

POPULAR **Only 40p.** Computing WEEKLY

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The best selling weekly

Vol3 No 30



Graham Clark

Major shake-up for Atari UK

THERE has been a major shake-up at Atari UK, just three weeks after the US parent was taken over by a company headed by ex-Commodore chief Jack Tramiel.

Atari UK's managing director Graham Clark has resigned, and many of the UK sales and management staff have been sacked.

Clark has been replaced, initially by Simon Westbrood, previously Atari UK's financial controller. He will remain as acting managing director until a successor can be found.

Tramiel resigned his position as president of Commodore in January this year, and since his dramatic purchase of Atari from Warner Communi-

cations, several key Commodore executives have joined Tramiel's organisation in the US.

The upheavals at Atari UK are seen as part of a strategy to streamline the loss-making company and sell Atari products through appointed distributors rather than through the company's own sales force.

Activision sues Microdeal

MICRODEAL, the Cornwall based software company which last week took two Blackburn brothers to court in a software piracy action, has itself been taken to court.

American company Activision instituted proceedings in the High Court on the grounds that Microdeal's *Cuthbert in the Jungle* is a copy of *Pitfall*. Activision claims that the consumer would be hard-pressed to distinguish between the two on the Commodore 64.

"We applied to the court for an injunction to prevent Microdeal selling *Cuthbert in the Jungle*," explained Geoff Heath, UK managing director of Activision. "However, after reviewing the writ and our prosecution papers, Microdeal obviously felt our case was watertight because they didn't fight it.

"They gave the court an undertaking that they would not reproduce, adapt or copy *Pitfall* in any form, and have written to suppliers to say that *Cuthbert in the Jungle* can no longer be sold.

"Our intention was to fight the case on the grounds of a breach of copyright. Happily it didn't come to that.

"We had been working on our approach to this case for some time, but obviously the

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INSIDE > HAIL CAESAR > EVIL DEAD > SECRETS ON 64 >



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Microdeal ought to be very embarrassed.

In the same week that it sought the protection of the High Court to halt the activities of a commercial piracy racket in Blackburn, it was itself on the receiving end of a court case brought by another software house, Activision.

Activision claimed that Microdeal's game *Cuthbert in the Jungle* was a copy of its own *Pitfall* game. Microdeal admitted it was in the wrong and has since given an undertaking that it will withdraw *Cuthbert*.

This is not the first time Microdeal has been caught out. Nintendo claimed last year that Microdeal's *Donkey Kong* game was a version of *Donkey Kong*. On that occasion Microdeal agreed to change the name of its game to *The King*.

Microdeal is by no means alone. It just isn't good enough for software houses to start kicking up a stink about piracy — forming themselves into groups, GOSH and FAST, with the aim of fighting piracy — when their own house is in such disorder.

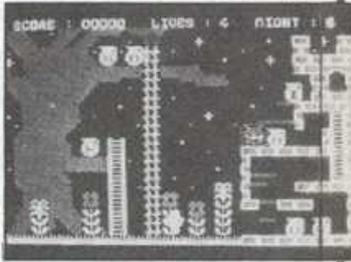
Hardly a one of them doesn't have at least one skeleton in the closet. *A Pac-Man*, an *Asteroids* or *Scramble*. How many currently have a version of *Q-bert* in their catalogue? And when the Olympics arrive just wait and see how many *Track and Field* clones crawl out of the woodwork.

Suppose someone eventually succeeds in proving that software is copyright and/or a private members' Bill imposes substantial fines and possible imprisonment on offenders?

Who then will be first against the wall when the revolution comes?

They will.

>Presents...

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>Futures...

How to get started with networking — let your micro do the walking... *Delta Queen* is the Spectrum Star Game piloting a Mississippi paddle steamer... and *Paintbox* on the BBC, a two part easy-to-use graphics utility.

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Quest develops CP/M system for QL

QL OWNERS should be able to run CP/M software on their machines.

Hampshire-based Quest Automation will be converting Digital Research's CP/M 68K operating system to run on the QL.

"It will, in effect, mean that all CP/M software will run on the QL," said Quest's Grant McKeown. "Although the system is written to run with the 68000 chip, there are a few changes that need to be made for the QL.

"We feel that this will provide the key for using the QL for business purposes."

CP/M 68K for the QL is planned to be available in October

priced at £49.50. Quest will also shortly be announcing hard and floppy disc drives for the QL as well as add-on memory for the machine. Details from Quest Automation, School Lane, Chandlers Ford, Hants.

● A joystick adaptor for the QL allowing any Atari-standard joystick to be connected is now available at £6.00 from Timedata, 16 Hemmells, Laindon, Essex.

Ivan Berg — Mirrorsoft tie-up

IVAN Berg Software has teamed up with Mirrorsoft to release a range of new titles for the Commodore 64, Spectrum, BBC and Electron machines in September.

These include *Know Your Psi-Q* — testing your psychic power and a no-diet weight control system designed by Professor Justin Joffe. Versions of *Know Your Personality* and *BBC Mastermind* will also be released on the Spectrum and BBC machines.

MSX versions of all the titles are planned through Mirrorsoft before Christmas.

Activision

continued from page 1



John Symes of Microdeal

release of *Pitfall* in Britain, and its conversion to the Commodore 64 has accelerated proceedings."

Microdeal's solicitor, Michael Drynan, confirmed that Activision had an open and shut case. "Microdeal obtained the license for the game from Tom Mix in the States in good faith. But when we compared our licence with Activision's, theirs appeared to have been agreed first, so we were happy to withdraw."

Activision will now be taking action against Tom Mix in the US, again on copyright grounds.

Microdeal has, however, been successful in its case against Dr Tariq Mohammed who with his brother, 14 year old Mohsan, copied Dragon games from Microdeal, among other companies, and sold them at much reduced prices. On Friday, July 20, it obtained a further injunction preventing Mohammed from copying and selling Microdeal's games. After the ruling, Microdeal has decided not to pursue a full trial.

Menzies opts for electronic software

TWO UK distribution companies are hoping to change the way you buy your software.

Program Express of Edinburgh and Micro Dealer UK have jointly launched a scheme to download software from 'retail modules' installed in individual shops.

Explained Neil Johnson, Micro Dealer's managing director. "Customers will first look at a menu on the unit's display to see which titles are available. When they have decided which they want, they buy a blank cassette, disc or cartridge and slot it into the machine. Twenty seconds later the software is downloaded into the cassette or whatever via the machine from a central host computer." The system is still under evaluation but Neil

hopes that the first such machines will be in the shops by October this year.

The cost of software bought from the system should be the same as a conventional cassette, cartridge or disc.

A similar system, Romox has been tried in the US but has yet to get a full-scale trial. Prism, which has the UK rights to Romox has yet to evaluate the system in the UK.

So the Program Express/Microdealer system could become the first operation of its kind to go on trial in this country. Already John Menzies has shown considerable interest. "We have ordered five machines," said managing director Robert Black. "It means we will be able to have a full range of software available to customers all the time, and will save a huge amount of storage space. We hope to have our first machines installed before Christmas."

Enterprise move

SINCE losing its exclusive distribution contract with Sinclair, Prism has gained the distribution rights for the new Enterprise computer as well as the Oric Atmos.

Prism will distribute the Enterprise through a national network of retailers and dealers, although Enterprise has retained a small number of accounts to supply direct.

First deliveries of the Enterprise are due in September.

Oric price increased

THE price of the Oric Atmos has been increased by almost £20 to £189.95. The company is blaming the dollar exchange rate for the increase.

"At present Oric is building up stock levels quickly in time for Christmas," explained an Oric spokesman. "But the strong dollar makes the price components high, and we have had to raise the price accordingly."

Oric announced record June sales of £2½m, largely taken up by £1½m sales to France, although Italian and German orders also increased. Only 30 per cent of this figure — about 4,500 units — went to the UK market.

The prices of Oric peripherals remain unchanged.



UP IN THE AIR. Virgin's new in-house programming team is to produce its first games for the Commodore 64 and Spectrum in September. The five-strong team is (left to right) Ian Mathias, Pat Mitchell, Dave Chapman, Andy Wilson and Steve Webb.

Rabbit bounces

RABBIT Software, best known for its Commodore games such as *Troopatruck*, has gone into liquidation.

The company had been in difficulties for some time following the death earlier this year of its founder Alan Savage.

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Consider the facts

I was very annoyed to read Justin Kerswell's letter in the July 12 *PCW* complaining about games not being released on the Commodore 64 until after they have been released on the Spectrum.

He is obviously suffering greatly from jealousy and not considering the facts. The Spectrum has been out longer than the CBM64. Any programmer writes on the machine he has which, more often than not, is a Spectrum. The problem is then for the software house to find a suitable author to convert programs from their original form onto other machines and games can sometimes be very hard to convert from the Spectrum to the 64.

As far as sound is concerned, the Spectrum is a bit pathetic but some games manage to overcome this — *Ugh!* is one example.

If the 64's graphics are so good why does Mr Kerswell want *Atic Atac* and *Jetset Willy* on the 64?

Surely, he can find some thing better on his own machine.

Alan Fairburn
69 Pontamman Road
Ammanford
Dyfed
Wales

Shake-up reviews

I would like to add to the comments following Boris Allan's *Ziggurat* on unsatisfactory reviews in the June 21 *PCW*.

I am fed up with reviewers comparing games for one computer with those for another. For example, when *The Hobbit* was first reviewed it was described as "the game by which all other adventures will be judged". As a result any new adventure is given a bad review if it isn't all-singing, all-dancing with hi-res colour graphics and three-part harmony music. In one magazine I read a review for a Dragon program that was totally derisory — simply because it wasn't as good as *Jet Pac* on the

Spectrum.

In some magazines the same people review for five or six different computers and are nearly always biased towards one in particular.

The whole system of games reviews in computer magazines needs a big shake-up. People with experience on a particular machine — who understand how it works — should be used.

Simon Mills
7 Boundaries Mansions
Boundaries Road
London SW12

Only sympathy

I was interested to read in the July 19 Issue that Clive Gifford — a reviewer of some 80 books and items of software — did not like my *Ziggurat* in the June 21 *PCW* concerning uncaring reviewers and reviewing.

Mr Gifford was even offended by my piece. All I can offer is sympathy — most people seem to agree with me...

Boris Allan
Stockport

Not quite right

I am writing to complain about your News Desk feature, and your apparent disregard for smaller companies wishing to appear in it.

Three weeks ago, we applied to appear in News Desk. We had produced a pack of listings for Dragon owners for use with the television series, *Me and My Micro*. We thought this was a useful service, and decided that it was worthy of



inclusion in News Desk.

We then telephoned you, to see what your reaction to the inclusion of such a feature was, and we were told 'Oh yes, that is definitely worth considering'. We forwarded a letter detailing our product, as requested, then we waited. And we still are.

Two issues of your magazine have passed, the first of which contained an advertisement placed by us, yet still no mention. We are prepared to accept that in the first of these issues, your space was swallowed up by a large feature on Dragon's carve up, but in the second issue, we can see no excuse for not including our piece. You had two pages instead of one. I am sure that our piece would have generated more interest than a stupid and rather sick cartoon.

In the future, could you try to give more thought to what you do and do not include. Remember that it is not only large companies who have useful services to offer.

Mark A Blease
Oron Software
64 Prince Street
Rochdale
Lancs OL16 5LJ

You seem to have got hold of the wrong end of the stick.

Every week we have far more news than we can possibly print and something has to go. The Newsdesk feature is not something you can make an application to appear in. And I'm afraid I don't share your view that our cartoon was "stupid and rather sick". I rather liked it.

A case of DIY

If like me you have purchased an Amstrad CPC464 computer and wish to use the centronics printer interface, you will probably have experienced difficulty obtaining a printer cable.

A phone call to Amsoft produced the information that they do not intend to make one available until their own printer is launched in September, and even then it probably won't be sold on its own.

It was obviously a case of

DIY. A solderless (IDT type) 36-way Amphenol connector for the printer and 34-way ribbon cable were easy to obtain from Technomatic, 305 Edgeware Road, London W2. A solderless 34-way, edge connector seemed non-existent, however, until I looked in Tandy and there it was — Part No 276-1564.

Although not strictly necessary, it is possible to insert a key in the edge connector (between contacts 3-4 and 21-22 — using Amstrad rather than Tandy numbering) by carefully sawing a small slot and glueing in a suitable piece of plastic. Fitting the connectors to the ribbon cable is easily done in a vice, but be sure you get them the right way round, with positions 18 and 36 of the Amphenol plug unused.

Total cost was about £12.

D M Bryant
4a Kenilworth Road
Petts Wood
Orpington
Kent

Rom failure

Reading the 'Answers to Queries' pages of computer magazines gives a fair indication of the frequency of faults (and bugs) on various machines.

It is only recently that the question of faulty Roms has come up. I wonder just how many Roms, which are in perfect condition during the early life of the machine, become 'bugged' as mine has. In my case the contents of an address used during loading has altered its contents. Luckily for me my Rom failed in an obvious way — the machine refused to load. But say an address affecting calculations had altered: say, my VAT return had been affected in some way, or a pharmacist's NHS return had come up with false figures, who would have been responsible?

How often do Roms fail? I would be interested to hear of your reader's experiences. Does anyone know why they fail?

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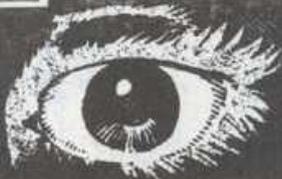
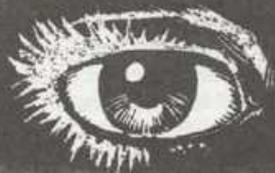


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QED??



