large-scale computer motherboard, full of batteries designed like chips. At the heart of this is a chip clearly labelled 6502 — your main target.

When a plane is hit, the next zooms along the runway and flies at high-speed directly to where the previous one was destroyed. Seeing the terrain scrolling away at a rate of knots when this happens is most impressive. Once all your planes are knocked out, it's back to the beginning.

There are two-player and two skill level options. Sound, colour and graphics are of a high standard.

Verdict

This is several notches above most shoot-em-ups in terms of originality. It is well implemented and is both exciting and addictive.

Bob Chappell

RATING (/5)

Lasting Appeal

Playability

Use of Machine

Overall Value



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VAMPIRES



The object in 'Vampires' by Mark Charlton of Ashford, Kent, is to uncover the vampire gold hidden under a tomb in an enclosed graveyard. To reach the graveyard you wend your way through the surrounding maze collecting the dots placed evenly along the maze floor (these will score you points) and other objects: crosses, arrows and keys. The keys will open a door to a small room.

In your travels you come across a magic

dot which opens the gate to the graveyard. You must hurry to the open gate taking care not to bump into any of the maze walls which are electrified. Once in the graveyard you have only to reach the tomb and the vampire treasure will be revealed to you.

Your main adversary is time, as you have a limit of 300 moves, though the electric walls, neutraliser walls, and protection doors are also a great hazard.

Full instructions are included in the game. Movement is by keyboard only, using the z and x keys for left and right and k and m for up and down. A button has been included which changes the paper colour, though the original red and black seem to create the right atmosphere for a vampire haunt. The colour can be resumed by pressing another key.

There is also a quit button if the going gets too tough.

```
1 POKE618,10:CLS:PAPER1:INK0
10 FORN=0T0127
20 READX:POKE46080+(97*8)+N,X:NEXTN
30 DATA63,33,18,12,12,18,33,63,33,63,51,
45,45,51,63,33
40 DATA63,33,50,44,44,50,33,63,63,33,19,
13,13,19,33,63
50 DATA63,63,63,63,63,63,63,12,18,12,
8,8,14,8,14
60 DATA0,0,0,12,12,0,0,0,4,14,21,12,4,6,
5,4
70 DATA33,63,33,33,63,33,33,63,12,12,12,
63,63,12,12,12
80 DATA4,10,17,21,31,21,21,31,12,30,63,4
5,63,51,63,63
90 DATA12,12,30,30,12,12,12,12,0,0,0,12,
12,0,0,0
100 DATA0,0,0,12,12,0,0,0,0,0,0,12,12,0,
0,0
200 CLS:PAPER2:INK0
210 PLOT5,10,"DO YOU WANT THE INSTRUCTIO
NS":GETA$
220 IFA$="Y"THENPING:CLS:GOTO300
230 IFA$="N"THENPING:CLS:GOTO990
240 IFA$<>"Y"ORAF$<>"N"THENGOTO210
300 PAPER0:INK3:PLOT15,0,"VAMPIRES":PLOT
14,0,CHR$(2):PLOT15,1,"****
****"
301 PLOT14,1,CHR$(1)
310 PLOT1,4,"THE VAMPIRES TREASURE HAS
BEEN LOST"
315 PLOT1,6,"FOR YEARS.YOUR TASK IS TO S
```

```
TEER THE"
320 PLOT1,8,"HUNTER (1) AROUND THE MAZE
COLLECTING"
330 PLOT1,10,"THE GIFTS.THESE CONSIST OF
KEYS,ARROWS"
340 PLOT1,12,"CROSSES AND DOTS.THE KEY O
PENS UP THE"
350 PLOT1,14,"DOOR TO THE SMALL ROOM."
360 PLOT1,16,"TO ENTER THE GRAVEYARD YO
U MUST FIND"
370 PLOT1,18,"A MAGIC DOT WHICH WILL OPE
N THE GATE."
380 PLOT1,20,"ONCE YOU HAVE FOUND IT QUI
CKLY RUSH TO"
390 PLOT1,22,"THE GRAVEYARD AND HIT A TO
MB.YOU HAVE"
400 PLOT1,24,"A TIME LIMIT OF 30~ SO BE
QUICK!!!!!!"
410 PLOT7,26,"PRESS ANY KEY TO CONTINUE"
:GETA$
550 IFA$=" "THENGOTO540
560 IFA$<>" "THENCLS
570 PRINTCHR$(12)
580 PRINTCHR$(4):CHR$(27):"J
VAMPIRES
581 PRINTCHR$(4)
590 PLOT12,8,"KEYS FOR MOVEMENT":PLOT11,
8,CHR$(2)
600 PLOT12,10,"LEFT-Z RIGHT-X":PLOT9,
10,CHR$(1)
610 PLOT12,12,"UP-K DOWN-M":PLOT11
,12,CHR$(3)
```



Title: *Vampires*
Machine: *Oric 1*
Language: *Oric Basic*
Application: *Game*
Author: *Mark Charlton*

1	Disable keyclick and set paper and ink colours	1020-1290	Produce maze		and move man accordingly
10-100	Redefine part of the lower case character set	1298	Plot magic dot		
200-660	Print instructions	1301	Plot man	1390	You have hit an electric wall
990	Define variables	1305	Set up timer		
1000-1010	Plot outer perimeter of maze	1310-1315	Put score board at the top of the screen	1400	You have hit a neutraliser wall
1000-1012	Coordinates for magic dot	1330	Clear man from z,x position	1405-1410	Collect key which opens door to small room
		1340-1382	Look for keys pressed	1420	Collect dot

```

620 PLOT18,14,"QUIT-Q":PLOT17,14,CHR$(6)
630 PLOT16,16,"HOLD ON-H":PLOT15,16,CHR$(5):PLOT16,18,"HOLD OFF-J"
631 PLOT15,18,CHR$(7)
640 PLOT7,26,"PRESS ANY KEY TO CONTINUE"
:PLOT6,26,CHR$(4):GETA$
650 IFA$="THENGOTO640
660 IFA$<>" THENCLS
990 T=0:S=0:Z=31:X=23:O=0
1000 INK1:PAPER0:FORN=2TO35:PLOTN,2,"a":PLOTN,24,"a":NEXTN
1010 FORM=3TO23:PLOT1,M,"b":PLOT36,M,"b":NEXTM
1011 C=INT(RND(1)*33)+2
1012 D=INT(RND(1)*8)+16
1020 PLOT1,2,"c":PLOT1,24,"c":PLOT36,2,"d":PLOT36,24,"d"
1021 PLOT1,25,"eeeeeeeeeeeeee VAMPIRES ee
eeeeeeeeeeee":PLOT0,25,CHR$(3)
1022 PLOT1,26,"eeeeeeeeeeeeee eeeeeeeeeee
eeeeeeeeeeee":PLOT0,26,CHR$(3)
1100 PLOT2,3,"jgggggggggggggggggggggggggggg
eeegggg"
1110 PLOT2,4,"geeeeeeggggeeeeggeeghgfgge
gggggeeg"
1120 PLOT2,5,"gggggfegeeeeeeggggggggggggg
gggeeg"
1130 PLOT2,6,"gggggggeennnnnegggggeeeeeee
geeeeg"
1140 PLOT2,7,"geeegeennnnnegeeggggggggg