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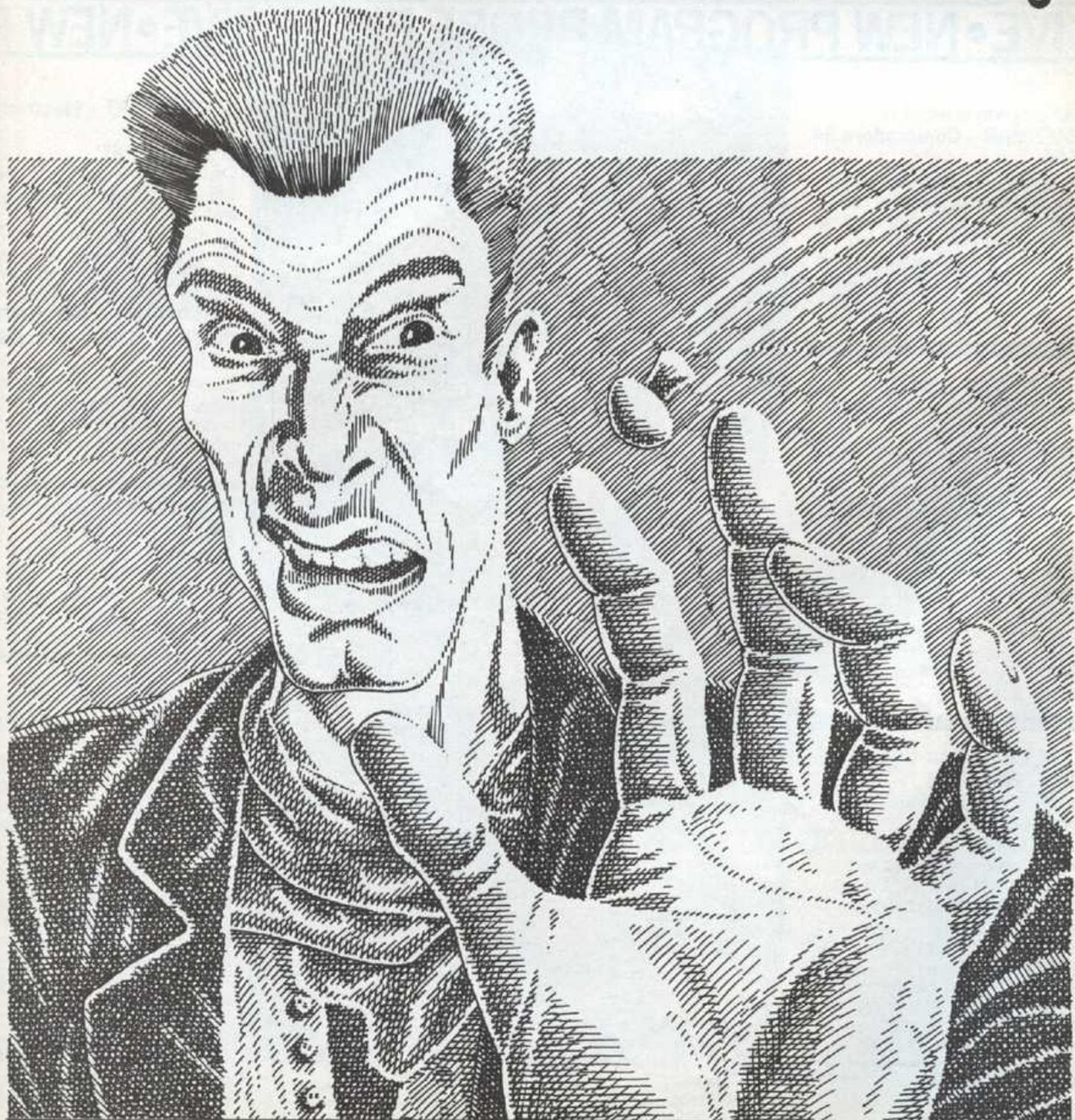
Deathcap

Act quickly to avoid the fatal fungi in this new game for the Commodore 64 by Garry McPheators

The object here is to collect all the balls lying around, while taking care to avoid the deadly mushrooms and bricks. Colliding with bricks will mean you must start

the game again, but you'll lose a life if you bump into a mushroom. Each ball retrieved earns you five points, and there's a 300 point

bonus, plus an extra life if you reach 200. But the going gets tough at this point, with landmines appearing to thwart further progress.



Trip of a lifetime

Christina Erskine talks to the threesome at Triptych Publishing

Take an ex-Army captain, a mass market book publisher, and an Australian civil engineer. Could this be the ideal mix for a new software house?

Certainly the triumvirate in charge at Triptych Publishing seem to think so. From hopeful beginnings at the London Business School, they are now on the point of launching a suite of six programs, aimed at bridging the gap between the home and business market.

"We met one another while doing the year-long Sloan programme at the Business school," said managing director David Juster, the former army officer. "Since everyone who does that particular course is expected to become a big boss after graduation, we were all full of ideas as to what to do after we'd finished."

It was David, too, who initiated the idea of going into computing. "I had come to the conclusion that computers were A Good Thing, and bought myself an Apple. Then I wasn't quite sure what to do with it, so I had to identify other computer buffs on the course and pick their brains."

David correctly identified civil engineer Stuart Armstrong, now Triptych's managing editor, and plans for a computer business began in empty lecture rooms at the end of the day.

"Originally we wanted to go for software in the educational market," continued David. "But as we went into the idea in more detail, we came up with one area where we felt there was a definite need."

Triptych's programs now fall into the applications category, with an education bias. 'Integrated applications through learning' is how they term it now, having

discovered that 'Adult-orientated software' had dubious overtones for some people!

The third member of the founding troupe, Duncan Baird, came in to provide useful publishing experience, to add to Stuart's technical know-how and David's management interest.

"We knew who our target audience was; people who have bought a micro and want to put it to serious use without necessarily learning to program," explained David.

"And we wanted our products to offer more than things like home budgets — after all, if you can't do your monthly accounts on the back of an envelope you might as well employ an accountant.

"The first six programs are fair indication of what will follow. *Entrepreneur* is a program designed to help someone set up a small business — you tap in projected figures, and the program will tell you what sort of profit you'll make, and what are the things to look out for. In some ways, we could have done with *Entrepreneur* when we set up Triptych."

Numbers at Work is a kind of adult numeracy program, which can help with anything from arithmetic to how to fully understand mark-ups, simple and compound interest and so on.

"Equally, *Project Planner*, *Decision Maker* and *Forecaster* can be used by either business people or interested home users.

Then we plan that about a quarter of our output will concentrate on more general topics. The first of those to come out will be *Star Watcher*, a comprehensive astronomy program."

Each of the program packages

comprises three parts: a teaching program designed to initiate the user into the subject, an applications program where they can use their knowledge to good effect and an accompanying book.

"The book contains anything that we feel is appropriate to text than to the micro — things you would want to flip through and refer back to, and which would take up memory space as reams of text on the screen," explained David.

Prices have been kept as low as possible — from £14.95 for Spectrum programs to £19.95 on the Commodore and BBC to discourage people from thinking the programs are either specialist or heavyweight. Triptych hopes its programs will be absorbing and interesting rather than simply educational.

"We've been very pleasantly surprised by some of the reactions to the titles. Stuart's wife, who had always been of the opinion that the only use for a home micro was to play *Pacman*, spent half an hour with *Project Planner*, and is now insisting that she gets a copy for the travel business she runs."

Confident though they are that they have found an untouched seam in the software market, there is still the problem of getting this across to the consumer.

"Quite honestly, it would have been helpful if one of the big companies had started doing this sort of thing already and paved the way for us. But while there are databases, word processors, spreadsheets and so forth around in abundance, there doesn't seem to be too much telling how to manipulate them and what sort of situations they are useful for. So it looks like we have to start the ball rolling.

"We really felt, 18 months ago, that the market now would be a lot more sophisticated than it actually is — and I wonder if the very mixed quality of today's software hasn't begun to put people off."

The trio went into every aspect of their image with a good deal of care. Some of the longest arguments arose over the company's name.

"We were adamant that we would not be Microsomething or Compusomething. We see ourselves as a creative editorial team, rather than overtly technical. Our name would have to be something esoteric, and something amorphous."

With a vocabulary like that, it is not surprising that David thought of Triptych. "I was amazed we hadn't thought of it before. A triptych is an artwork in three parts; there were three of us, and there are three parts to each of our programs — it fitted like a glove."

'Publishing' was added to avoid confusion with a Corby construction company with the same name, and their advertising agency thought up the name *Brainpower* for the program series, having presumably decided that Triptych could be too esoteric and amorphous for the mass-market.

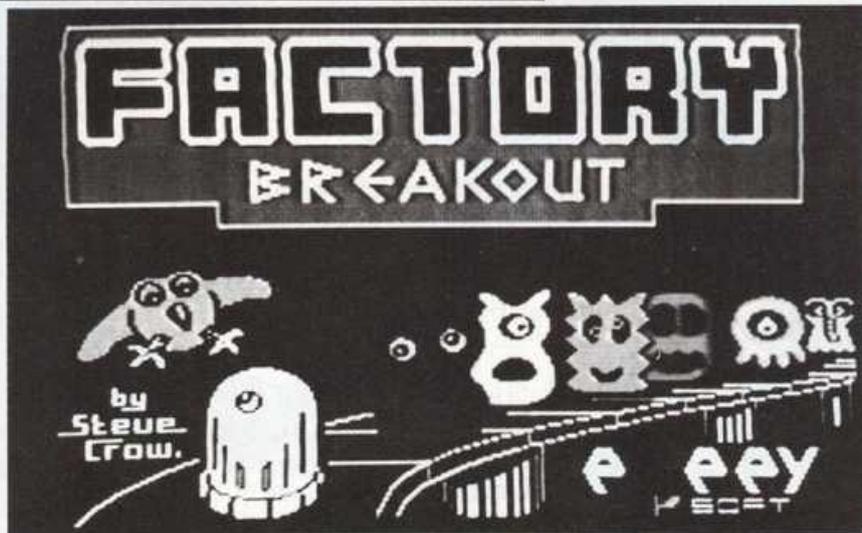


From left to right: Duncan Baird, David Juster and Stuart Armstrong

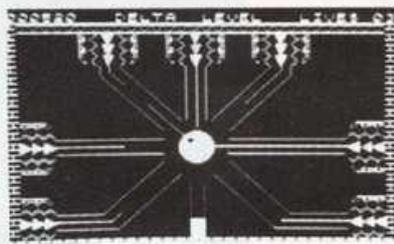
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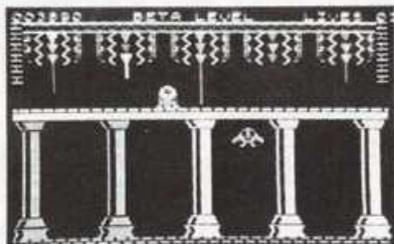
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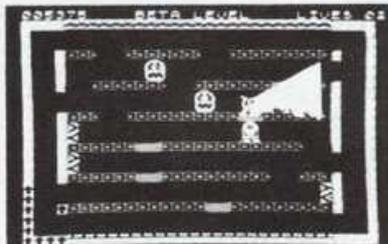
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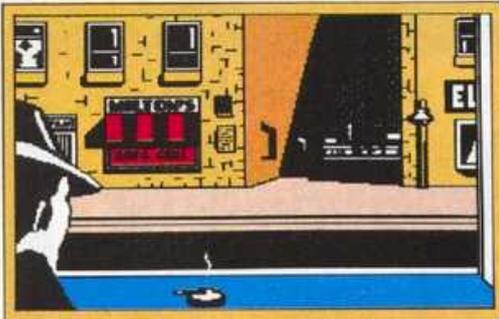
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All versions of 'The Hobbit' are identical with regard to the adventure program. Due to memory limitations, BBC cassette version does not include graphics.

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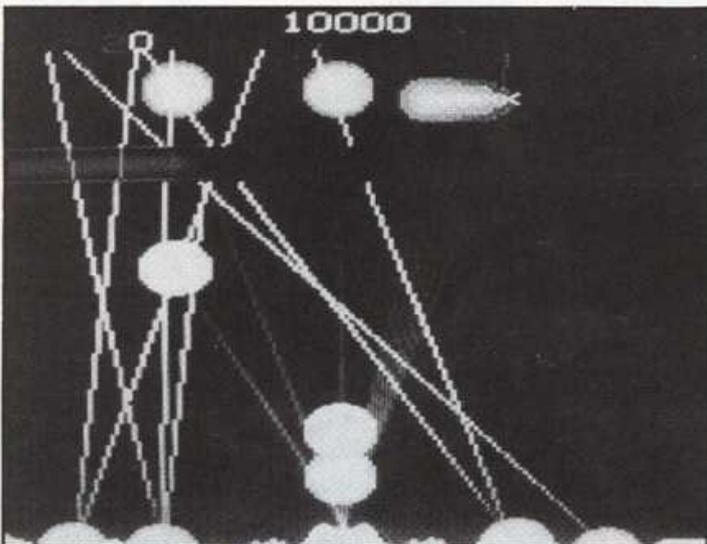


Melbourne House

Tracer bullets

Program *Missile Strike Micro*
BBC B **Price** £7.95 **Supplier**
Superior Software, Regent
House, Skinner Lane, Leeds
LS7 1AX.

Superior Software bill this as "the classic defence of six cities". It is. That's the good news and the bad news.



The screen shows a landscape with six blue cities. Waves of attackers streak down like tracer bullets to destroy them and your missile base. Using keys or joystick you move a cross-hair sight over the screen and fire at the attackers. You have to aim ahead of the incoming missiles as it takes a few moments for your defence rockets to rise.

Every now and then a huge aircraft or flying saucer appears and you get extra points for blasting it. You guessed it — another version of *Missile Command*.

On the plus side it's a very good implementation with fast response, clear graphics, decent noises and a number of increasingly nasty homing missiles in later stages. On the minus side — that's all it is.

We've seen games very like this so often that newcomers have to show more imagination and novelty than this to be appealing.

If it were a bargain-price tape it might pass, but as a full-price program it will only duplicate those you already have on the shelf.



Dave Watterson

Space spiders

Program *Laser warp Micro*
Amstrad **Price** £7.95 **Supplier**
Amsoft, 169 Kings Road,
Brentwood, Essex.

Laserwarp is one of approximately 60 programs in the first batch of titles released by Amsoft for the new Amstrad computer.

The plot of this arcade type game is nothing new: stop the "Master" from taking over the Galaxy by shooting a hole in his "Phoenix"-type mothership and then killing him. The only problem is that there are eight fleets of his minions to be destroyed first, including some very cute Galactic Spiders, Ar-

moured Droids and Hyperspace Chickens, all of which fire homing missiles at you. Each fleet also contains a number of indestructible craft which attempt to ram you. All pretty standard stuff.

It is very easy to play, being both joystick and keyboard compatible, as well as offering a practice mode, although the "Hold" key failed to work. The graphics are quite good, but the sound doesn't make full use of the machine.

Laserwarp is in fact very unexciting to play. The only attack wave that offered any real challenge is the one against the Master himself.

Greg Pearson



Grid games

Program *Noguard 32* and
Connect 4 Micro Dragon 32
Price £4.95 **Supplier** Oran Sof-
ware, 64 Prince St, Rochdale,
Lancs OL16 5LJ

Two popular games — *Connect 4* and *Othello* (called *Noguard 32* here) are contained on this cassette. Both are, of course, grid games. In *Othello*, each player must capture squares in order to take control of adjacent blocks. The object is to own more squares than the other player when all blanks have been filled. In this version high resolution graphics are used and the captured squares marked with a sunburst effect.

You can play either the computer or another player; against the computer, it is not too difficult to win.

Connect 4 is the game where the grid is seen as a series of columns and the player can take the next available square in any column building from the base. The object is to achieve four squares in any straight line. This version uses colour graphics.

This is very much an economy pack and good value at £4.95. There are no frills in either the games themselves or in the packaging but certainly the games are as authentic on the computer as on the original board versions.

Derrick Trueman



Rare jewels

Program *The Pit Micro*
Commodore 64 **Price** £9.95 **Sup-
plier** Thorn EMI Software, Film
House, 142 Wardour Street, Lon-
don W1V 3RU

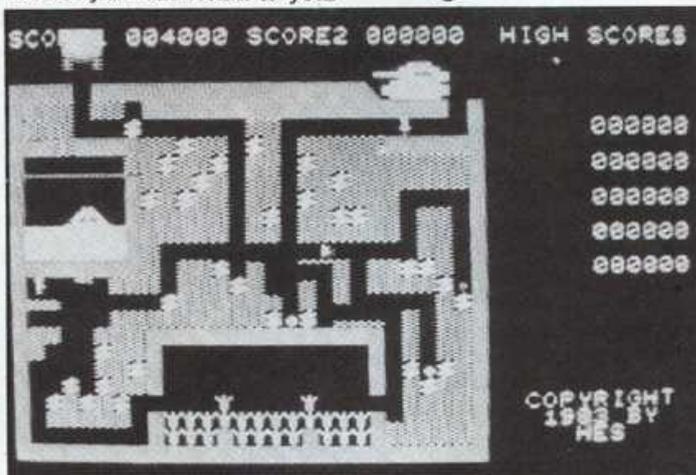
The Pit from HesWare seems very much like a throw-back to the early days of arcade games — it has only a single screen and no frills like music or different levels of difficulty.