```

```

gggeeg"
1150 PLOT2,8,"geeggegeeeieeggggeeeeee
eegeeg"
1160 PLOT2,9,"gegegeeggggggggggggggggggg
gggggg"
1170 PLOT2,10,"gggggggggggggggggggggggggg
eeggeeg"
1180 PLOT2,11,"gegeeeheggggmmmmmmmmgggg
gggeeg"
1190 PLOT2,12,"geeeeeeggggggggggggggggggg
eeegheg"
1195 PLOT2,13,"gegeeeeggggggggggggggggggg
eeggeeg"
1200 PLOT2,14,"gggggggghgggggggggggggggggg
egggggf"
1210 PLOT2,15,"gggggggeeggggggggggggggggg
gggeeg"
1220 PLOT2,16,"gggeeeeggggggggggggggggggg
eggeeg"
1230 PLOT2,17,"gggggggggggggggggggggggggg
gggggggg"
1240 PLOT2,18,"gegeeeeggeeeeggeeggggeeee
eeggeeg"
1250 PLOT2,19,"gggggggggggggggggggggggggg
eeggeeg"
1260 PLOT2,20,"gegeeeeggeeggeeggeeggggg
gggggggg"
1270 PLOT2,21,"gegegefgegeeeeggggghegge
geeeeg"
1280 PLOT2,22,"gegeeeeggggggggggggggggggg
gegeeg"
1290 PLOT2,23,"jgggggggeeggggggggggggggg

```




1430	Collect an object	60000-60060	Print scores after hitting electric wall
1440	You have hit a protection door	60099-60160	Print scores after hitting neutraliser wall
1450	Collect object	60200-60270	You have run out of time
1460	Hit magic dot which opens gate to graveyard	60300-60390	Print scores after hitting protection door
1470	Reached tomb and collected gold	60400-60470	You have pressed the quit button
1480	You have hit an electric wall	60500-63100	You have collected the vampire gold, plots scores
1490	Collect object		
1500	Close gate		

PCN

```

999999999"
1298 PLOT C,D,"p"
1299 PAPER0
1301 PLOT Z,X,"1"
1305 T=T+1
1310 PLOT1,0,"SCORE"+STR$(S):PLOT29,0,"T
IME"+STR$(T):PLOT28,0,CHR$(
3)
1315 PLOT10,1,"ITEMS COLLECTED"+STR$(0):
PLOT9,1,CHR$(2)
1330 PLOT Z,X," "
1340 K=KEY$
1345 IF T=300 THEN GOTO 60200
1350 IF K$="Z" THEN LET Z=1
1360 IF K$="X" THEN LET Z=1
1370 IF K$="K" THEN LET X=X-1
1380 IF K$="M" THEN LET X=X+1
1381 IF K$="H" THEN GOTO 63099
1382 IF K$="0" THEN GOTO 60400
1385 Y=SCRN(Z,X)
1390 IF Y=9709Y=98 THEN ZAP:GOTO 60000
1400 IF Y=101 THEN ZAP:GOTO 60099
1405 IF Y=102 THEN O=O+1
1410 IF Y=102 THEN PLAY1,2,3,4:WAIT5:PLAY0,
0,0,0:PLOT13,8,"p":S=S+20
1420 IF Y=103 THEN PLAY1,2,3,1:WAIT5:PLAY0,
0,0,0:S=S+1
1430 IF Y=104 THEN PLAY1,4,1,9:WAIT5:PLAY0,
0,0,0:S=S+10:O=O+1
1440 IF Y=105 THEN EXPLODE:GOTO 60300
1450 IF Y=106 THEN PLAY1,4,2,10:WAIT5:PLAY0,
0,0,0:S=S+15:O=O+1
1460 IF Y=112 THEN PLAY1,7,3,4:WAIT5:PLAY0,
0,0,0:PLOT18,11,"nnn":S=S+1
1470 IF Y=107 THEN ZAP:S=S+100:GOTO 60500
1480 IF Y=109 THEN ZAP:GOTO 60000
1490 IF Y=110 THEN PLAY1,4,5,2:WAIT5:PLAY0,
0,0,0:S=S+30
1500 IF Y=111 THEN PLAY1,3,6,4:WAIT5:PLAY0,
0,0,0:S=S+10:PLOT18,11,"iii
"
1510 GOTO 1301
59999 END
60000 CLS:PAPER0:INK2
60005 PLOT10,0,"YOUR SCORE WAS"+STR$(S)
60010 PLOT10,8,"ITEMS COLLECTED"+STR$(0)
60020 PLOT12,11,"YOU LASTED"+STR$(T)
60025 PLOT6,14,"YOU HIT AN ELECTRIC WALL
"
60030 PLOT7,26,"DO YOU WANT ANOTHER GO":
GETA$
60040 IFA$="Y" THEN GOTO 200
60050 IFA$="N" THEN CLS:END
60060 IFA$<>"Y" OR A$<>"N" THEN GOTO 60030
60099 CLS:PAPER7:INK0
60100 PLOT10,0,"YOUR SCORE WAS"+STR$(S):
PLOT24,0,CHR$(0)
60110 PLOT10,8,"ITEMS COLLECTED"+STR$(0)
60120 PLOT25,8,CHR$(0)
60130 PLOT7,26,"DO YOU WANT ANOTHER GO":
PLOT12,11,CHR$(7)
60140 PLOT6,14,"YOU HIT A NEUTRALISER WA
LL"

```

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60130 PLOT7,26,"DO YOU WANT ANOTHER GO":
GETA$
60140 IFA$="Y" THEN GOTO 200
60150 IFA$="N" THEN CLS:END
60160 IFA$<>"Y" OR A$<>"N" THEN GOTO 60130
60200 CLS:PAPER3:INK0:PLOT10,0,"YOUR SCO
RE WAS"+STR$(S):PLOT24,0,CH
R$(0)
60210 PLOT10,8,"ITEMS COLLECTED"+STR$(0)
:PLOT25,8,CHR$(0)
60230 PLOT9,14,"YOU RUN OUT OF TIME":PLOT
T28,14,CHR$(0)
60240 PLOT7,26,"DO YOU WANT ANOTHER GO":
GETA$
60250 IFA$="Y" THEN GOTO 200
60260 IFA$="N" THEN CLS:END
60270 IFA$<>"Y" OR A$<>"N" THEN GOTO 60240
60300 CLS:PAPER1:INK7
60310 PLOT10,0,"YOUR SCORE WAS"+STR$(S):
PLOT24,0,CHR$(7)
60320 PLOT10,8,"ITEMS COLLECTED"+STR$(0)
:PLOT25,8,CHR$(7)
60340 PLOT6,14,"YOU HIT A PROTECTION DOO
R"
60350 PLOT12,11,"YOU LASTED"+STR$(T):PLOT
T22,11,CHR$(7)
60360 PLOT7,26,"DO YOU WANT ANOTHER GO":
GETA$
60370 IFA$="Y" THEN 200
60380 IFA$="N" THEN CLS:END
60390 IFA$<>"Y" OR A$<>"N" THEN GOTO 60360
60400 CLS:PAPER4:INK7:PLOT10,0,"YOUR SCO
RE WAS"+STR$(S):PLOT24,0,CH
R$(7)
60410 PLOT10,8,"ITEMS COLLECTED"+STR$(0)
:PLOT25,8,CHR$(7)
60420 PLOT6,14,"YOU PRESSED THE QUIT BUT
TON"
60430 PLOT12,11,"YOU LASTED"+STR$(T):PLOT
T22,11,CHR$(7)
60440 PLOT7,26,"DO YOU WANT ANOTHER GO":
GETA$
60450 IFA$="Y" THEN GOTO 200
60460 IFA$="N" THEN CLS:END
60470 IFA$<>"Y" OR A$<>"N" THEN GOTO 60440
60500 CLS:PAPER5:INK0:PLOT10,0,"YOUR SCO
RE WAS"+STR$(S):PLOT24,0,CH
R$(0)
60510 PLOT10,8,"ITEMS COLLECTED"+STR$(0)
:PLOT25,8,CHR$(0)
60520 PLOT4,11,"YOU COLLECTED THE VAMPIR
ES GOLD"
60530 PLOT12,14,"IN A TIME OF"+STR$(T):PLOT
24,14,CHR$(0)
60540 PLOT7,26,"DO YOU WANT TO PLAY AGAI
N":GETA$
60550 IFA$="Y" THEN GOTO 200
60560 IFA$="N" THEN CLS:END
60570 IFA$<>"Y" OR A$<>"N" THEN GOTO 60540
63099 FOR N=0 TO 7:PAPER N:K$=KEY$:IF K$="J" T
HEN GOTO 1299 ELSE 63100
63100 WAIT80:NEXT N:GOTO 63099

```

Newbrain AD. Both manuals, software technical manual, Newbrain Dissected, 2 cassette leads, 2 printer leads. £200. Tel: Al. Orington (0689) 31183.

48K Spectrum, 2 months old, + DTKronics keyboard, + cassette recorder + software, all originals, + lots of magazines, worth £250 sell for £200. Tel: Harlow (0729) 20945. Buyer collects.

Electron software wanted. Send your list to: B. Elliott, 2 Station House, Neilston Rd, Paisley, PA2 6QB, Renfrewshire.

BBC Teletext adaptor, R1850.0. Cumana full height 100K disk drive + psu including manual, cable, format disk, £165.00. Excellent condition. Tel: 01-585 2449.

BBC B with Acorn speech synthesiser, tape recorder and lead manuals and software worth £210. OS, £380.00. Tel: Stroud 04356 2910.

Exchange my Ixt 500 synthesiser which cost £220, for a Sinclair Spectrum 48K plus tape machine. Tel: Aldridge 0922 54482.

Vi20 + cassette deck, joystick, books, popular games, most + a machine code monitor. Will accept £100.00. Tel: 0204 792396 after 6pm.

Computer tapes, various lengths, surplus to requirements £2 for six. Also back issues PCN, 20p each plus postage. State requirements. 33 Haughsham Road, Halifax.

Dragon 32, 2 joysticks, loads of software: utilities, games etc. All originals, + user magazines. New, nearly £400. Bargain £185.00. Excellent condition. Tel: Twyford 29973 after 4.45pm.

Lynx 48K + games, as new, £130.00. Tel: Northampton (0604) 717328.

Spac Cassette MT 65 Electronic keyboard for Spectrum 48K computer and games if any. Tel: Frome 61870.

Newbrain A Cassette printer, lead, w/p, disassembled, Spacchase, Othello, 6 tapes. Manual Newbrain Dissected Getting Best From Newbrain, £175.00. Tel: Leighton Buzzard (0525) 377910.

Memotech 500 37990 original packing, manual, demo tapes, unwanted gift, worth £275, offers around £225. Tel: Leighton Buzzard (0525) 377910.

Dragon 32, joysticks, software inc. Donkey King and Allkread. Maps and books. Worth £330, will sell for £120.00. Tel: Twyford (Berks) 340037 after 5.30pm.

Electron H185 one month old, also OriC 148K plus 12 tapes and 4 books, £110, or the lot £280. Tel: 041-941 1219, ask for Kenny.

Wanted, printer, letter quality or near letter quality, for my Atari. Also disk reader. Tel: 01-570 3690.

Sharp PC 1211 plus CE 122 plus, CE 121 plus instructions, £120. Commodore printer 1023, £100. Tel: 0505 842406.

TandyGCP 1154-colour printer plus paper and pens, £100. Contact Dawson-Taylor 0329 663611.

BBC B, disk interface, extension board, Cumana disk drive, Wordwise, other extras, 2 months old. Immaculate, £700 complete, may split. Tel: Norwich 872209.

Atari hardware/software wanted, Epson RX80 F/T, Atari-writer, Boulder Dash, full, 1020-colour printer, cartridges & disks, including assembler editor, swap (P). Tel: 021-472 5662.

Bargain! 128K Apple IIe VDU, 2 disk drives Epson MX 100 £280 each, joystick, TV modulator, Base II, Multiplan Wizardry and more £2,000.00. Tel: 0279 37425 after 7.30pm.

Interface 1 with two Microdrives and four cartridges £110.00. Tel: Hinton 50779.

Genie 1 + 32K interface, monitor, hi-res graphics unit, books, software including word processor, editor assembler etc. Tel: Alan Donaldson on 0592 758746 after 6pm.

Expansion Box, 32K RAM for TI99/4A, £150. Logo £50, mini memory £40, some games modules, offers to 061-432 0562.

MSX 100 20K with Peals spreadsheet, £450. GCL M5 as new £60. Microline 82A 120 cps printer £100. Tel: 0734 594755.

48K Spectrum, ZX printer, prism VTX 5000, Kempston joystick, carrying case, £240. Tel: 01-504 4201 after 7pm.

CDM-64, 1541, GP 100-VC disks, PRG, Assembler Tutor, utilities, Floppiers, books, High Flyer, £470.00. 061-330 8514.

Disk 4 Tech Cx50A single cased with 40 track 5 1/4, sis 100K. £100.00. Tel: 02814 3286.

Lynx 48K still under guarantee, hardly used. Boxed and gathering dust, give away for only £99. Tel: 01-337 2694 (Westminster Park).

Spectrum 48K, interface + 2, Microdrive, 2 cartridges, SLR rifle, Fuller DS keyboard, printer, robotics case, cassette, software worth £200+, many books + magazines. Will sell for £300.00. Tel: Nigel (021) 544 6518.

Printer, Star DP510, full featured dot matrix, centronics interface, little used £170. Spectrum ZX printer centronics printer interface plus cable £30. Tel: Maidenhead (0628) 29099.

48K Spectrum, Interface 11, tape recorder, DTKronics, keyboard, £215 of software. Including White Lightning, Hobbit, Sabre Wulf, Fort, Psyrton Games Designer, 3 Imagines. Worth over £400, sell £295.00. Tel: 884559 Gt. Harwood, Nr. Blackburn, Lancs.