The plot revolves around mining for rare jewels beneath the surface of an alien planet. The mine is guarded by robots which try to prevent you from reaching the jewels, but they are easily avoided or shot. Before you can return to your

ship, you must seize at least one of the large jewels from the Pit which is at the bottom of the mine. The jewels in here are guarded by deadly missiles. In order to get back to your ship you have to leave the Pit via a chamber containing a monster swimming in green slime. If you negotiate this bit successfully, the whole process is repeated again and again.

A pretty basic game. People who still enjoy *Space Invaders* may well find it of interest, but players who have become used to the faster and more sophisticated games now available will find the repetitive action and simple graphics and sound pretty unexciting.

Richard Corfield



Oops! We missed out the details from last week's review of *3D Tank Duel*. Here they are: **Micro 48K Spectrum** **Price** £5.50 **Supplier** Realtime Software, 32 Sovereign St, Leeds.



Time and logic

Program *Castle of Dreams*
Micro 48K Spectrum **Price** £7.95 **Supplier** Widgit Software, 48 Durban Road, London N2.

Castle of Dreams is a straightforward educational adventure game consisting of various puzzles and problems (differently arranged each time you play) which must be tackled successfully in order to progress through the castle corridors.

Provided with the game tape is a booklet describing the half dozen tasks you will tackle. These vary in difficulty: some, like matching some figures with their reflections, take time and logic; others, like using keys to pass through

different colour odours, are easy — unless, that is, you are using a black-and-white monitor. You'll need good mental arithmetic for the Mosaic Floor — but I'll let you find out why for yourself.

Unlike many other games there is no chance to save a partially completed game to tape, so you will need to book a good slab of computer time before playing.

The title is one of the shorter and more accessible adventure games around and so is ideal for the newcomer to decide if he or she really wants to get into the world of micro adventures. It won't challenge *The Hobbit* but it should find a niche in the market as a good beginners adventure.

Simon Springett



Sprite data

Program *Go Sprite* **Micro** Commodore 64 **Price** £9.95 **Supplier** Mirrorsoft, Holborn Circus, London EC1.

One of the main complaints about the Basic on the Commodore 64 is that it is very difficult to make use of the advanced feature supported on this machine — high-resolution graphics, sophisticated sound and sprites.

Not surprisingly a large number of utility programs and Basic extension packs have appeared to fill the gap. *Go Sprite* from Mirrorsoft is one of the latest, a sprite development program which enables you to design, display and animate sprites.

The main program has three principal screens — one for editing sprites in either hi-res or multi-colour modes, one for selecting priorities, overlaying and copying sprites, and one

for animating them. On all screens functions are selected and controlled using a fashionable icon-driven command system similar to that used on some business micros. Up to 32 sets of sprite data can be created simultaneously making quite sophisticated effects possible. Once defined, your sprites can be saved on tape or disk for later use.

As well as the main program, the tape also provides four sets of sample sprite data and another program which generates Basic data statements from raw sprite data.

In a short review it is impossible to cover all the details of a package as sophisticated as *Go Sprite*. It is a complete sprite development tool, and is a very professional product. The command system is easily learnt, and once mastered it is very quick to use. Overall, this is an excellent utility.

Richard Corfield



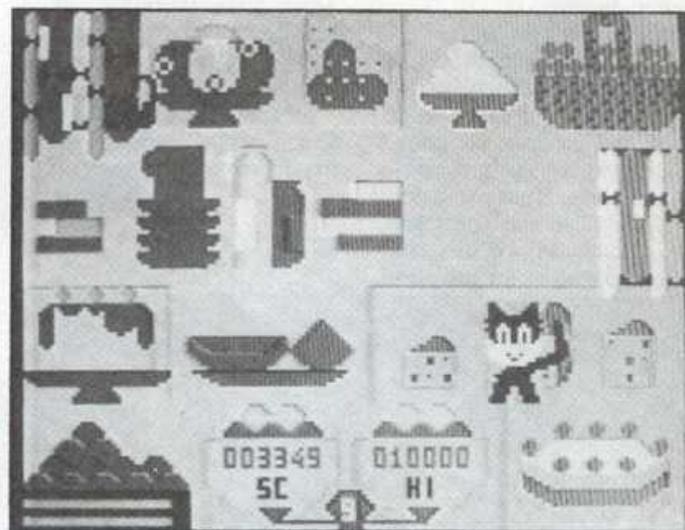
Nine lives

Program *Caesar The Cat*
Price £6.95 **Micro** BBC B **Supplier** Mirrorsoft, Holborn Circus, London EC1P 1DQ

Kittens are lovable but destructive beasts. Let loose along the shelves of a crowded larder an enthusiastic cat chasing mice can easily knock down dishes. If he catches the mice you might forgive him, but if he destroys your favourite china he's out on his ear! That's the basis for Mirrorsoft's *Caesar The Cat* game.

If he dislodges a red dish it's all over and the game ends. His mission is to pounce on various mice — thirty of them invading the larder. The quicker he does it the better. Think of the starting points as his lovability index — the less efficient he is and the more he breaks the less easy he is to be fond of. When he (and you) are good enough to clear out all the mice you start again with a faster, harder game . . . up to ten levels. (It ought to have been 9 lives really.)

The animation is superb, the screens colourful and the music good. Caesar can be control-



A very colourful larder is shown, though the shelves themselves are not outlined. Caesar can jump up and down so long as he is between items of crockery. If he jumps on a dish it falls and points are lost.

led by keys or joysticks. It is great fun but I didn't find it compulsive.

Jan Watterson



Gremlins

Program *Mr Wiz* **Micro** Electron **Price** £7.95 **Supplier** Superior Software, Regent Street, Skinner Lane, Leeds LS7 1AK

Once upon a time there was a cute little pixie called Mr Wiz, who had mixed blessings. He lived in a garden full of cherries and apples but was perpetually being chased by the horrible gremlins who lived in the mushroom at the centre of the garden. They had this nasty habit of popping out of the mushroom whilst Mr Wiz was busy gobbling up as many of the cherries as possible before his final fate of being

eaten by the gremlins.

Luckily for Mr Wiz he had three lives; apples he could drop like bombs onto the nasty gremlins, and a final desperate measure he could kick his crystal ball at them.

Unfortunately for Mr Wiz, life in the garden was always short lived and he didn't by any means live happily ever after — least not with me in control.

About Mr Wiz I have mixed feelings. I liked the idea and the high speed chase which is the basis of the game. I disliked the never-ending music which accompanies the game like never ending ice-cream van chimes.

Fred Short



Slowed down

Program *Supercode II Micro*
16/48K Spectrum **Price** £9.95
Supplier CP Software, 17 Orchard Lane, Prestwood, Great Missenden, Bucks HP16 0HN.

Supercode II is a new version of CP Software's original Supercode Spectrum toolkit, now with more routines and compatible with Microdrives.

The routines can be used in both 16K and 48K machines, but with the larger memory you also load a Basic program which will demonstrate the routines in use.

Supercode's facilities include screen manipulation and scrolling routines, sound generators including a useful laser sound, and program compression, protection and manipulation routines. These include *On Error Goto* and *On Break Goto* — both useful in program writing as well as for program

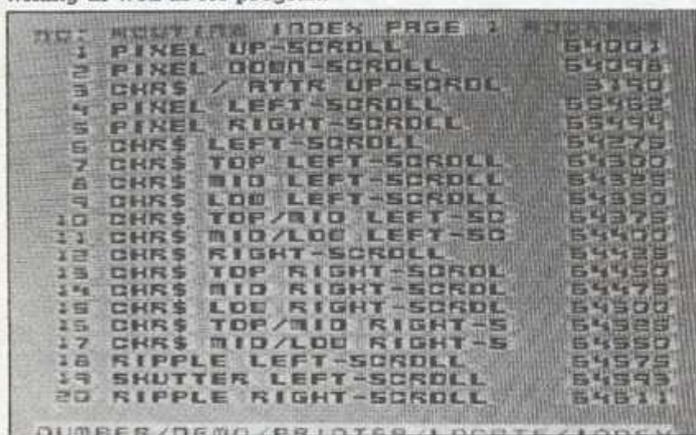
protection. All the routines seemed to work, although not all were quite as useful as they might seem: I tried the Contract Program option to speed up a game I had written in Basic, only to find it slowed it down!

The program includes a useful Save to Microdrive option, but he warned — the saving operation re-formats the cartridge, deleting any other data on it.

The program was supplied with two manuals: the original Supercode version and a supplement explaining the new routines and Microdrive options. This arrangement is, frankly, a bit of a mess, and the sooner the two are combined into one the better.

Meanwhile, Supercode II offers a wide range of useful routines at a fair price.

Simon Springett



Magic carpet

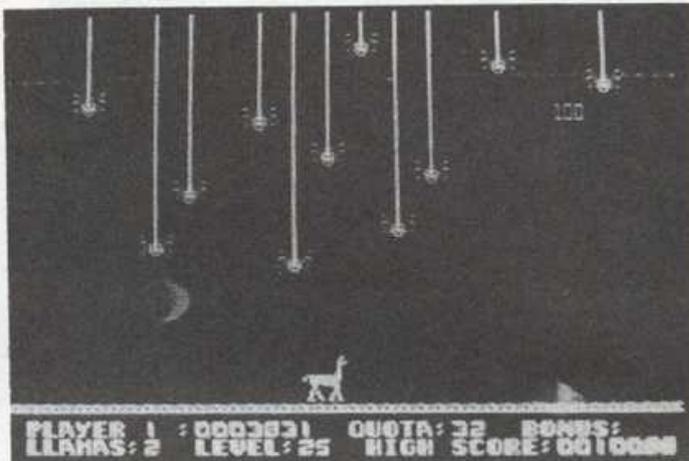
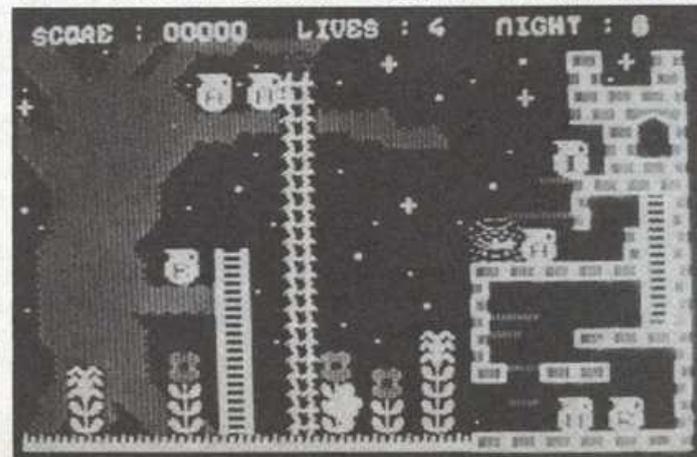
Program *Tales of the Arabian Nights Micro* Commodore 64
Price £7.00 (cassette) £9.00 (disc) **Supplier** Interceptor Micros, Lindon House, The Green, Tadley, Hants.

Speech without any extra hardware is promised by *Tales of the Arabian Nights* from Interceptor Micros.

As soon as the program has loaded the computerised voice makes itself heard. Admittedly it sounds like a Dalek with its mouth full of porridge, but with a little concentration you can make out what it is saying.

The voice speaks again at

the start of each level of this addictive arcade game. The plot concerns one Prince Imrahil, whose quest is to rescue Princess Amitra from the clutches of the evil Sultan Saladin. To achieve his goal, he



Bolts of laser

Program *Megagalactic Llamas Battle at the Edge of Time Micro* Commodore 64 **Price** £5.50 **Supplier** Llamasoft, 49 Mount Pleasant, Tadley, Hants.

The longest game title ever seen must surely be *Megagalactic Llamas Battle at the Edge of Time*. No prizes for guessing this comes from Llamasoft.

It's actually a conversion of an expanded Vic20 game which Llamasoft put out some time ago. So it's not surprising to find that it has only a single screen of action.

This follows the pattern familiar from other Llamasoft offerings — what Jeff Minter likes to call "a fast blast". In this case, you control a llama which finds itself under attack from mutant

spiders. These descend on webs, which eventually break dropping the spider to the ground, whereupon it advances towards the llama, destroying it if it makes contact. The llama defends itself by spitting bolts of laser energy, these destroy the spiders and their webs. However, to make it more difficult, in order to hit the grounded spiders, the laser bolts must be bounced off a force field above the llama.

Despite the bizarre plot and simple action, this game is great. Jeff Minter long ago figured out how to write fun fast action games, and this one is well up to the usual standard, and only £5.50. The graphics and sound, although apparently quite simple, are also very effective.

Richard Corfield

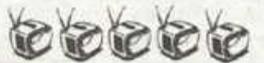


desert by magic carpet. He then reaches the Sultan's Palace where he must avoid the guards and find his way through the Palace and its garden before he can free the Princess. They then make good their escape by magic carpet — all good Arabian Nights stuff.

It's original, challenging and very compulsive. The colourful and interesting graphics are of high quality, and the music track is exceptionally good — a very accurate version of *Scheherazade* by Rimsky-Korsakov.

In fact, this is one of the best games for the Commodore 64 I have seen for ages.

Richard Corfield



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No strings attached

Alan McDonald takes a look at input and string manipulation in Part 3 of his adventure series

This week we shall take a look at input and string manipulation.

The Input routine

An effective input routine must do the following things:

- 1) Allow characters to be entered from the keyboard
- 2) Print what is being typed to the screen and store the information into a buffer
- 3) Allow typing mistakes to be corrected (Deleted)
- 4) Check to see if the Enter key is being pressed

A buffer is created (T-Buff) which is used to store the data being typed in.

The maximum amount of data that can be entered into the adventure game is 32 characters. This can be changed to a maximum of 255 by changing the following lines in the assembly listing. 3130 DEFS 32 DEFS amount, also change line 3530 to the required amount. (The scan routine will also need to be altered.)

A routine will need to check for valid key presses, in the range of 33 to 127. Study this week's assembler listing and examine the input routine. When the input routine is run a cursor will be printed to the screen at all times. It only disappears once Enter has been pressed.

To check for a key depression we use a routine similar to this:

```
LD A,204 ; equivalent of PAUSE 0
LD (23611),A ; in BASIC
CHECK LD A,(23611)
CP 204
JR Z,CHECK
LD A,(23560)
```

23611 is the system variable FLAGS whilst 23560 is the system variable LAST K.

Note: When the input routine is used characters may be deleted by pressing Delete (Caps shift + 0) or simply 0 on its own. Also note, it is possible to delete a whole line by pressing the Edit key (Caps shift + 1).

String manipulation

If you examine this week's assembly listing, you will find a section of code labeled 'Scan routine'.

What this does is to search through the buffer (T-BUFF) looking for a string of characters. As an example, let's imagine that we want to see if the buffer contained the word Adventure. We would do the following steps:

```
21 DEFM "ADVENTURE" ; the string 9 characters
; long plus a space
LD HL,Z1 ; HL register pair points to
; the string
LDB,10 ; B register holds the length
; of the string
CALL FIND ; call the find routine
JP Z,FOUND ; if a match is made then
; jump to the routine found
```

If you have not already noticed, this week's assembler listing is divided into two

parts:

- 1) Part one lines 3030 to 4720
- 2) Part two lines 9080 to 10510

Part one contains the input and scan routines, whilst part two forms the main execution loop of the program. If you study it closely, you will notice that it calls non-existent routines. These routines will be given in future issues.

As another example, let's imagine that we wanted to search for the word Look. As you know in an adventure game, the word Look has the effect of redesccribing the current location. All we need to do is call the print location routine once the word Look or its abbreviation L have been typed in.

Here it is in Assembly format:

```
23 DEFM "L" ; the word 'L' is separated
; by 2 spaces.
23 DEFM "LOOK"
LD HL,Z3
CALL THREE ; 3 characters long
JP Z,PLOC ; if found jump to PLOC
LD HL,Z3
CALL FIVE ; 5 characters long
JP Z,PLOC ; if found jump to PLOC
```

Since most words in an adventure game are only three, four or five characters long, I have written small routines which save you from loading B with the length of the string. If length of string is three then:

CALL THREE

If it's four then:

CALL FOUR

and if it's five:

CALL FIVE

However, any other lengths are handled by:

LD B, length followed by CALL FIND

Next week we shall look at the Get, Drop and Inventory routines.

```
3030 : Input routine:
3031 :
3032 : A buffer is created
3033 : which stores the
3034 : information being
3035 : typed in.
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```

Safely saved

Frances Cameron shows you how to verify your microdrive programs

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```
save mdv1-progname
```

```
copy mdv1-progname to mdv2-progname
```

```
copy mdv2-progname to scr
```

and a screen Listing will show up in green ink on black paper. (Yes, do type in "scr".

It's quite correct.)

As you can see, there is only one real *Save*. When you copy this from mdv1 to mdv2, it's like doing a *Verify*. You won't get a copy unless there's been a good save. Copying from mdv2 to the screen is a double-check—and it takes very little time. There's no need to wait for the red light to go out before typing in the next instruction. The cursor stops flashing when the computer is busy so, as soon as the cursor re-appears, it is safe to type in and *Enter* the next command.

Here's a short program to try it out on. It doesn't do very much, but it's fun to watch and it'll go on quite happily on *F2 TV* until you've had enough. You can *Break* to finish.

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When you've typed this in, just *Save* to mdv1. Then *Copy* from mdv1 to mdv2 and, for a final conformation, *Copy* from mdv2 to the screen. If you don't want to keep both copies, then *Delete* one of them in the usual way.

```
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110 REMark      "sunburst"
120 REMark =====
130 CLS#0 : CLS#2
140 PAPER 0 : CLS
150 REPEAT sunburst
160   BORDER 6, RND(255)
170   INK RND(1 TO 7)
180   LINE 80,60 TO RND(170),RND(100)
190   BEEP 165, RND(20)
200 END REPEAT sunburst
210 REMark =====
220 REMark copyright francis cameron
230 REMark      11 june 1984
240 REMark =====
```

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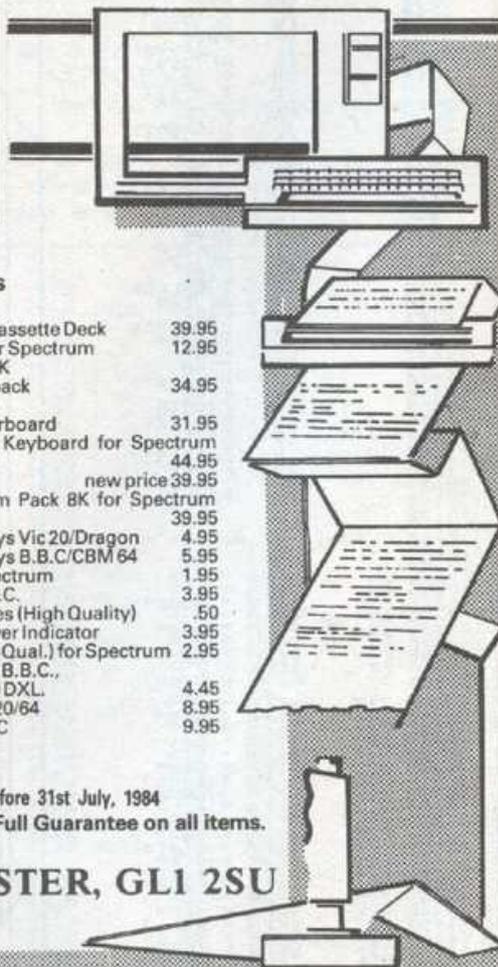
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200 END REPEAT sunburst
210 REMark =====
220 REMark copyright francis cameron
230 REMark      11 june 1984
240 REMark =====
```

All clear for take-off

Jason Orbaum and Geoffrey Campbell continue their series on assembly programming

When we finished last week you should have had a general idea of the structure and flow of the program. This week sees the first part of the program presented, with another flowchart. This shows the theory put into practice to produce a simple, yet addictive, game.

The first commands of the program are known as *Assembler Directives*, they tell the assembler to do something, and are not part of the program. The *EQU* command here is used to set a *Constant*. To take the first line as an example, whenever the word *Score* is found, the number substituted will be decimal 2000. This is an address halfway down graphics page one. Unless the program is to use the Hi-Res pages (which this one does not), they are an ideal place to store numbers because the Dragon does not change them under normal circumstances.

You will have noticed that a gap of two addresses is left between *Score* and *Flag* whilst a gap of one is left between *Flag* and *Ship*. This is because *Flag* needs to be only a one-byte number as it will only contain a number in the page 0 to 255. *Score*, however, may contain numbers higher than this (depending on the player!) and so

needs to be a two-byte number.

START OF GAME

This initialises variables that must not be reset at the beginning of each wave. It does so by loading a register with the number to be stored and then storing it at the appropriate address.

START OF WAVE

This sets up the variables that have to be reset every wave (namely the *Flag* and the position of the plane). Routine *CL80* stores a character 128 (black square) in every location on the text screen, and in so doing clears it. Make sure that you understand how the loop is working as this routine is a good example of a *Block* fill routine (ie, a routine that fills a block of memory with a set value).

PUT UP BUILDINGS

This is possibly the most complicated routine that we will look at this week which is why it has a separate flowchart.

Having erected the buildings, we come to

the beginning of the main program (labelled *Move*). The first thing that this routine does is to check to see if the plane has reached the bottom-right of the screen, and if it has, control goes to *Fin* (covered next week). The program adds one to the plane position, so moving it along and down the screen, and looks to see what is in the new position. If it is a black space (ie, it is not a building) then the program branches on to the *Move Bomb* routine at *Past 1*.

CRASHED

If, however, the program finds something at the location then the plane has crashed and the program must notify the user. The subroutines called by this routine will be covered in detail next week but, in brief, they invert the screen, make a crashing sound, re-invert the screen, remove any green squares (for reasons covered next week), make another crashing sound, and print the score respectively.

The next few lines utilise one of the more useful ROM routines, jumping to the subroutine at hex 8006 (\$8006) polls the keyboard and returns the ASCII code of the character being pressed in accumulator A. If this is zero (ie, no key pressed) then the program re-polls the keyboard until a key is pressed. When a key is pressed, the program checks to see if it is an apostrophe and if it is then the program ends, otherwise it re-starts.

The Basic equivalent of this routine is as follows:

1F41	*			1F6A	*			1FB9	170141	LBSR	INV		
1F41	*	BLITZ V2.0		1F6A	108E001D	LDY	#29	1FBC	170157	LBSR	GREEN		
1F41	*			1F6E	B60113	LOOP4	LDA	#113	1FBF	17010C	LBSR	RANG	
1F41	*	G. CAMPBELL		1F71	8403		AND	#3	1FC2	1701FD	LBSR	SCR	
1F41	*	& J. ORBAUM		1F73	3402		PSHS	A	1FC5	B08006	LOOP3	JSR	\$8006
1F41	*			1F75	C610		LDR	#16	1FC8	27FB		BEQ	LOOP3
1F41	*	(c) 24/12/1983		1F77	3D		MUL		1FCA	0127		CMPA	#39
1F41	*			1F78	CB8F		ADDB	#143	1FCC	1026FF71		LBNE	BEGIN1
1F41	07D0	SCORE EQU	2000	1F7A	3502		PHI	A	1FD0	39		RTS	
1F41	07D2	FLAG EQU	2002	1F7C	BB07D9		ADDA	INC	1FD1		*		
1F41	07D3	SHIP EQU	2003	1F7F	8E05FF		LDX	##5FF	1FD1		*	MOVE	BOMB
1F41	07D5	BPOS EQU	2005	1F82	3420		PSHS	Y	1FD1		*		
1F41	07D7	WAVE EQU	2007	1F84	301F	DLOOP	LEAX	-1,X	1FD1	B607D2	PAST1	LDA	FLAG
1F41	07D9	INC EQU	2009	1F86	313F		LEAY	-1,Y	1FD4	0101		CMPA	#1
1F41	07DA	LINE EQU	2010	1F88	26FA		BNE	DLOOP	1FD6	263B		BNE	PAST2
1F41	*			1F8A	3520		PULS	Y	1FD8	BE07D5		LDX	BPOS
1F41	*	START OF GAME		1F8C	E784	LOOP2	STB	.X	1FD8	308820		LEAX	32.X
1F41	*			1F8E	3088E0		LEAX	-32,X	1FE	BF07D5		STX	BPOS
1F41	CC0901	BEGIN1 LDD	##901	1F91	4A		DECA		1FE1	A684		LDA	.X
1F44	FD07D7	STD	NAVE	1F92	26F8		BNE	LOOP2	1FE3	8180		CMPA	#128
1F47	8601	LDA	#1	1F94	170137		LBSR	RANG	1FE5	2709		BEQ	PAST4
1F49	B707D9	STA	TNC	1F97	170126		LBSR	PAUSE	1FE7	FC07D0		LDD	SCORE
1F4C	CC0000	LDD	#0	1F9A	313F		LEAY	-1,Y	1FEA	C30001		ADD	#1
1F4F	FD07D0	STD	SCORE	1F9C	26D0		RNF	LOOP4	1FED	FD07D0		STD	SCORE
1F52	*			1F9E	BE07D3	MOVE	LDX	SHIP	1FF0	BE07D5	PAST4	LDX	BPOS
1F52	*	START OF WAVE		1FA1	8C05FF		CMPX	##5FF	1FF3	862A		LDA	#42
1F52	*			1FA4	102701CD		LBEQ	FIN	1FF5	A784		STA	.X
1F52	8600	BEGIN LDA	#0	1FA8	3001		LEAX	1,X	1FF7	8630		LDA	#128
1F54	B707D2	STA	FLAG	1FAA	BF07D3		STX	SHIP	1FF9	3088E0		LEAX	-32,X
1F57	CC0403	LDD	##403	1FAD	A684		LDA	.X	1FFC	A784		STA	.X
1F5A	FD07D3	STD	SHIP	1FAF	8180		CMPA	#128	1FFE	FC07D5		LDD	BPOS
1F5b	8E0400	CLS0 LDX	##400	1FB1	271E		RFA	PAST1	2001	108305E		CMPD	#1505
1F60	CC0000	LDD	##0000	1FB3		*			2005	250C		BLO	PAST2
1F63	ED81	LOOP1 STD	.X++	1FB3		*	CRASHED!!!		2007	8600		LDA	#0
1F65	8C0600	CMPX	##600	1FB3		*			2009	B707D2		STA	FLAG
1F68	25F9	BLO	LOOP1	1FB3	170147		LBSR	INV	200C	BE07D5		LDX	BPOS
1F6A	*			1FB6	170115		LBSR	RANG					
1F6A	*	PUT UP BUILDINGS											