Memotech MTX500, boxed, as new. Only 3 months old, 3 games, £220. Tel: Phil, Rm 22, Flat 3, Manchester 061-273 3844. BBC wanted.

Vi-20 + disk drive mother-board, cassette, 3k mem m/c cart, lots of software £300. Tel: 070 73 35737.

Galaxy 64K CP/M computer, 400K disk drive, hard disk interface, monitor, software £700—Bath 20150 for full details.

TIS 80 Model 1 48K, lower case, twin disks, double density, lots of software, business and pleasure. Ideal for small business £450.00. Tel: Norwich (0603) 660596.

Newbrain AD manuals demo. Tapes and software £170. Sanyo green monitor 12", £75, or £220 the lot. Delivery negotiable. Tel: Fischer, Wores (0905) 620098.

Sharp MZ-80K integrated screen and cassette. To Spectrum includes extended Basic and games. Two manuals, £200. Tel: Bury St. Edmunds (0284) 66219, after 5pm.

48K Spectrum under warranty, hardly used, plus £300 best software and joystick with interface, + small speaker. £200 secures all. Tel: 01-570 5042 eves + wknds.

For sale, 60 copies PCN £10. Tel: Lincoln (0522) 750232.

Sharp MZ80A, 48K, software package, includes games, Chess game. Hardly used, still boxed, as new. Offers. Tel: 01-500 5016.

Sharp MZ80K with built-in monitor and cassette recorder 48K plus software and manuals, £225. Tel: Runcorn (09285) 69605.

48K Spectrum, under guarantee, joystick, interface, recorder, printer, £300 + software (big names), plus books and bags. Worth £600—accept £350.00. Tel: Yeovil 28353.

Sord MS + Basic G + Falc, five months old £160. Tel: Bath (0202) 832668.

Dragon 32, joysticks, cassette, software worth £200+ and books. All worth £500+. Excellent condition, still boxed, as new, £250.00. Tel: Dartford 334769.

PET 16K CDM 4016, hardly used + cassette recorder + programs and manuals, £395.00. Clacton (0255) 860231 after 7pm or anytime Sunday.

Vi20, C2N, super expander, 16K, cartridges, adventures, and £70 worth of games, Maplin voice synthesizer, and lots more £140.00. Tel: 0934 510842.

Vi20, Starter pack, switchable 16K RAM, super-expander, tapes, nine cartridge games, beginners assembly, many books, mag. £250.00. Tel: 01-732 1918 eves.

BBC B1,20S, 09DFS, Wordwise, Disk of Doctor, volume control, joysticks, programs £420. Dual (ZX100K) disk drive and disks £260. Tel: Finty (036) 086 279 after 7pm.

Intellivision with 6 cartridges, Worth approx £220. Giveaway price £150. Write 95 Seely Rd. Tooting, London SW17. Tel: 01-677 9213 weekdays after 4.30.

Vi20 - C2N cassette + joystick, two games £90. Tel: 0244 570878 (Chester).

Commodore 64K, plus cassette, C2N with the same software, £200.00. Tel: 01-574 9383 after 6.

Epson HX20 with 16K expansion and tape drive software and HX300 books with cassette case £450. Tel: Wells (0246) 508 435 Chesterfield after 7pm.

Osborne, 2x200K basic software plus dbaseII, financial, all w/p, graphics, games £420. Tel: 0272-567916 (Bristol).

Vi20 16K switchable RAM data recorder joystick 10 cass. 5 cartridges + manuals + books £150.00. Tel: 01-789 2098 after 6pm.

Atari 400 32K excellent condition boxed includes Basic cartridges. Games also available £105. Tel: Reading (0734) 869259 eves.

Business system: Commodore 8032 computer, 8050 disk-drive, Also Wordcraft 80, Visicalc, 022 (database) software cost over £3000, little used. Best offer £1100. Tel: 0272-567916 (Bristol).

Sanyo colour monitor (3125N). Like new, set up for BBC B. First reasonable offer secures. Also BBC business software games £200, 8K, integral cassette, screen, sw.

Lynx Laureate 128K twin disk drives, Perfect range of business software, Cost £1000. Only £650.00. Tel: 0970 828851.

PET 2008, 8K, integral cassette, screen, small keyboard, Microchess, Basic Tutor cassettes. £150. Tel: 0268 691663.

Sharp MZ-80A with PS printer expansion box interface card and cable, paper and software v/c, 13 months old, £450.00. Tel: Maidenhead 32875.

Microdeal joystick (pair) for BBC £15 (switched). Hardly used BBC software must also go. Send sac or. Tel: 0788 812940 after 7pm except Thurs.

Lynx 48K as new, little used, guaranteed 2 months, leads, manual, intro cassette, games cassette, 2 user magazines, boxed £150. Tel: 0704 893053.

Atari 1020 4 colour printer with video graphic and printer programs £120. 410 tape recorder £20. Tel: Dudley 55875.

Commodore 8032 SC computer and 3040 disk drive with useful software £750.00. Also 3040 disk wheel printer £300.00. Teletype ASR35 £50. Tel: 01-451 0520.

BBC B 1.20S EPROM monitor and toolkit, books games etc. £325.00. Tel: 01-229 0350 Tu, Th, 9 till 5.

Atari clear-out, 1020 colour printer, cartridges: Jumbojet Pilot, Mountain King, Serpentine, Pole Position, Asteroids, wheel printer complete, disks: Archon, Up & Away, offers, disks: 021-472 5662.

BBC Micro (32K Model B) with graphics ROM, will swap for Commodore 64 with £541 disk drive. Will have over cash adjustments. Tel: Bulford Camp 8865.

Commodore 64 with disk drive and C2N cassette recorder, also magazines and books, worth over £450, sell for £250. Tel: 01-642 6553.

Atari cartridges for sale: Star Raiders, Submarine Commander, £12, or swap for other Atari games. Tel: Yateley 87119.

TRS-D0 120 dot matrix printer, latest model, unused, unwrapped gift, Boxed. Tel: Dawlish (0626) 862455.

Z801 16K Dean electronics keyboard, book, software including assembler and compiler, bargain at £45. Tel: Buckfast-leigh (03644) 3229 ask for Myles.

Atari 48K plus over £100 worth of software ep Zorgons Revenge, Super Meteors, Hobbit, still under guarantee. £150. Tel: (0742) 550125.

BBC Acornsoft kit. Brand new £75. Acornsoft BCP package comprising ROM, disk and manual, as new, £65.00. Prism Acoustic modem £50.00. Tel: Canterbury 750600.

For sale for the Dragon 32, Donkey King, Android Attack, Computo voice for the OriC1, Multigames1, Xenon1, £4 each. Tel: 01-291 1207 after 5pm. All originals.

MZ-80K, MZ-80FB double disk, MZ-8010 box disk and centronics interface cards cables etc. Software and books. Little £200. £775 one will split. Tel: 0698-747831.

Commodore Vic 1515 graphic printer for Vic 20 computer, £125. Tel: Peterborough (0733) 78541 (evenings).

MATTEL Intellivision, 7 cassettes, Tron, Hockey Star, Strike and four other well known cassettes. Sell for £120. Tel: 063165. Convey, evenings.