```
10 AS=INKEYS: IF AS="" THEN GOTO 10
20 IF AS="," THEN END ELSE RUN
```

You will see the routine used a lot in the series, and also a variant of it covered later on in *Scan Keyboard*.

MOVE BOMB

The first thing that this routine does is check whether or not a bomb is in the air by looking at the contents of FLAG. A flag is simply a variable that is set (greater than 0) when a condition is satisfied, ie, a bomb is dropping, and is clear (0) when the condition is not satisfied.

If a bomb is dropping, then 32 is added to its position (ie, it moves down one line) and the contents of the new position are checked. If the space is not blank then the score has one added to it. At PAST4 the bomb is plotted at its new position, and the old one is then plotted over with a black square. The program does not do it in this order for convenience, but to produce a flicker-free image.

At address \$1FFE the program checks to see whether the bomb has reached the bottom of the screen. If it has, then the flag is cleared, and the bomb erased.

SCAN KEYBOARD

Here is the aforementioned variation on the earlier routine. Suffice it to say that the first six lines clear the buffers so that auto-repeat is achieved, then the keyboard is rolled and

if nothing has been pressed, the program branches to NOPRES, where a pause is executed. This pause takes as much time as the ROM routine takes if a key is pressed. This ensures that the plane does not slow down when a key is pressed.

If a key has been pressed, then a check is made to see if a bomb is dropping and if one is not, then a new bomb is released with a zapping sound (LBSR ZAP).

At NOKEY the plane is re-plotted. The end character is a space so that the plane erases itself. A call is next made to HUMM which, as its name suggests, hums for a length proportional to the contents of wave (so that the hum rises in pitch as the game progresses and gets faster).

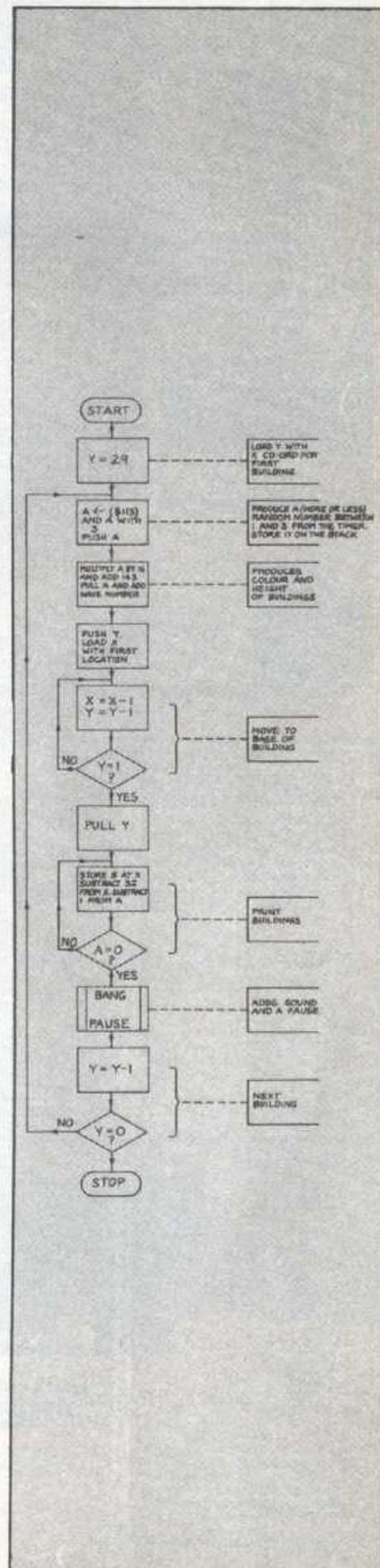
If the contents of wave are greater than three, and the contents of the timer (one way of achieving a pseudo-random number between 0 and 255) is less than the height of the green buildings (INC), the program scrolls the buildings; otherwise control is returned to Move.

SCROLL BUILDINGS

This routine scrolls the buildings upwards. It offers samples of two routines, a block move, and a block copy (although the latter is not necessary for the program).

A detailed description of their workings, along with the workings of the subroutines, the subroutines themselves, and a Basic loader for the program will be given next week.

200F 8680	LDA	#128	206A	?		
2011 A784	STA	.X	206A	?	SCROLL BUILDINGS	
2013	*		206A	?		
2013	*	SCAN KEYBOARD	206A 8600	LDA	#0	
2013	*		206C B707DA	STA	I.TNF	
2013 C0FFFF	PAST2	LDD	#FFFFF	206F FC07D3	LDD	SHIP
2016 FD0150	STD	\$15A	2072 830020	FIND	SUBD	#32
2019 FD0152	STD	\$152	2075 10830400	CMPI	#1024	
201C FD0154	STD	\$154	2079 2505	RI	FPAST	
201F FD0156	STD	\$156	207B 7C07DA	INC	LINE	
2022 FD0158	STD	\$158	207E 20F2	BRA	FIND	
2025 ED0006	ISR	\$0006	2080 7C07DA	FPAST	INC	LINE
2028 1027013E	LBEO	NOPRES	2083 B607DA	LDA	I.TNF	
202C B607D2	LDA	FLAG	2086 108E0420	LDY	#1056	
202F 8101	CMPI	#1	208A 8E0400	LDX	#1024	
2031 2711	BEQ	NOKEY	208D 308820	FPLOOF		
2033 17015A	LBSR	ZAP	20A7 EC81	LEAX	32.X	
2036 8601	LDA	#1	2090 31A820	LEAY	32.Y	
2038 B707D2	STA	FLAG	2093 4A	DECA		
203B FC07D3	LDD	SHIP	2094 26F7	BNE	FPLOOF	
203E 830001	SUBD	#1	2096 ECA1	SCRLOP		
2041 FD07D5	STD	RPAS		LDD	.Y++	
2044 BE07D3	NOKEY	LDX	SHIP	STD	.X++	
2047 301E	LEAX	-2.X	2098 ED81	CMPI	##600	
2049 8680	LDA	#128	209A 108C0600	BLO	SCRLOP	
204B A780	STA	.X+	209E 25F6	LDX	#1472	
204D 863D	LDA	#61	20A0 8E05C0	LDY	#1504	
204F A780	STA	.X+	20A3 108E05E0	COPY		
2051 4C	INCA		20A7 EC81	LDD	.X++	
2052 A784	STA	.X	20A9 EDA1	STD	.Y++	
2054 1700D2	LBSR	HUMM	20AB 108C0600	CMPI	##600	
2057 B607D9	LDA	INC	20AF 25F6	BLO	COPY	
205A 8103	CMPI	#3	20B1 BE07D5	LDX	BPOS	
205C 1025FF3E	LBI	MOVE	20B4 3088E0	LEAX	-32.X	
2060 B60113	LDA	\$113	20B7 BF07D5	STX	BPOS	
2063 B107D9	CMPI	INC	20BA 170011	LBSR	BANG	
2066 1022FF34	LBHI	MOVE	20BD 16FEDE	LBRA	MOVE	



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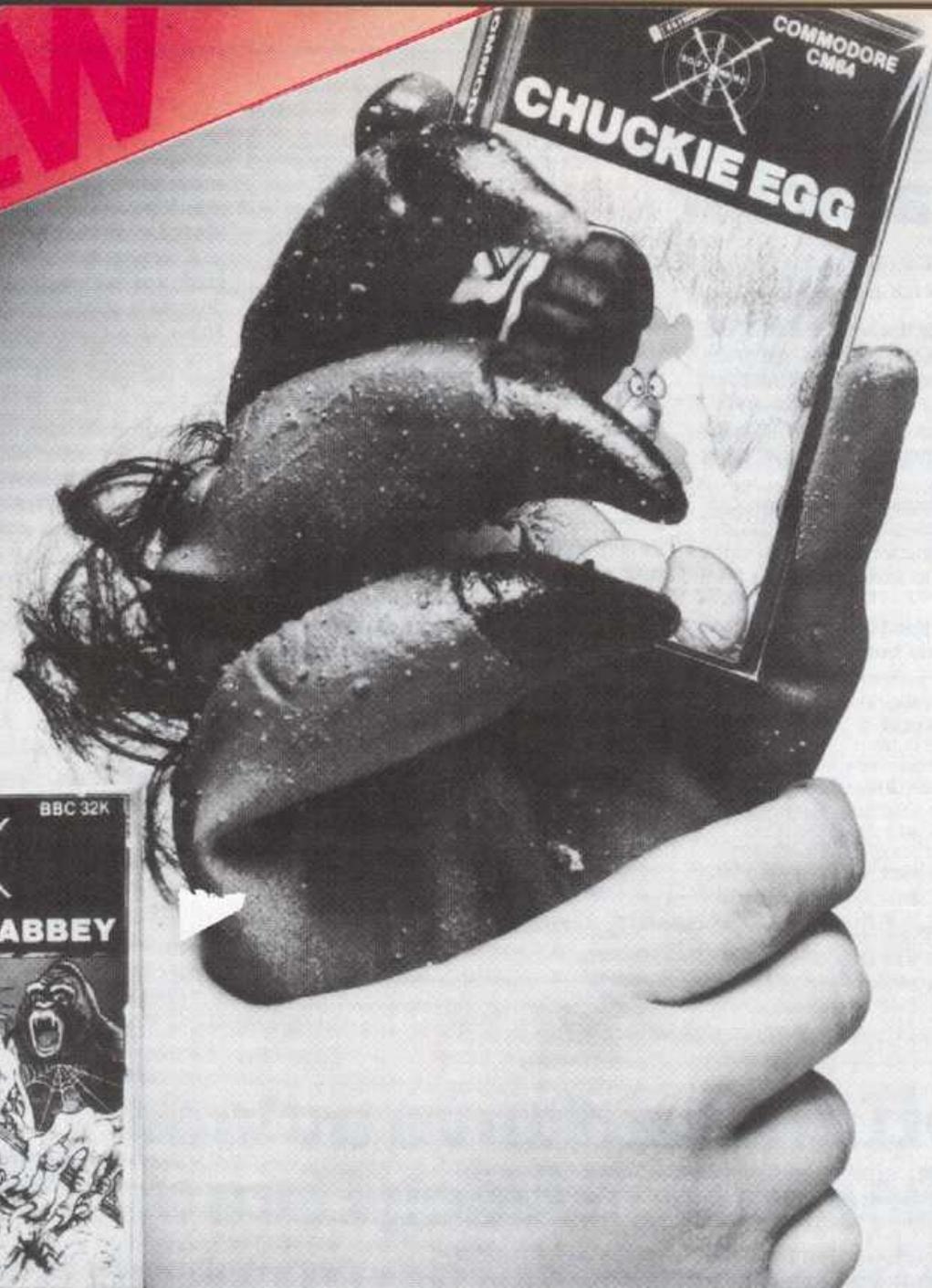


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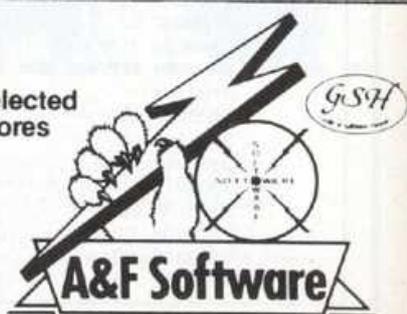
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In character

Mark Lawrence completes his two-part machine-code graphics utility for the BBC

Before you type in the second part of this graphics character design program, load in the first part of the listing, printed last week.

Before loading in part one switch the machine off and then on, and then enter `page=page+3000`.

The program allows you to design characters, rotate them clockwise by 90 degrees, flop the character from left to right, scroll it, invert it and save and load it from tape.

When you have typed in both parts of the listing save the code before attempting to

run it.

Now run the program and if it assembles correctly save the code by entering *Save &EOO. If you have typed it in correctly you should see an 8x8 grid, the user definable graphics set and a menu. The user definable graphics characters are printed alongside the grid, but since they are usually undefined when you first switch on it may appear that there is nothing there.

The menu lists the keys to be used. If you press Q or P (to store your design or pick up a character) the message 'which Character'

will appear. The characters are numbered from 1 to 9 and A to W inclusive so character 224 is 1, character 225 is 2 and character 233 is A. Pressing S or L will save or load the complete set of characters. To use your designs in your own program enter *load"" either as a direct command or as part of your program. This will load your designs into the character area. To print your character use `Print N, Chrs(x)` where x is the character code, ranging from 224 to 255. If you are not sure which character code applies to your design enter `For N=224 TO 255:Print N, Chrs(N):Next N`. This will print out the characters with the relevant code alongside.

In addition to the keys listed in the menu, pressing escape will return you to Basic. Enter `Call &EOO` to return to the program.

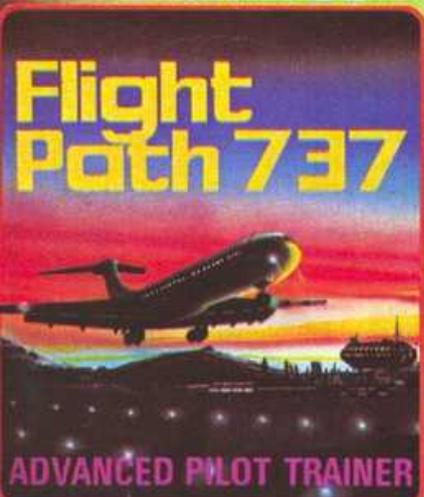
```

2990CPX #4
3000BEQ NOUP
3010JSR PLUP
3020DEC X1
3030.NOUP RTS
3040.DO LDX X1
3050CPX #13
3060BEQ NODO
3070JSR PLUP
3080INC X1
3090.NODO RTS
3100.LE LDY Y1
3110CPY #3
3120BEQ NOLE
3130JSR PLUP
3140DEC Y1
3150.NOLE RTS
3160.RI LDY Y1
3170CPY #12
3180BEQ NORI
3190JSR PLUP
3200INC Y1
3210.NORI RTS
3220.PSUB JSR SWAP
3230LDX #5
3240.L2 LDY #11
3250.L1 JSR AT
3260TXA
3270PHA
3280TYA
3290PHA
3300LDA #135
3310JSR &FFF4
3320CPX #132
3330CLC
3340BNE 04
3350SEC
3360.04 ROR TEMP+8
3370PLA
3380TAY
3390PLA
3400TAX
3410DEY
3420CPY #3
3430BNE L1
3440LDA TEMP+8
3450STA TEMP-5,X
3460INX
3470CPX #13
3480BNE L2
3490JSR SWAP
3500RTS
3510.AD LDX #9
3520LDA TEMP+8,X
3530JSR &FFEE
3540DEX
3550BNE AD+2
3560JSR CHAR
3570JSR &FFEE0
3580CLC
3590SBC #48
3600CLC
3610CMP #10
3620BMI OK
3630CLC
3640SBC #6
3650.OK CLC
3660ASL A
3670ASL A
3680ASL A
3690RTS
3700.PUT JSR PSUB
3710JSR AD
3720STA LB+1
3730LDX #0
3740LDA TEMP,X
3750.LB STA &C00,X
3760INX
3770CPX #8
3780BNE LB-3
3790JSR SET
3800RTS
3810.INVERT JSR SWAP
3820LDX #5
3830LDY #4
3840.LL JSR AT
3850TXA
3860PHA
3870TYA
3880PHA
3890LDA #135
3900JSR &FFF4
3910LDA #224
3920CPX #128
3930BNE 01
3940LDA #228
3950.01 JSR &FFEE
3960PLA
3970TAY
3980PLA
3990TAX
4000INY
4010CPY #12
4020BNE IL
4030INX
4040CPX #13 4050BNE INVERT+5
4060JSR SWAP
4070RTS
4080.GSUB JSR SWAP
4090LDX #5
4100LDY #11 4110JSR AT
4120LDA #224 4130LSR TEMP-5,X
4140BCC 00
4150LDA #228
4160.GO JSR &FFEE
4170DEY
4180CPY #3
4190BNE GSUB+7
4200INX
4210CPX #13
4220BNE GSUB+5
4230JSR SWAP
4240RTS
4250.PICK JSR AD
4260STA PLB+1
4270LDX #0
4280.PLB LDA &C00,X
4290STA TEMP,X
4300INX
4310CPX #8
4320BNE PLB
4330JSR SET
4340JSR GSUB
4350RTS
4360.UPS JSR PSUB
4370LDY TEMP
4380LDX #0
4390LDA TEMP+1,X
4400STA TEMP,X
4410INX
4420CPX #2
4430BNE UPS+8
4440STY TEMP+7
4450JSR GSUB
4460RTS
4470.DOS JSR PSUB
4480LDY TEMP+7
4490LDX #7
4500LDA TEMP-1,X
4510STA TEMP,X
4520DEX
4530BNE DOS+8
4540STY TEMP
4550JSR GSUB
4560RTS
4570.LS JSR PSUB
4580LDX #8
4590LDA TEMP-1,X
4600ASL A
4610ROL TEMP-1,X
4620DEX
4630BNE LS+5
4640JSR GSUB
4650RTS
4660.RS JSR PSUB
4670LDX #8
4680LDA TEMP-1,X
4690LSR A

```


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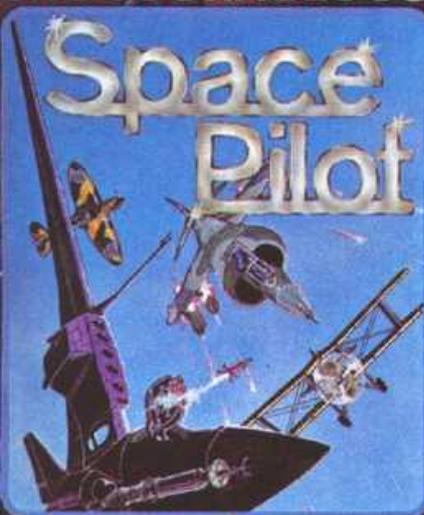


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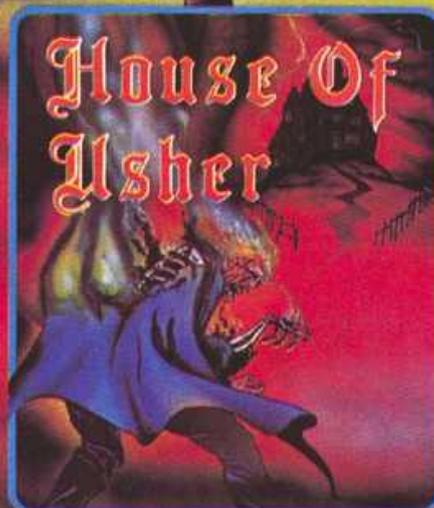
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Cryptic codes

Protect your messages from prying eyes with Peter Bilbrough's program for producing secret codes

Considerable interest has been shown recently in using home computers to encipher or decipher information, either for amusement or to safeguard data.

Often the ciphers proposed are too simple to deserve serious attention. At the other extreme some methods offering great security have been suggested which are so complex as to be beyond the scope of the average home micro.

The program here has been designed to avoid the pitfalls of both extremes. It was written for the Commodore 64 but can be adapted to run on other machines. If properly used then it has the potential to provide what is arguably an absolute level of cryptographic security.

The program is broken into clear sub-routines which are each given Rem statements to identify their purpose. But before describing getting into the program it may be worth giving some background information on cryptology.

Any code considered for serious use should meet certain criteria.

- 1) The system should be materially, if not mathematically, indecipherable.
- 2) It should lend itself to automatic encipherment.
- 3) The resultant code — called the ciphertext — should not be unduly longer than the original plain text.
- 4) Any key used must be one which is easily remembered and flexible enough to be changed at will.
- 5) The cipher must be easy to operate.
- 6) It must not be liable to produce errors or unduly aggravate any errors which do arise.
- 7) The system must be so designed that knowledge of the program will not automatically compromise the cipher.

There are two ways of enciphering, sometimes both being applied in conjunction: Transposition — where the letters remain the same but their positions are

changed; and substitution — where the position of the letters remains the same but the letters themselves are replaced with others.

The PCW program incorporates substitution ciphers. Single alphabet substitution gives very little security so most substitution ciphers use some form of key. This is repeated along the length of the plaintext. The product of each key letter and text letter, calculated by one of several methods, becomes the cipher letter. This system is called 'Polyalphabetic'.

This type of code has one serious weakness — if the key is of finite length then, when the same letters of the plaintext are enciphered by the same length of the key, that part of the resulting ciphertext will also repeat. This gives clues as to keyword length and often results in discovery of the key.

Obviously, the security of the system will usually increase with the key length. Indeed the more complex polyalphabetic substitution ciphers include a means of suppressing this repetition.

The listing given here was a combination of two of these more advanced methods — interrupted key and aperiodic key and this is what gives this cipher its great security.

An aperiodic key is used to re-encipher the text obtained from the first enciphering method. Ideally this key should be completely random but this is not really feasible for home computers. An effective option and can be achieved by pseudo-random generation.

The plaintext is first enciphered by using an interrupted keyword. The keyword returns to the start when its letters are used up, as with the more simple methods. But it also returns when it meets a letter chosen by the user. This second 'random' return, based solely on the plaintext makes it a very secure cipher.

The method of operation has been kept simple. A keyword and interrupter letter

are fed into the computer for the first stage encipherment. A seed number is then chosen. This will be used to produce a sequence of letters for the re-encipherment which repeats identically whenever a particular number is selected but which is individual to that number. Not only does the use of a seed give access to almost unlimited combinations but it does away with the need to store random characters for feeding into the computer.

The program will put into code up to 250 characters. Each new text or block of 250 characters will need a new seed number if full security is to be maintained. Having said this, even the repeated use of sequences using the same 'seed' will still give a good degree of security.

One advantage of using keywords as well as seed numbers in encryption is that the need to repeat the seed is greatly reduced. People having different keys could use the same seed number and yet would produce completely different ciphertext results.

Not counting the time necessary to input the text, it takes nearly two minutes to encipher or decipher the full 250 characters. This compares favourably with about 270 characters dealt with in the same time by conventional electrical cryptographic machines.

Mention should be made of the use of the letter 'X'. This is generated in enciphering each time the space bar is hit when typing in the plain-text. When the text is deciphered it is converted back into a space. In this way the plain-text is reproduced word by word rather than in a continuous line or blocks of five. Obviously the letter will also be used as a normal character in some words — in which case it will be left out in the deciphering. However, it only appears on average twice in 1,000 characters and the message should still remain intelligible. As an alternative the letters 'ks' could be used, ie, toxic would become toksic.

To give some idea of the security of the program two blocks of coded text are shown. The letter X was used throughout with the seed numbers. 1.00000001 for Block One and 1.00000002 for Block Two. To show encryption as a 'worst case' the codeword chosen was XXXXX and the interrupter letter A.

Block 1