SPECTRUM SOFTWARE WANTED Maker's originals with cassette slips. All types. Cash for large collections. Will collect. London area. Full details first. Tel: (01) 520 0904.

FOR SALE 'Brother' EP-22 typewriter/printer. Only two months old, still in guarantee, £155.00. Tel: Medford (0611) 941 3102.

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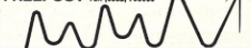
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Copies of Issues 1 to 12 are still available from our Back Issues Department (see order form on next page). For details of their contents please call Gina Setchfield on 01-439 4242.

Issue 13, June 3-9.
Pro-Tests: Teletext for Dragon 32, Aberforth Forth for Spectrum, GFS graphics processing system for Apple II+ joystick, rulers, AJL. Features: Dragon meets Tandy, Oric music part 2, transferring Basic for Colour Genie and Genie II.

Gameplay: Everest Ascend (Spectrum), Colour Genie roundup, Micro Maze (Jupiter Ace), Oric (Atari).
Programs: Cupid (Oric), Alien (Dragon 32), Time Bomb (Atari).

Databases: peripherals.
Issue 14, June 10-15.
Pro-Tests: Apple Accelerator II board, Modula-2 (Apple II), Oric Basic, Joystick Control Unit J6, Kempston Centronics Interface, BBC Speech Synthesizer.

Gameplay: Newbrain Basic part 1, Sirius designing.
Gameplay: All Diddums (Spectrum), Monopole (Commodore 64), Automonopoli (Spectrum), Dragon dramas.
Programs: Time Bomb (Atari), Sheep Drive (BBC).

Databases: Software.
Micropaedia: Spectrum, part 1

Issue 15, June 16-22.
Pro-Test: Comix 35, Address Manager (Spectrum), Syntex (Commodore 64), MST Database (Epson HX-20), Voice Input Module (Apple II).

Gameplay: Newbrain Basic part 2, Game scene.
Gameplay: Cleared for Landing, Playing the Ace (Apple II), Vultures, Star Jannet (Dragon 32).

Programs: Mover (BBC II), Sprite Clock (Commodore 64), Pirate Island (Atari, 3 to 9), Micro-mind (Colour Genie), Brickbat (Dragon 32).

Databases: Hardware.
Micropaedia: Spectrum, part 2.

Issue 16, June 23-29.
Pro-Test: Atari v Acorn, word processing for the Commodore 64, Simpliflex (CP/M), MFF-11 printer, Z80 Pack for BBC.

Features: ZX81 Maths, US mail order, Atari graphics.
Gameplay: Computer Scramble (Spectrum), Education (BBC), Horace and Spiders (Spectrum), Catcha Snatcha (Vic 20).

Programs: Video
T1994A, 3 to 6, Bowling (Spectrum), Pirate Island (Atari) con.

Micropaedia: Spectrum, part 3.

Issue 17, July 3-9.
Pro-Tests: Due-16, The Organizer (CP/M), Trace and Test (Spectrum), Juki 6100 daisywheel, Videx Ultra Term (Atari II).

Features: Leaving part 1, Atari screen action.

Programs: Video
T1994A, con, Pirate Island (Atari) con, Word processor (BBC).

Micropaedia: Sound, part 1.

Issue 18, July 10-13.
Pro-Tests: Tandy 10, RS232 interface (ZX81), ROM pager (Commodore), Interface printer buffer, IBM Personal Basic, Spectrum assembler, Newbrain WP.

Features: Leaving part 2, Lynx music.
Gameplay: Spectrum Backgammon, BBC Snooker, Commodore 64 roundup, Serpentine (Vic 20), Post (Spectrum), Spectrum Safari.

Programs: Word Processor (BBC), Fruit Machine (Spectrum), Micropaedia: Sound part 2.

Issue 19, July 14-20.
Pro-Tests: 16-bit chips, Stock control (Epson HX20), Malpuss (Tandy), Smith Corona, day-wheel, ZX81 word processing.

Features: Insurance, buying second-hand.
Gameplay: Escape MCP (64), Escape from Perilous (Atari), Apple round-up, Temple of Apathi (64), Airline (Spectrum), Heathrow (Spectrum).

Programs: Colour Code (Atari), Wreck (Dragon).
Micropaedia: Sound, part 3.

Issue 20, July 21-27.
Pro-Tests: Tape bareboard, Vic digital rule, Sekolha colour printer, Toolkit (Spectrum), Bonus (Pet payroll), Newbrain monitor.

Features: Computer art, Dragon scrolling.
Gameplay: Rabbit Trail (T1994A), Challenge (Atari, Vic 20, T1994A), BBC roundup, Joist (Spectrum), Molar Maul (Spectrum), Print Shop (Spectrum), Time Lords (BBC).

Programs: Tumbler (Oric), Hummer House of Horror (Spectrum), Jumpman (64), Jumping Jack (Spectrum), Fourth Encounter (Vic), Cyclons (64).

Programs: Collection (Vic), Bomber (64), Defender (BBC).
Micropaedia: Sound, part 5.

Issue 22, August 4-10.
Pro-Tests: Spectrum Forth, BBC graphics, Music synthesizers, IBM plotter, Brother daisywheel, Maltron keyboard, Apple.

Features: Gemie assembler, Dragon machine code.
Gameplay: River Rescue, Oric Attack (Atari), Zork (64), Knot in 3D, 3D Combat Zone (Spectrum), Moria (Oric), Velmor's Lair (Spectrum).

Micropaedia: CP/M part 1.

Issue 23, August 11-17.
Pro-Tests: Sort Basic 6, Tandyword, BBC microfloppies, Microdrive, Tandy Model 4.

Features: Dragon machine code, Atari controllers.

Gameplay: Bridge Master, Sysv, Manic Miner (Spectrum), Atari roundup, Candy Floss/Hangman (Oric), Everest (Dragon).

Micropaedia: CP/M, part 2.

Issue 24, August 18-24.
Pro-Tests: T-Maker III, Spectrum Fifth, daisywheels surveyed, Spectrum digital tracer, Laser.

Features: Videotex, Dragon machine code.
Gameplay: Oric roundup, Cookie, Egg Farm, Xadom (Spectrum), Sea Lord (BBC), Lantianic (Dragon), The Island (64).

Micropaedia: Commodore 64, part 1.

Issue 25, August 25-31.
Pro-Tests: Electron, Simons Basic, Oric monitors, Microdrive.

Features: Newbrain map, Acorn Atom, Dragon machine code.
Gameplay: Suspended (64), Terror Dakiks, Franz AM (Spectrum), Dragon roundup, Jogger (Oric), Frogger (IBM).

Micropaedia: Commodore 64.

Issue 26, September 1-7.
Pro-Tests: Microtran 65, BCPL, BBC tracer, 80 column Pet, Oric interfaces.

Features: Magic Mountain, Smugglers Cove (Spectrum), Spectrum roundup, Matrix (64), Ninja Warriors (CP/M), Dallas, (Oric), Call to Arms (IBM).

Micropaedia: Commodore 64.

Issue 27, September 8-September 14.
Pro-Tests: Sharp MZ700, BBC Lisp, Apple editor, IBM mic, ZX81 surgery.

Gameplay: Zip-Zap, Zzoom (Spectrum), Spectrum roundup, Hover Bover, Benji-Space Rescue (64).
Micropaedia: Dragon, part 1.

Issue 28, September 15-September 21.
Pro-Tests: Zenith Z100, Sail Logo, Atari Supergraphics, Newbrain CP/M, IBM mic.

Gameplay: The Witness, Super Scramble, Slix (64), Harrier Attack (Oric), Morocco Grand Prix (Dragon), Pharaoh's Tomb (Spectrum).
Micropaedia: Dragon, part 2.

Issue 29, September 22-September 28.
Pro-Tests: Portico Miracle, Dragon editor, BBC light pen.

Features: HX20 disassembles, T1 transformations.

Gameplay: Gridder, Gloopert, California Gold Rush (64), Oric roundup, Bomb Alley (BBC), Spitz, General Election (Spectrum).

Micropaedia: Dragon, part 3.

Issue 30, September 29-October 5.

Pro-Tests: NEC's Advanced Personal Computer, Financial Planner (IBM), Kongman's a.b.c. Countabout Hot Box Spooter (Spectrum), Prison VTX500, Extended Basic (Dragon).

Features: Spectrum machine code, Gameplay: Halo of Death/Sword of Forlorn (64), 747 Flight Simulator (BBC), Dragonfly (Dragon 32), Forensic: Note Invaders (BBC).

Programs: Search (ZX81), Composer (Oric).

Databases: Hardware.
Micropaedia: Everything you wanted to know about programming, part 1.

Clubnet: Clubs.

Issue 31, October 6-October 12.
Pro-Tests: Atari 600XL, Condor Series 20 (IBM), Accus Non-volatile Diary/Filing system (BBC), ROM extension board (BBC).

Features: Oric sound routines.
Gameplay: Greedy Gulch (Spectrum), Kong (Spectrum), Crazy Kong (64), Cuthbert Goes Walkabout Movie Producer (Dragon).

Programs: Composer (Oric), 555 (Spectrum), Anagrams (Dragon).
Databases: Peripherals.
Micropaedia: Everything you wanted to know about programming, Clubnet: User Groups.

Issue 32, October 13-October 19.
Pro-Tests: Mattel Computer Adapter (Intellivision), Sprite-Gen (BBC), Typing Strategy (Apple), MCode (Spectrum), Cirtex Eronom Programmer (Apple).

Features: Teletext options, Inside the Genie.
Gameplay: Space Shuttle Frogger (Dragon 32), Atari roundup, Spectradex 2/Football Pools Program (Spectrum).

Databases: Software.

Clubnet: Clubs.
Programs: Bees Away (BBC), Composer (Oric).

Micropaedia: Everything you wanted to know about programming, part 3.

Issue 34, October 27-November 2.
Pro-Tests: NEC's PC-8201A, Simply File (64), The Forest (Spectrum), Amcom DFS (BBC), Currah Microspeech (Spectrum).

Features: Oric Machine Code.
Gameplay: Fort - Apocalypse/ Pooyan (Atari), Death Cruise/ Ching (Dragon), Trench/Canyon (BBC), Football Manager/Fool (Spectrum).

Programs: French Text (Apple), Babyfall (ZX81), Count (Vic 20), Men/Arith (Vic 20), Road Hog (BBC).

Databases: Hardware.
Micropaedia: Everything you wanted to know about programming, part 5.

Issue 35, November 3-November 9.
Pro-Tests: Kaypro 10, Stock Control (Spectrum), Educational games (BBC), Brother EP22 electronic typewriter, ADS Centronics Interface (Spectrum).

Features: Tandy Graphics, BBC Operating System.
Gameplay: Vahalla (Spectrum), 64 roundup, Slinky (Atari), Hespert (64).

Programs: Mini Math (Spectrum), Multi-Square (Oric).

Databases: Peripherals.
Micropaedia: Everything you wanted to know about programming, part 6.

Issue 36, November 10-November 16.
Pro-Tests: Tiger from H/H, ZX81 Forth, Exmon (Oric), Cycle P20, Growth Tracker/Diet/Diet Master (Spectrum), U-Com 2 (Apple).

Features: Newbrain sound, BBC FX commands.
Gameplay: Creepers (Vic 20), Extremator (64), Spectrum roundup, Death Mins of Sins (Dragon).

Programs: Falklands Raid (BBC), Mini Math (Spectrum), Pyramid (Spectrum).

Databases: Software.
Micropaedia: Everything you wanted to know about programming, part 7.

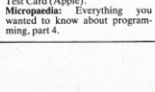
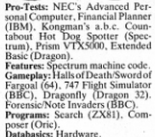
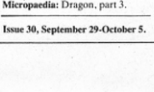
Issue 37, November 17-November 23.
Pro-Tests: Apicot, Paint (Atari), BBC Micro Toolkit, Spectradex Computerize (Atari VCS2000), Bio.

Features: Flight simulations, Spectrum screening.

Gameplay: Empire/Treasure Tomb, Crystal Chalice, Temple of Zoren (Dragon 32), Cobas Maze, Bewitched (Dragon 32), Cosmic Convoys/Planetfall (64), Bugaboo/Gor-gon (Spectrum).

Programs: City Defense (Oric), Falklands Raid (BBC), Pyramid (Spectrum), Monitor (64).

Databases: Clubs.
Micropaedia: Everything you wanted to know about programming, part 8.



Issue 38, November 24-November 30.

Pro-Tests: Coleco's Adam, Small Business Accounts (Spectrum), Masterfile (BBC), Monitor roundups.
Features: Apple programming, NewBrain editor part 1, Dragon action part 1.
Gameplay: Magic Dragon, Zap-Blue Mac (Atari), Skramble! Falcon Patrol (64), 737 Flight simulator (BBC).
Programs: Shipments (Spectrum), Monitor (64).
Databases: Hardware.
Microcopia: Guide to Monitors.

Issue 39, December 1-December 7.
Pro-Tests: Dragon 64, Tandy CGP-220, White Knight II (BBC), Cross Reference Utility (IBM).
Features: NewBrain editor part 2, Dragon action part 2.
Gameplay: Orc roundup, Haunted Hedges/Corridors of Genon (Spectrum), Microbe One Hundred & Eighty (BBC), Atari roundup.
Programs: Lower CLS (Spectrum), Shipments (Spectrum), Monitor (64), Basic Search (BBC).
Microcopia: Buyer's Guide to Micros.

Issue 40, December 8-December 14.
Pro-Tests: Times 2088, Thermal Printer TP-10, Cambridge Computing joystick (Spectrum), Beech-Whitby Synthesis Processor (BBC), Vizaviz Vizapal (64), Educational Games (Spectrum).
Features: NewBrain editor part 3, Dragon action part 3.
Gameplay: Pinball Wizard (Vic20), The Quest of Mervad (64), Way Nasty/Savage Pond (Atari).
Programs: Link Four (Spectrum), Tilt (Dragon).
Microcopia: Buyer's Guide to Peripherals.

Issue 41, December 15-December 21.

Pro-Tests: Apple II, Byte Drive 500, IMAC Power Cleaner, Commodore 1701 Colour Monitor, BCBasic (64), Database/MSC-Calc (Dragon).
Features: Computerised Psychopathy (BBC), Spectrum Display.
Gameplay: Microbot/Pettigrew's Diary (Dragon), 64 destruction, Groucho/Cherished Flag (Spectrum), Way Out/Butt Boot Jack (Atari), Super-Valders Outback (Vic 20), Danger Ranger/Up Periscope (Dragon 32).
Databases: Clubnet.
Microcopia: Buyer's Guide to Software.

Issue 42, December 22-January 4.

Pro-Tests: Spectrum add-ons (U-Microcomputers system), Onic-1 Filestar, Games Designer (Spectrum).
Features: Micros of 1983, Computer Security, BBC word processing, Dragon Action part 4.
Gameplay: International Football (64), Groucho/Cherished Flag (Spectrum), Way Out/Butt Boot Jack (Atari), Super-Valders Outback (Vic 20), Danger Ranger/Up Periscope (Dragon 32).
Databases: Clubnet.
Microcopia: Games Special.

Issue 43, January 7.

Pro-Tests: IBM Junior, Grafpad (BBC), Walters WM80 printer (Spectrum).
Features: Computerspeak, Spectrum Display, Tabs on Onic.
Gameplay: Colour Race/Pinball (Dragon 32), Colour Race/Pinball (Dragon 32), Hunter Killer/Mr. Wimpy (Spectrum), Crazy Cawman Goodness Gracious (64).
Programs: Jungle Chase (Oric), Screen Dump (BBC).
Databases: Hardware.
Microcopia: Electron part 1.

Issue 44, January 14.