```
HQHUR F5CEP IYMQH QNOFW SAQCK PNMLP LIRHV JJRNM LQFJM SZMIM SLQPK WQCCM DHPTP  
TPLLHVUR MPQTM FNEOQ QYHAK CMWMP ACEPEJ VROHQ VUPHG JVPIA GORHP CKQLD ZQFQM  
MZWFYL PIYJB IQPOQ GVYYQ GWTCM CUEON IPJYK KEJHO ISCXM JGFRE LMSXW CDKZE AASLO  
KFO5IQRDFV LDJFE XSROO ZWZLE AWJCS HNFHQ LWYXK PHRKH QZRM
```

Block 2

```
HSNLM JKCWD QPAAH QFZVI PNEYH NJKXL FADEE HLAOP ORPZQ BNHBU AHNPY DMPUF ARGSTCG  
DHH WKPIF ZPQGN RNBVI QOERN OLXBK KKOVK APECM VOZEF WVNMR SHGSB HVPUH CDLWEXWE  
F MXZZA GLCPH SQRKZ QAPEP LMZYR FIXNW QNKQH FSOBM IIDHV VMOSO LQSDK SMHFI RDWUD  
HRSEF OBHGS XJRXO LEZOZ NLQFP FFYKM OFIDU EGLRR NXBKM REWYQ
```

```

10 REM *****
20 REM *SUPERENCIPHERED INTERRUPTED*
30 REM * PERIODIC KEY CIPHER *
40 REM * BY *
50 REM * PETER J BILBROUGH *
60 REM * JULY 1984 *
70 REM *****
80 REM *****
90 POKES3280,0:POKES3281,0
100 PRINT CHR$(147)
110 PRINTTAB(8) "*****DATA SECURITY
PROGRAMME"
120 PRINTTAB(12) "*****DO YOU WISH TO -"
130 PRINTTAB(12) "M1. ENCRYPTER TEXT"
140 PRINTTAB(12) "M2. DECRYPTER TEXT"
150 PRINTTAB(12) "M3. END PROGRAMME"
160 PRINTTAB(12) "*****SELECT NUMBER*"
170 GET# : IF#="" THEN170
180 IF#="1" THEN510
190 IF#="2" THEN1010
200 IF#="3" THENGOSUB5010:GOTO170
210 END
500 REM ***INPUT PLAINTEXT***
510 GOSUB2010
520 PRINT"TYPE UPTO",W;"CHARACTERS OF
PLAINTEXT."
530 PRINT"ALWAYS END BELOW A MARKER,
USE SPACE"
540 PRINT"BAR BETWEEN WORDS AND TO
REACH MARKERS."
550 PRINT"AUDIBLE WARNING IS GIVEN 5
CHARACTERS"
560 PRINT"BEFORE MAXIMUM PERMITTED TEXT
LENGTH."
570 PRINT " | | | | |
| | | | |
| | | | |
580 GET# : IF#="" THEN580
590 IF#="" THENG#="X"
600 G=ASC(G#)
610 IFG>47ANDG<58ORG<64ANDG<91THENM#4
=M#4+G# : PRINTG# : L=L+1
620 IFG=20ANDL=0THENPRINTG# : L=L-1
M#4=LEFT$(M#4,L)
630 IFG<58ANDLEN(M#4)=4-5THENGOSUB6010
640 IFG=13ANDLEN(M#4)/5<INT(LEN(M#4)/5)
THENGOSUB5010 :GOTO500
650 IFG<13ANDL<0THEN500
660 PRINT"*****THE TEXT IS
NOW BEING ENCRYPTED"
670 GOTO3010
1000 REM ***INPUT CIPHERTEXT***
1010 GOSUB2010
1020 PRINT"TYPE UPTO",W;"CHARACTERS
OF CIPHERTEXT."
1030 PRINT"WITHOUT SPACING, ALWAYS
END BELOW A"
1040 PRINT"MARKER, AUDIBLE WARNING
IS GIVEN 5"
1050 PRINT"CHARACTERS BEFORE MAXIMUM
PERMITTED"
1060 PRINT"TEXT LENGTH."
1070 PRINT " | | | | |
| | | | |
| | | | |
1080 GET# : IF#="" THEN1080
1090 G=ASC(G#)
1100 IFG>47ANDG<58ORG<64ANDG<91THENM#4
=M#4+G# : PRINTG# : L=L+1
1110 IFG=20ANDL=0THENPRINTG# : L=L-1
M#4=LEFT$(M#4,L)
1120 IFG<58ANDLEN(M#4)=4-5THENGOSUB6010
1130 IFG=13ANDLEN(M#4)/5<INT(LEN(M#4)
/5)THENGOSUB5010 :GOTO1000
1140 IFG<13ANDL<0THEN1000
1150 PRINT"*****THE TEXT IS
NOW BEING DECRYPTED"
1160 GOTO4010
2000 REM ***CALCULATION OF KEY***
2010 PRINTCHR$(147)
2020 PRINT"GIVE DESIRED TEXT LENGTH
IN MULTIPLES"
2030 PRINT"OF FIVE (NOT TO EXCEED
250 CHARACTERS)."
2040 INPUTW
2050 IFW<250THENPRINT"IT" :GOSUB5010
:GOTO2040
2060 IFW<5<INT(W/5)THENPRINT"IT"
GOSUB5010:GOTO2040
2070 PRINT"*****INPUT A KEY OF AT LEAST
FIVE CHARACTERS"
2080 PRINT"IN LENGTH (USING NO SPACES),
IT WILL BE"
2090 PRINT"USED FOR FIRST STAGE TEXT
ENCIPHERMENT."
2095 INPUTQ#
2100 IFLEN(Q#)<5THENPRINT"IT" :GOSUB5010
:GOTO2095
2110 PRINT"*****INPUT A LETTER, PREFERABLY-
A,E,I,N,O,R."
2120 PRINT"S OR T, IT WILL BE USED
TO GENERATE"
2130 PRINT"RANDOM REPETITION OF THE KEY
BASED ON THE"
2140 PRINT"CONTENTS OF THE PLAINTEXT."
2150 INPUTK#
2160 IFLEN(K#)>1THENPRINT"IT" :GOSUB5010
:GOTO2150
2170 PRINT"*****INPUT A NUMBER UPTO 9
DIGITS LONG, IT"
2180 PRINT"WILL BE USED TO SUPERENCIPHER
THE FIRST"
2190 PRINT"STAGE ENCIPHERMENT PRODUCED
BY THE KEY"
2200 PRINT"TYPED IN EARLIER."
2210 INPUTR
2220 IFR>20THENR=SQR(R)+ABS(SIN(R))
:GOTO2220
2230 PRINT CHR$(147)
2240 DIMS$(255)
2250 PRINT"*****CALCULATING
SUPERENCIPHERMENT SEQUENCE" :PRINT
2260 FORZ=1TOW
2270 R=((e+R)/15)-INT((e+R)/15)
2280 V=INT(R*100)
2290 IFV>90THENV=V-10
2300 IFV<65THENV=V+25 :GOTO2300
2310 S(Z)=CHR$(V)
2320 PRINTCHR$(V)
2330 C#=C#+S#(Z)
2340 NEXTZ
2350 FORA=0TOW50 :NEXT
2360 PRINTCHR$(147) :RETURN
3000 REM ***ENCIPHERING***
3010 P=P+1 : IFP>LEN(Q#)THENP=1
3020 IF#="K"THENP=1
3030 M=M+1
3040 IFM>LEN(M#4)THEN3160
3050 F=MID$(M#4,M,1)
3060 F=ASC(F#)
3070 IFF<65THEN3120
3080 F=F+ASC(MID$(Q#,P,1))-65
3090 IFF>90THENF=F-26
3100 CD#=CD#+CHR$(F)
3110 GOTO3010
3120 F=F+ASC(MID$(Q#,P,1))-48
3130 IFF>57THENF=F-10 :GOTO3130
3140 CD#=CD#+CHR$(F)
3150 GOTO3010
3160 P=P+1 : M=M+1
3170 P=P+1 : M=M+1
3180 IFM>LEN(CD#)THEN3300
3190 FF=MID$(CD#,M,1)
3200 FF=ASC(FF#)
3210 IFFF<65THEN3260
3220 FF=FF+ASC(MID$(Q#,P,1))-65
3230 IFFF>90THENFF=FF-26
3240 CV#=CV#+CHR$(FF)
3250 GOTO3170
3260 FF=FF+ASC(MID$(Q#,P,1))-48
3270 IFFF>57THENFF=FF-10 :GOTO3270
3280 CV#=CV#+CHR$(FF)
3290 GOTO3170
3300 PRINTCHR$(147)
3310 PRINT"*****THE CIPHERTEXT IS:-" :PRINT
3320 V=0
3330 FORL=1TOW
3340 FORL=1TOW
3350 V=V+1
3360 PRINTMID$(CV#,V,1)
3370 IFV=LEN(CV#)THEN7010
3380 NEXTL
3390 PRINT" "
3400 NEXTK
3410 GOTO3330
4000 REM***DECIPHERING***
4010 P=P+1
4020 M=M+1
4030 IFM>LEN(M#4)THEN4150
4040 F=MID$(M#4,M,1)
4050 F=ASC(F#)
4060 IFF<65THEN4110
4070 F=F-ASC(MID$(Q#,P,1))+65
4080 IFF<65THENF=F+26
4090 CD#=CD#+CHR$(F)
4100 GOTO4010
4110 F=F-ASC(MID$(Q#,P,1))+48
4120 IFF<48THENF=F+10 :GOTO4120
4130 CD#=CD#+CHR$(F)
4140 GOTO4010
4150 P=P+1 : M=M+1
4160 P=P+1 : IFP>LEN(Q#)THENP=1
4170 IFFF=ASC(K#)THENP=1
4180 M=M+1
4190 IFM>LEN(CD#)THEN4310
4200 FF=MID$(CD#,M,1)
4210 FF=ASC(FF#)
4220 IFFF<65THEN4280
4230 FF=FF-ASC(MID$(Q#,P,1))+65
4240 IFFF<65THENFF=FF+26
4250 IFFF=88THENFF=160
4260 CV#=CV#+CHR$(FF)
4270 GOTO4160
4280 FF=FF-ASC(MID$(Q#,P,1))+48
4290 IFFF<48THENFF=FF+10 :GOTO4290
4295 CV#=CV#+CHR$(FF)
4300 GOTO4160
4310 PRINT CHR$(147)
4320 PRINT"*****THE PLAINTEXT IS:-" :PRINT
4330 PRINTCV#
4340 GOTO7190
5000 REM ***ERROR SOUND***
5010 POKES4295,0 :POKES4296,15
5020 Q=54272-POKEQ+6,240
5030 POKEQ+1,4 :POKEQ+5,0 :POKEQ+4,33
5040 FORC=1000T01005
5050 POKEQ+1,C/256 :POKEQ,CAND255
5060 NEXTC
5070 POKEQ+4,0
5080 RETURN
6000 REM ***TEXT LENGTH WARNING***
6010 POKES4295,0 :POKES4296,15
6020 Q=54272
6030 POKEQ+5,0 :POKEQ+5,10 :POKEQ+1,250
6040 POKEQ+3,50
6050 POKEQ+4,0 :POKEQ+4,65
6060 POKEQ+4,35
6070 RETURN
7000 REM ***PRINTER OPTION***
7010 PRINT"PRINT" :PRINT" DO YOU WANT
A PRINTED COPY? (Y/N)"
7020 GET# : IF#="" THEN7020
7030 IF #="N" THENRUN
7040 IF #="Y" THENGOSUB5010 :GOTO7020
7050 OPEN4,4
7060 V=0
7070 FORL=1TOW
7080 FORL=1TOW
7090 V=V+1
7100 PRINT#4,MID$(CV#,V,1)
7110 IFV=LEN(CV#)THEN7160
7120 NEXTL
7130 PRINT#4," "
7140 NEXTK
7150 GOTO7070
7160 CMD4
7170 CLDSE2
7180 RUN
7190 PRINT"PRINT" :PRINT" DO YOU WANT
A PRINTED COPY? (Y/N)"
7200 GET# : IF#="" THEN7200
7210 IF #="N" THENRUN
7220 IF #="Y" THENGOSUB5010 :GOTO7200
7230 OPEN4,4 :CMD4
7240 PRINT#4,CV#
7250 CLOSE4
7260 RUN

```



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Inspector

on Oric/BBC

They are both versions of the same program, and are a utility program designed to allow the user to examine the contents of memory in an easy to read fashion.

Although differing widely in length and style, both programs perform the same tasks, and result in the same screen format. Typically I use these programs to browse

through the contents of *Rom* or, more commonly, to 'cheat' at adventure games, by finding out what words etc. the game will respond to.

Program notes

First load the program you wish to examine. Then load *Inspector* and run it. The limitations of the Oric mean that, without some fancy relocation techniques applied to the first program, *Inspector* will overwrite a small part of it.

On running, the program asks for the address of the first byte you wish to

examine. This can be entered in decimal — ie, 3567, or in hex ie, #400. Pressing the spacebar takes you back to this input when the program is running in order to allow you to look elsewhere. Pressing CNTRL C will halt the program.

BBC

Oh, the joys of BBC Basic! To achieve the same results on the Beeb I didn't have to mess about with all those strings and so the program fits or just 5 lines.

First, *load* the program you wish to examine at &E00. Then type *Page =* (some value higher than E00 + the length of the program + some for luck) and *Chain Inspector*. Answer E00 to the prompt (you don't need the '&') and away you go. Pressing any key restarts the program, and *Escape* will stop it.

```

LIST
  IREM      BBC INSPECTOR
           Jeff Tullin 1984

  2
  3
  10 INPUT "START ADDRESS IN HEX "; ST$: ST
  =EVAL("&"+ST$)
  20 @x=5: PRINT ~ST; " "; @x=3: FOR B=0 TO
  7: A=? (ST+B): PRINT ~A; : NEXT: PRINT " "; : FOR
  C=0 TO 7: D=ST+C: D=? (D)
  30 IF (D>31 AND D<127) VDU D: ELSE VDU 4E
  40 NEXT: PRINT: ST=ST+8: IF INKEY$(2)<>"
  THEN 10
  50 GOTO 20
>
  0 REM "ORIC INSPECTOR
    by Jeff Tullin 1984"
  10 :
  20 INPUT "START ADDRESS "; ST
  30 B$=HEX$(ST)
  40 IF LEN(B$)<5 THEN B$=B$+" "
  50 IF LEN(B$)<5 THEN B$=B$+" "
  60 IF LEN(B$)<5 THEN B$=B$+" "
  70 IF LEN(B$)<5 THEN B$=B$+" "

  80 B$=MID$(B$,2,4)
  90 PRINT B$;" ";
  100 FOR B=0 TO 7
  110 A=PEEK(ST+B): A$=HEX$(A)
  120 IF LEN(A$)<3 THEN A$=A$+" "
  130 IF LEN(A$)<3 THEN A$=A$+" "
  140 IF LEN(A$)<3 THEN A$=A$+" "
  150 A$=MID$(A$,2,2)
  160 IF B$=" " THEN A$="00"
  170 IF A<16 THEN A$="0"+LEFT$(A$,1)
  180 PRINT A$;" ";
  190 NEXT
  200 FOR C=0 TO 7
  210 D=ST+C: D=PEEK(D)
  220 IF (D>32 AND D<91) OR (D>96 AND D<1
  23) THEN PRINT CHR$(D); : GOTO 240
  230 PRINT ".";
  240 NEXT: PRINT
  250 E=FRE("")
  260 ST=ST+8
  270 IF KEY$<>" " THEN 20
  280 GOTO 30
  
```

Inspector
by Jeff Tullin

Cryonics Care

on Spectrum

This is a sort of follow up to "Long dimensional resurrection" published some months ago and is based on Sinclair principles in 1964, Robert C.W. Ettinger wrote a book called *The Prospect of Immortality* (Sidgwick and Jackson 1966, £1.25). In it, he suggested that shortly after the end of the lifetimes of those now living, science would have advanced sufficiently

to make ageing reversible and death optional. People could reach this time by means of having their remains frozen.

Full instructions are incorporated within the game, but the basic idea is to set off mines under approaching cars. The game seems ridiculously easy when started, but difficulty soon builds up, and some dexterity and skill is needed to complete it.

Program notes

Lines 1 to 11 Are instructions and initialisation.

Lines 22 to 24 Set up the Facility, represented by a vertical bar with a name written on it.

Line 26 Produces random characters for explosions.

Line 30 Prints a minefield and sets mine array.
Lines 1000 to 1060 Are the sub loop that advances the cars and detects keypresses and explodes mines etc.
Line 1000 Scans whether there is a car present, and if not recycles unless firing routine called.
Line 1010 Detects whether a car has reached the target and if so resets the game.
Line 1020 Advances cars on a random basis.
Line 1022 Detects whether mine exploding has been requested, and if not goes on to ask whether firing routine is called.
Lines 1024 to 1028 explode the mines and cars if present.
Lines 1032 to 1038 fire the ray.

```

1 FOR f=USR "a" TO USR "d": R
EAD f1: POKE f,f1: NEXT f
2 DATA 0,0,1,63,127,255,127,2
4,127,136,8,255,255,255,255,0,19
2,32,48,248,252,255,254,24,0
3 LET test=0: FOR f=USR "d" T
O USR "f": READ f1: POKE f,f1: L
  
```

```

ET test=test+f1: NEXT f: BORDER
3: IF test<>1914 THEN PRINT "da
ta error": STOP
4 DATA 255,63,31,15,7,3,1,0,2
55,252,248,240,224,192,128,0,0
5 PRINT PAPER 4; CRYD
NICS CARS You are inc
  
```

charge of security at Spectrum Cryonics Ltd. You are under attack from a rival organisation who are trying to crash cars into the front of the storage facility. However, the approaches are mined. You can set off a m

ine by pressing its number. You can also use a ray which fires across the front of the facility. This ray only disables, and therefore a disabled car can act as a shield for another.

As the game progresses, there are more cars. Scoring is for each hit, increasing with difficulty. Use of the ray reduces score. If a car gets through, the no of

6 PRINT PAPER 4; "cars and the scoring rate are reduced. Mine 10 is a '!' "

7 INPUT BRIGHT 1; PAPER 5; "Are you ready to play?"; a%

8 REM "Cryonics" is (c) Reeves Telecommunications Laboratories Ltd 1982. A copy of this program is available with many others on the "Porthtown Combo Tape" priced £4 from the company at West Towan House, Porthtown, Truro, Cornwall TR4 BAX

10 PAPER 6; BORDER 7; DIM c(10); DIM m(10); DIM c*(22); LET sc

```
ore=0
11 LET diff=1
13 IF diff<1 THEN LET diff=1:
REM loop return point.
20 CLS : FOR f=1 TO diff: LET
c(f)=28: NEXT f
22 LET c*="SPECTRUM CRYONICS L
TD"
24 FOR f=0 TO 21: PRINT AT f,1
; PAPER 4;c*(f+1): NEXT f
26 FOR f=USR "f" TO USR "j": P
OKE f,255*RND: NEXT f
30 FOR f=1 TO diff: LET m(f)=7
+INT (RND*13): PRINT AT f*2+1,m
(f);"D";CHR*(f+48);"E": NEXT f
1000 FOR f=1 TO diff: IF c(f)=0
THEN GO TO 1030
1002 LET flag=1
1010 IF c(f)=1 THEN LET diff=di
ff-1: GO TO 13
1020 IF RND>.5 THEN BEEP RND*.0
1,RND*.01: LET c(f)=c(f)-1: PRIN
T AT f*2,c(f); INK 2;"ABC "
1022 LET mine=CODE (INKEY$)-48:
IF mine<1 OR mine>diff THEN GO
TO 1030
1023 IF m(mine)=0 THEN GO TO 10
30
```

```
1024 PRINT AT mine*2+1,m(mine);"
"; GO SUB 9000
1026 IF ABS (c(mine)-m(mine))<2
THEN PRINT AT mine*2,c(mine); F
LASH 1;"GHI": GO SUB 9000: PRINT
AT mine*2,c(mine);" "; LET c(
mine)=0: LET score=score+diff
1028 LET m(mine)=0
1030 IF INKEY$<>"F" AND INKEY$<>
"f" THEN GO TO 1039
1032 FOR g=21 TO 1 STEP -1: PRIN
T AT g,2; INK 3; BRIGHT 1;"█"
1034 IF SCREEN* (g-1,2)=" " THEN
GO TO 1037
1036 PRINT AT g-1,2; INK 3; FLAS
H 1;"ABC": LET c((g-1)/2)=0: LET
score=score-2*diff: GO TO 1038
1037 NEXT g
1038 FOR h=21 TO g STEP -1: PRIN
T AT h,2; " "; NEXT h
1039 PRINT AT 0,10;"Score = ";sc
ore; " "; NEXT f
1040 IF flag=0 THEN LET diff=di
ff+1: IF diff=11 THEN LET diff=
10
1050 IF flag=0 THEN GO TO 20
1060 LET flag=0: GO TO 1000
9000 BEEP 1,1: RETURN
```

Cryonics Care
by J de Rivaz

Arcade Avenue

Tropical maze

The big news for Spectrum owners at the moment is, of course, the release of *Sabre Wulf* by Ultimate. This 48K game is a departure for Ultimate since it has been released at a pricy £9.95, supposedly to recompense the company for its 'increased development time'. I am sure most people will feel the game is worth the extra — there's so much average software about these days that is already hitting the nine or ten pound mark — in fact the only real surprise is that Ultimate's first two 48K games were any cheaper.

The theme of this game is similar to *Atic Atac*, but set in a tropical jungle. You have to run around a maze (much more claustrophobic than *Atic Atac*) which 'pages' rather

than scrolls as you move off the screen, killing some nasties, dodging others and collecting various items which help you gain points, survive attack and eventually escape. The graphics are, as ever, superb with incredibly detailed backgrounds and wonderful animation.

Doubtless in later weeks we will be coming back to this game with various high scores, hints and tips (so hurry up and send them in). However, imagine my surprise when no less than three letters appeared within days of the release by people who had completed the game.

Colin Watts of Newcastle-Upon-Tyne has scored 93,260 and finished the game with 65% completed. He finished it on 11 June and passes on the tip for people who are trying to map the jungle — it has 16 × 16 screens and the start screen is six up from the bottom and

nine from the left.

Colin was however pipped by Mr S Dowd, also of Newcastle, whose letter was dated 8 June and who finished with a score of 89,250 and a previous best of 114,000. But the champion, so far, is Des Claypole of Peterborough who on 7 June wrote with a finishing score of 124,405 and 80%, and a high score of 190,060 and 90%.

Incidentally like *Atic Atac*, the score and % are reflections of how many screens you have covered, objects collected, etc. I think it is just as challenging to try and finish with a low % as with a high one.

All three gave proof of completion by relating details of Ultimate's follow up game in the *Sabre Man* series which is revealed on completion of *Sabre Wulf*. This new game, to be called *Underworld*, will be developed using the same Operating System and I pre-

sume continues from where *Sabre Man* enters the Cave mouth.

Finally, on the subject of new releases for the Spectrum, I hope *Sabre Wulf* doesn't obscure the superb *Tornado Low Level* from Vortex (of *Android 2* fame). This new game is fun, addictive and graphically superb. As you fly your jetplane over a rocky landscape, diving low under telegraph lines and flying around houses and trees to hit the target, the shadow of the plane adjusts perfectly to the varying terrain. It is one of the best 30 games I have seen and should not be missed.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to: Tony Kendle, Arcade Avenue, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

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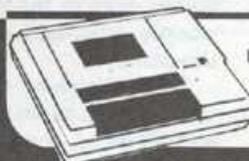
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Circles

on BBC

This procedure is designed to be used within another program. The procedure itself does not refer to any line numbers and all variables outside that of the parameters are local.

The actual functions of this circle drawing utility are:

a) Draws circles at any screen position.

b) Any width or height of circle can be drawn.

c) The start and finish point of the drawing can be specified in degrees, so that ellipses can be drawn.

d) The circle can be filled.

e) The circle can be drawn or filled in any colour depending on the mode.

How to use it

Proccircles (300,300,100,400,0,360,"FILL",3)

This will draw a circle at co-ordinates 300,300 of width 100, height 400. Also it will Fill it in. The colour being yellow (3) providing it is in Mode2.

It has drawn a full circle because the start and finish was specified as being 0 and 360, ie, if they were specified as being 90f and 270 it would draw a semi-circle. If you do not want to fill the circle or ellipse then put "Nofill" into the speech marks instead of "Fill".