Pro-Tests: Hitachi MBE-16002, Acorn Teletext (BBC), Integrex Colourjet printer, DTL Basic (64), Dian/Microprint 4251/Multiform (Spectrum).
Features: Adventure games, Colour game characters.
Gameplay: Devil Assault/Wasps & Dragon Racer (Dragon 32), A City/Forbidden Forest (64), Survival/Countdown (Vic 20).
Programs: Mindfield.
Databases: Peripherals.
Microcopia: Electron part 2.

Issue 45, January 21.

Pro-Tests: Portables - Commodore SX60, Olivetti M10, Acorn sparkjet printer, Turbo 20 day-wheel, Spectrum educational software, BBC graphics extension ROM.
Features: Bargain buys; Making money with your micro.
Gameplay: Viking and Pub (Dragon), Traxx and Wild West Hero (Spectrum), Atari/Commodore 64 round-up.
Programs: Battletaster Fighter (Commodore 64).
Databases: Software.
Microcopia: Electron part 3.

Issue 46, January 28.
Pro-Test: Apple Macintosh; BBC sideways ROM board; Interfaces for Commodore 64, Silver Reed EX44 typewriter/printer; Bridge on Spectrum and Dragon; BBC filing program.
Features: Buying by mail order; programming the Memotech.
Gameplay: Barry Burgers and Gangsters (Spectrum), Birdie Baroque and Planwalks (BBC), Blue Moon and Dancing Fates (Commodore 64).
Programs: Caves of Treasure (ZX81).
Clubnet: Microcopia: Modems and communication.

Issue 47, February 4.

Pro-Tests: Sinclair QL; Atari Touch Tablet; Silver Reed EX250 day-wheel; IBM Cobot; BBC Spell Check.
Features: Programming the micro; Part 2; Low cost printers.
Gameplay: Mothership and Quintessence Warrior (Commodore 64), Two Gun Turtle and Multigames (Oric), Space adventures, Spectrum round-up.
Programs: Pot Hole (Dragon).
Databases: Peripherals.
Microcopia: A to Z of Atari part 1.

Issue 48, February 11.
Pro-Test: Spectravideo 328; Atari 800XL; Dragon Link drives; low cost monitors; Attec C (Apple); BBC educational software.
Features: Sideways printing on Epson HX20.
Gameplay: Bedlam and Morris Meets the Bakers (Spectrum), Commodore 64 round-up; Zor-

gon's Kingdom and Flight Zero-One-Five (Vic 20).
Programs: Gridtrap (Lynx).
Databases: Peripherals.
Microcopia: A to Z of Atari part 2.

Issue 49, February 18.
Pro-Tests: Oric Atmos; tracker ball controllers; Spectrum speech synthesiser; Rainbow Writer (Dragon); Colour Game assembler (64).
Features: Computer jargon; 42-column display on Spectrum.
Gameplay: Quadtrix and Jelpac (Vic 20), Crazy Balloon and Superastro (Commodore 64).
Programs: Sprint generator (Commodore 64).
Databases: Software.
Microcopia: A to Z of Atari part 3.

Issue 50, February 25.

Pro-Tests: Sanyo MBC550; Commodore speech synthesiser; BBC real-time control interface; BBC machine code trace; Atari home utilities.
Features: Expanding your Spectrum; introduction to Lisp.
Gameplay: Urban Upstart and Godzilla and the Martians (Spectrum), Shuttlestar and Hooked (Dragon).
Programs: Minescape (Oric).
Clubnet: Microcopia: Printers part 1.

Issue 51, March 3.

Pro-Tests: Sharp's PC5000, Graphics Package (Oric), Fancy Font (CPM), Torch, Superbase Application Database (64), Printer round-up, IEEE 488 interface (BBC).
Features: Microdrive data files, Gamplay: Spectrum selection, Robotops (TTPW4A), Batty Builders/Bristles (Atari).
Programs: Millipede (BBC/Electron).
Databases: Hardware.
Microcopia: Printers part 2.

Issue 52, March 10.

Pro-Tests: Wren, MSX, Multisynth 64, Mr Ty Number Games etc (BBC, Spectrum), Hybridable (Oric, Atmos).
Features: Adventure games.
Gameplay: Dragon roundup, Snort/Free Fall (BBC), Spectrum round-up.
Programs: UFO (Vic-20), Morse Code (BBC), Gary the Guitarr (64).
Databases: Peripherals.
Microcopia: Printer part 3.

Issue 53, March 17.

Pro-Tests: Yamaha YR503, Tandy TRS-80 Model II (RS232), MDIFS (BBC), Toolkit (BBC), The Quill (Spectrum).
Features: Screen technology, Atari graphics.
Gameplay: Megahawk/Megawar (64), Castle of Doom/Fishy Business (Dragon 32).
Programs: Battle Stations (Spectrum).
Databases: Software.
Microcopia: Rescuing for the Atmos part 1.

Issue 54, March 24.

Pro-Tests: IBM's Portable PC, Spectrum keyboards, Beechfont, Games Designer (Vic-20).
Features: Atari graphics, Chip shortage.
Gameplay: Airstrike 2/Pole Position (Atari), Deathchase/Fighter Pilot (Spectrum), BBC roundup.
Programs: Odello (64), Charpatt (CGL M-5).
Clubnet: User groups and clubs.
Microcopia: Atmos part 2.

Issue 55, March 31.

Pro-Test: H-P 150, Light pens (BBC, 64), Micro-Prolog (Spectrum), Electron Graphics System.
Features: Spectrum routines, Consumer rights.
Gameplay: Patience/Metacallie, Janna Battle at the Edge of Time (Vic-20), Loku/Rat Split (Oric), Tennis (Atari).
Programs: Fast Draw (Dragon 32), Flash simulator (Atari).
Databases: Hardware.
Microcopia: Communications part 1.

Issue 56, April 7.

Pro-Tests: Vortex Type 'N' Talk, Line Interface (Spectrum), Commodore 64001 disk drive, Apple's Macintosh, Animator (Dragon 32), Knoware (IBM).
Features: Spectrum maths, Adventure in history.
Gameplay: Hunchback Aztec Challenge (64), Defence Force/Psychic II (Oric), Volcanic Planet (Spectrum).
Programs: Ace King (Vic-20), Lynx VAI.
Databases: Peripherals.
Microcopia: Communications part 2.

Issue 57, April 14.

Pro-Tests: Microkey, Mores Disk Drive Interface (Spectrum), Atari 1020x colour printer/plotter, FT Monotype (IBM PC, Sirius).
Features: Assembly course, Portables.
Gameplay: Learning games (Spectrum, Oric), Air Traffic Control!

Super Spy (Dragon), Neptune's

Issue 58, April 21.

Pro-Tests: Wrap-Bit Rabbit, Pixit Apple graphics, Edword BBC word processor, Bynatic Graphics/Paintbox/Melbourne Draw graphics toolkits on Spectrum, Premier Sprite board for Dragon.
Features: Commodore 64 extended Basic, Microdrives made easy.
Programs: C-File database for Spectrum 48K.
Microcopia: Spectrum, 64, BBC games reviewed.

Issue 59, April 28.

Pro-Tests: Grid Compass, Husky Hunter, Canon X-07, Apple Homeword, Commodore 64 CPM, Dragon Sprite Magic, Atari printers, Minor Miracles model.
Features: Assembler language.
Programs: Hubbert for Oric.
Microcopia: Spectrum, BBC, Dragon, Atari games reviewed.

Issue 60, May 5.

Pro-Tests: TRS80 4P portable, BBC Disk Doctor, Spectrum Taward II, Quinkey quacker, Bob robot.
Features: Oric FILL command.
Gameplay: Pystron and Red Baron (Spectrum), Avenger and Dragon Hawk (Dragon), Colour Genie round-up.
Programs: Poison Toad on Commodore 64.
Microcopia: Graphics on Commodore 64, Oric and Atari.

Issue 61, May 19.

Pro-Tests: Apple FX-8, Apple ProDOS, Commodore 64 Colossus 2 chess, Dragon Sprint compiler, Solidisk RAM expansion for BBC.
Features: Artificial intelligence, assembler P3.
Gameplay: Atari round-up, Commodore 64 round-up, Quest and Last Sunset for Lattica (Spectrum).
Programs: BBC/Electron 4D graphics, Oric renumbler, Commodore 64 split screen graphics.

Issue 62, May 26.

Pro-Tests: Compag, Dragon OS9, Spectrum educational packages, ExpressBase II, BBC buggies, Commodore 64 Kool graphics pad.
Features: Spectrum sound, Japanese peripherals.
Gameplay: Rapados and 1984 (Spectrum), House of Death and Operation Gremlin (Oric).
Programs: Dragon hires graphics, Commodore 64 graphics, Spectrum array sort.

Issue 63, June 2.

Pro-Tests: Apple IIc, Sord IS11, Canon dot matrix printer, Oric disk drives, Acorn 6502 processor and Buttick graphics system, Dragon sound package, Commodore 64 speech synthesiser.
Features: Oric Budget, assembler T4.
Gameplay: Galactic Warriors, Magic Meanies (Spectrum), Flying Fishes and Flamb Crazy (Commodore 64).
Programs: Oric assembler/dis-assembler.

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Envelope parameters on your micro

'Earn money from your computer' is the enticing claim in an advert from the Home Computer Earners Centre.

Imagine then the reaction of John Fraser, a PCN reader in Merseyside, when he sent off a self-addressed envelope and received in return a leaflet inviting him to send off a £2.95 'processing fee' for his 'FREE envelope collecting kit' to Curvestyle Ltd.

Curvestyle, apparently, has such a thriving 'commission mailers organisation' that it is willing to pay you 25p for every envelope you

collect.

'There's no mention of using your computer,' said Mr Fraser, 'and, worse still, you are asked to pay them £2.95 before starting.'

So we phoned Terry Scott of Home Computer Earners Centre.

'Oh no, he shouldn't have got that. That's the housewives program from our sister company. He should have got an invitation to send off for a manual kit which contains various programs,' said Mr Scott.

'And how much does that cost?' '£6.95,' he said.

And what do you actually get for your £6.95? 'It is an A to Z of ideas of how to make money from computers. You know, accountancy, invoicing and that kind of thing,' he said.

So now we know. And, no doubt, every envelope you use when writing to the Home Computer Earners Centre is sold by it to Curvestyle at 25p each.

After all, as Curvestyle says in its leaflet, it 'needs more envelopes to stuff with our order — producing circulars, and that is why we need your immediate help'.

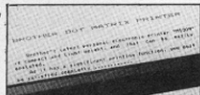
Oh Blother, that can't be light

There's a big market for cheap impact dot matrix printers, but sometimes you pay the price of cheapness. The Brother 1009, we hope, is not such a case, but the publicity leaflet does give you pause for thought.

'Budget friendly, home impact printer,' it trumpets. How

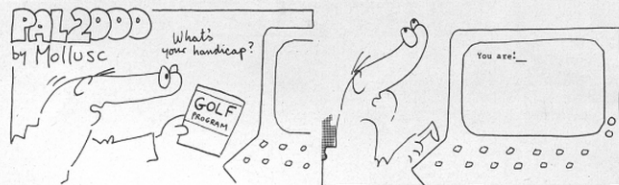
efficiently it operates after impacting on your home we can't really say.

Seriously though, the 1009 looks to be pretty good value, if the leaflet is to be believed. It is compact and light weight, and that can be easily opalated. 'So we lekcon that's or light then.



You should have no plobrems because 'as it has a significant printing function, you must be satisfied completely.'

And that's an order. . .



PCN DATES

PCN Datelines keeps you in touch with up-coming events. Make sure you enter them in your diary.

Organisers who would like details of coming events included in

PCN Datelines should send the information at least one month before the event. Write to PCN Datelines, Personal Computer News, 62 Oxford Street, London W1A 2HG.

UK EVENTS

Event	Dates	Venue
Scottish PCW Show	July 26-28	Assembly Rooms, Edinburgh
Advanced Technology	August 9-13	St George's Hall, Liverpool
Acorn User Exhibition	August 16-19	Olympia, London
Electron & BBC Micro User Show	August 31-Sep 2	UMIST, Manchester
IBM System User Show	Sept 3-5	Olympia
Hampshire Computer Fair	Sept 6-7	Guildhall, Southampton
PCW Show	Sept 19-23	Olympia
Computer Communication & Control	Sept 26-28	Brighton Centre
Computers in Action	October 30-Nov 1	Anderson Centre, Glasgow

Organisers
Scottish Industrial & Trade Exhibitions
Advanced Technology, 051-236 0121
Computer Marketplace Exhibitions 01-930 1612
Database Publications, 061-456 8383
EMAP International Exhibitions 01-837 3699
Testwood Exhibitions, 0703-31557
Montbail 01-486 1951
Institution of Electrical Engineers 01-240 1871
Trade Exhibitions, 0764 4204

OVERSEAS EVENTS

Event	Dates	Venue
SE Asia Regional Computer Conference	Sept 24-27	Hong Kong
Computer Exhibition — Comdex/Europe	October 29-Nov 1	Amsterdam, Holland
Videotex Europe Exhibition & Conf.	November 20-22	Amsterdam, Holland

Organisers
Industrial & Trade Fairs International, 021-705 6707
Interface Group Inc, Amsteldijk 166, 1079 LH Amsterdam
Online Conferences Ltd, 01-868 4466

SLANTAX ERRORS

In our review of the Casio FP-200 (Issue 69) we implied that the reference manual and the Powerful Library of software was included in the purchase price.

Casio now tells us that there is an extra charge for these books.

We also made a small error in last week's story about BT's Bitstream project. The transmission rate is 1200 baud and not the 75 to 300 baud we quoted.

NEXT WEEK

Olivetti's IBMulator — Does AT&T backing guarantee a healthy future in the crowded field of IBM compatibles?

Integrated Software — We review the leading contenders to find out just how integrated is 'integrated'.

Acorn Prestel — Yet another box to put next to your BBC micro. Is it worth the money?

Atari collisions — How to get the most out of sprites on the Atari.

Machine code madness — The last part of our series on Z80 Assembler.

Gameplay — We cry wolf with two games for the Spectrum and a round-up of the latest releases for the Commodore 64.

Programs — A change of character with this Greek and Gothic character set program for the Vic-20, plus a disassembler for the Dragon.

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A 16-bit Personal Business Computer for Professionals.

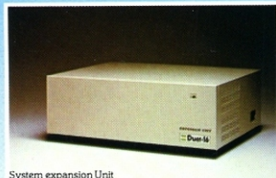
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