```
10DEFPROCcircle(X,Y,width,height,start,finish,fill$,colour).
20LOCALfill,xcor,ycor,AN,angle
30IFfill$="FILL"THENfill=TRUE ELSE fill=FALSE
40GCOL0,colour
50VDU29,X;Y;
60MOVE0,0:MOVESIN(RAD(start))*height,COS(RAD(start))*width
70FORAN=start TO finish
80angle=RAD(AN)
90xcor=SIN(angle)*height
100ycor=COS(angle)*width
110IF fill THENMOVE0,0:PLOT85,xcor,ycor ELSE DRAW:xcor,ycor
12ONEXT
130ENDPROC
```

Circles

by P Venables

Microradio

GW6JJN



The other parts

An attempt now to catch up with some of the new software in the radio computing field.

A letter received from Pinehurst Data announces a Spectrum version of their original Morse Code reading program for the ZX81 that was reviewed a few weeks ago in Microradio. To this day I am amazed at how that program was contained in an unexpanded ZX81.

Also from Pinehurst Data comes a macro construction and animation program for the Spectrum. This will enable the user to create animated scenes or cartoons of up to fifteen minutes duration which will certainly appeal to the amateur television enthusiasts. Contact Pinehurst Data at 69 Pinehurst Park, West Moors, Wim-

bourne, Dorset, for more information. I hope to review these two programs soon in Microradio.

Once again Grosvenor Software has been extremely busy with the release of three new Radio Teletype (RTTY) receive and transmit programs for the Vic 20, the Commodore 64 and the Acorn Atom. Following on from their incredible RTTY program for the Dragon reviewed in Microradio some months ago, Michael Kerry G4BMK in the shape of Grosvenor Software has probably done more than anyone else in making this fascinating mode of communication possible. Combined with Roger Barker of G4IDE Microsystems, who has done the same for the Spectrum, Radio Teletype is now available cheaply for the most popular machines on the market. The new Grosvenor programs will be reviewed in a future Microradio but further information can be obtained from Grosvenor Software, 22 Grosvenor Road, Seaford, East Sussex BN25 2BS.

Radio teletype, for all those people writing to me hearing the term for the first time, is a

form of communication used by radio amateurs, news agencies, satellites and various other marine and commercial users for instant communications on both shortwave and VHF radio. If you tune into a software radio transmission you will often hear noises rather like a computer cassette being played. The chances are that this is radio teletype or RTTY as it is known. All that you need is your micro, a radio receiver, a simple interface (interface not required for the Dragon) and a simple RTTY software program and you can tune the radio and receive all sorts of interesting stuff displayed in plain English (or any other language) on your TV. This is certainly the cheapest and easiest way to interface your micro to the real world. And computer games never seem quite the same afterwards.

Ken Dutton of Dingwall, Ross-shire writes asking how to get into radio computing, pointing out that he has a BBC micro. The best advice I can offer Ken, is to point you in the direction of Ramtop, the radio-computing users group who

deal with several micros but especially the BBC. Ramtop can be contacted at Great Billing Rectory, Great Billing, Northampton. For those people with Sinclair micros interested in radio computing, the user group is Sarug, 3 Red House Lane, Leiston, Suffolk. I must ask anyone contacting user groups to include a stamped addressed envelope to be sure of a reply. The same goes for letters to Microradio, of course.

Memotech users interested in radio-computing will find a sympathetic ear in the shape of Dave West, 129 Old Stoke Road, Aylesbury, Bucks HP21 8DG who wants to contact like-minded Memotechers.

Finally, I have just received a letter to Microradio from Thessalonika in Greece. Which just goes to show that PCW refreshes the parts that other magazines cannot reach.

Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, Microradio, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



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Tony Bridge's Adventure Corner



A mighty mountain

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Hugh T Walker, of Guildford, is, I hope, a patient Adventurer... he wrote a number of letters to The Corner in March and April, and he seems to have had a lot of fun with several Adventures:

"I have solved *Planet of Death* and *Espionage Island*, both by Artic, and *Black Crystal* (by cheating! - it is in unprotected Basic) by Carnell. As for the sample adventure in *Dungeon Master*, from Crystal, I haven't the time to reach the ultimate grade - have you reviewed this one? It has the added bonus of being an Adventure-creation program, although it has not had the publicity which *The Quill* has received." (see my comparative review in *Micro Adventurer*, June issue.)

"*Valhalla* - I think I need to be unemployed to solve this one. Boldir is a stropky so-and-so who won't do anything for me. I thought the answer to "Darkness to Midgard" was the dark building, but the ring was not there!

"*Pharaoh's Tomb* - I can't find all the treasure, and I can't put out the fire in the Fire Room" (Have you tried taking the ice here, Hugh?). Hugh goes on to mention

some of the books that he has read. *Invent and write games for the Spectrum*, by Noel Williams (Noel is an excellent writer - watch out for a joint collaboration between him and the Grand Elf to be released shortly).

"*Dicing with Dragons* and the *Warlock of Firetop Mountain* series by Ian Livingstone. *Spectrum Adventures* by Tony Bridge and Roy Carnell (sounds familiar, and The Grand Elf can add another book to this list - *What is Dungeons and Dragons?*, by Butterfield, Parker and Honigmann.

Hugh then sent me several letters, over a few weeks, about *The Quest*, and his progress with the game. On my recommendation in The Corner, Col 3 No 6, he bought copy of *The Quest* and quickly knocked up 590 points, and the rating of Super Dungeon Master. "I had some problems with the *Save* routine (apparently, the volume settings during saving have to be very accurate, but just needs a little experimentation) - Hewson Consultants could not have been more helpful, phoning me back within a couple of days with the answer to my problems."

Anyway, Hugh goes on to describe *The Quest* in great detail - and it is obvious that he finds the game as absorbing as Alan and Daphne Davies did, back in Vol 3 No 6.

Since then, I have received many letters about this wonderful Adventure. Typical of the remarks made is this, by Des Claypole (oh, sorry, *Celebrimbor of the Gwaith-i-Mirdain* - well, that's what it says here!):

"This is, in my opinion, one of the best pieces of software available for the Spectrum. It contains all the ingredients of a great Adventure, with hi-res graphics, sophisticated sentence recognition, fast response, some tough puzzles and a lot of monster-bashing."

There are one or two problems that seem to crop up regularly in the letters I get. The first is how to get into Castle Oops. When at the door to the Castle, make sure that you have the long Key, and then try emulating Aladdin, and type *Open S* - at least, I would like to think that the program recognises the abbreviation as *Sesame*, and not *South*! And as a further hint, don't venture into the Castle without a mirror. To cross the river, you must have the Magic Ring, or else you will be a list of the directions - the clue will take the form of a list of the numbers:

SOUTH: 1, NORTH: 2, WEST: 3, EAST: 4

Starting from the sign that says *Experimental Curved Space Excavation*, go: 2,2,2,3,3,2,2,3,3,4, and you will arrive at the well-oiled machine (just like PCW!), and then go 1,1, - now on to the forest, in which it is very easy to get lost. From the very start of the Adventure, keep going North until you reach a burrow. From here, go:4,4,1,1,4,4,1, and you should get back to the track. Should you get lost in the forest, go: 4,4,1,1,4,4,1,1,3,3,3,3, and then carry on 2 to the burrow.

These clues were passed on to me by Glenn (Balrog Basher) Morgan, for which much thanks! Glenn has a number of other interesting things to say about *Quest*: as a tip to Ian Ritchie, who was stuck some weeks ago, type *Swims* (while wearing the ring as I said before), and Ian, bear in mind that after killing a monster, you may find that it will drop something that will come in handy. Glenn, along with several other *Questers*, finds that the Wizard actually doubled his luck when he paid him. *Quest* seems to be getting a bit like *The Hobbit*, thanks to the rating system, in which the player gets given a score, as well as a name - I could only ever manage *Cave Crawler*, but Chris Baldwin of Merseyside, Ken Bolton of Yarnton, in Oxfordshire, Graeme Cushion of Doncaster and Christopher John Fox of Cardiff, have all attained 600 points. Christopher has a useful observation to make - you will only solve the Adventure if you score 590 points: the final scene will then unfold as long as you are standing in the right place, when you will be sent to a room in which there is a map.

Before I leave *Quest* (I will return to it, as it is a very promising Adventure), I must mention a letter that I received from Shirley Parker-Munn, down there in Powys. You'll forgive me for not discussing your letter in depth or detail, Shirley, but it was most interesting, and I'm glad to see that you are filling up your time with something interesting - and tell your eldest that he has got very good taste! Shirley has completed many Adventures, among which are *Quest*, *The Hobbit* the Artics, the *Mad Marthas*, Gilsoft's *Magic Castle*, *Diamond* and *Timeline* and would be very happy to help anyone else presently struggling - just send your queries to me (including an SAE as usual), and I will pass them along to her. Finally, Shirley, I hope to be among the first to see your efforts on the *The quill!*

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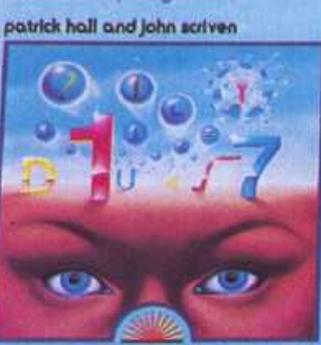
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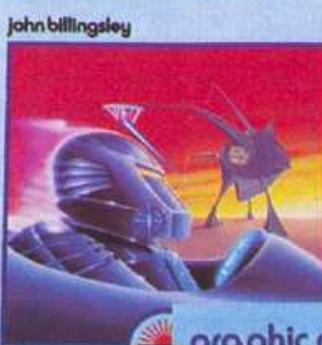
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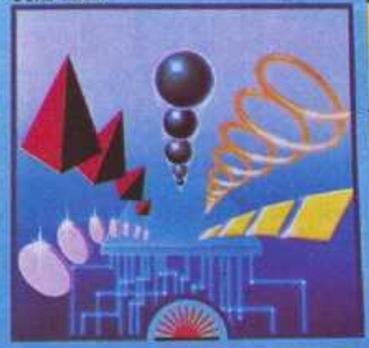
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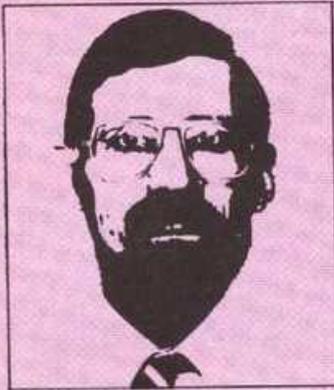
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Hi-res pictures

Simon Johnson of Sheffield writes:

Q I always wondered how commercial programs displayed high resolution pictures. I thought the most obvious way would be to copy the whole display file into Ram. I tried it twice, once into a low address in Ram, and then into a high one. I assume it has to take up 6,000 bytes (6,143 in fact). How then do commercial programs? Can you tell me how you store pictures and then call them onto the screen?

A Pictures on the Spectrum, which is the machine I guess you have, are displayed to the tv screen from two areas of Ram. The Display File (address 16384 to address 22527) holds the data to be displayed on the screen, and the Attributes File (address 22528 to address 23295) holds the colour and display characteristics of each position on the screen.

As you can see the memory required to hold a complete picture is 6,912 bytes (6,144 for the display file, and 768 for the attributes). Now, as 6 pictures would require 41,532 bytes that only leaves 7,620 bytes for the actual program. Not a lot you may think, but an awful lot for a machine-code masterpiece.

The normal technique adopted is to store the pictures at the top end of Ram and then to use a screen switching routine (in machine-code) to put up the new screen. It is also normal practice to store the first screen in the display file and not to carry that overhead in the program.

To store a picture in a program you need to put the contents of the display and attribute files into a high memory address and then save them to cassette as you would a piece of machine code program.

Many commercial programs use complex data compression tricks to get in more pictures. For example, often any particular picture is made up of a number of elements some of which are used as part of other pictures. In this way the screens are built up as a jigsaw of the same parts arranged in different ways.

Broken Genie

C Marriot of Berkhamsted, Herts, writes:

Q I have a non-working Colour Genie (due to a keyboard defect) and I wish to know if it is possible to use the Z80 processor and 16K Ram chips inside to convert my BBC B to a 2 processor, 48K machine, and how I go about it? Also, if I do this, what additional software will I be able to run on it?

A The main reason for adding a Z80 chip to a BBC is to run software under the CP/M operating system. This allows you access to a large number of software packages of which perhaps the most famous are the STAR series (*Wordstar*, *Calcstar* and *Dastatar*).

Whilst it is possible for you to build your own up-grade kit, it would be a prohibitively daunting task. It's not just simply a matter of connecting up a few chips; I'm afraid you would need to be a good electronic engineer.

As I don't really have any good news for you on that front perhaps you would be interested to know of a firm near you who might be able to cure your sick Genie? Computer Field Maintenance, of Excell House, Trust Industrial Estate, Wilbury, Hitchin, Herts, say that they will undertake repairs on any make of popular home micro. Why not give them a ring, and give your Genie a new lease of life?

Basic variables

Jonathan Frank of Edgbaston, Birmingham writes

Q I was wondering if you could tell me how to set up Basic variables from machine-code on the Spectrum. How is the variables area organised? The problem arises from Myrmidon's *Micro-print 85* machine-code utility, in which some variables have to be set up for printing in the right place. I am writing an Interface 1 routine which will let you just type *Print X,Y,CPL,ATTR*, for position, character size, and colour, and the routine will do the rest. Can you help?

A Chapter 24 of the Spectrum manual, pages 166-167 illustrates how variables are held in the Spectrum. If you want more information then why not try Peeking the contents of the variables area for a program that you have written, ie, where you know what the size and names of all the variables are.

Graphics and sound

Michael Crawshaw of Hinchley, Leics, writes:

Q Having read *Commodore 64 Computing* by Ian Sinclair (which was nothing short of excellent) to plough my way through Basic, I have decided to go onto graphics and sound.

To help me I bought *Graphic Art* by Boris Allan which seems too complicated for a beginner like myself. I would be grateful if you could give me more information on 'simple' graphics books.

Also, would machine code be easier to operate the Commodore graphics?

A Your second question actually helps me to

answer your first. I would suggest that you have a look at machine-code programming. The full graphics capability of the CBM 64 is far better exploited in machine code than in Basic. There is a book *Using the 64* by P Gerrard, which covers the use of machine code, particularly in the area of graphics and sound. Although, I could not describe it as a 'simple' guide to graphics I think it is well worth the effort of grafting away at the examples it gives. The book is published by Duckworth and costs £9.95.

Dots per second

Oliver Snow of Shrewsbury, Shropshire writes:

Q I have several questions to which I have been unable to find the answers.

1) What is the meaning of the term Baud rate?

2) Is there any way I could alter the Baud rate for saving and loading from tape on my Spectrum?

3) Where in the Rom are the Save and Load routines located?

A The original meaning of Baud referred to early telegraphic signalling, and meant 'one dot per second'. In computer language this translates to one bit per second. Therefore, when reference is made to 300 Baud, this is merely another way of saying that 300 bits per second, or 37.5 bytes per second, are being transmitted.

The Rom routines for cassette handling start at address 4C2h and finish at 9F3h. In order to use them yourself you will need to refer to them in some detail. *The Complete Spectrum Rom Disassembly* by Logan and O'Hara published by Melbourne House is ideal and contains all the information you will need.

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SPECTRUM 48K Quickshot, interface, microdrive, order form and loads of tapes including: *Valhalla*, *Hobbit*, *Manic Miner*, etc. £150 or swap for Commodore. 01-669-0622 (after 5pm).

DK TRONICS keyboard Mark II. Microdrive compatible. £30. Tel: Bristol (0272) 22850.

SPECTRUM 16K, 30K expansion rom, tape recorder, books. £100 of s/w very good condition, worth £280, yours £140 o.n.o. Tel: Aston Abbot 8130 (after 6pm).

SPECTRUM 48K, Fuller FDS keyboard & printer and scrolls of paper & tape recorder. Lots of s/w, £210 o.n.o. Tel: Wrexham 751 549 (after 5pm).

SPECTRUM s/w for sale. Titles ie: *Hunchback*, *3D Space Wars*, *Spectrum Invaders*, *G-Force*, *Metroids*, *Spectors*, *Ground Attack*. £21 the lot or £3.50 each. Tel: (092 572) 4504 (eves.)

48K Spectrum brand new, printer & joystick. £300 of original s/w inc. *Valhalla*, *A/Attack*, *Jet Set Willy* worth £450. Sell £250 o.n.o. Tel: 01-660 3449.

SPECTRUM 16/48K cassettes, over 50 titles at less than half price (originals) printer, speech box, and sound amp. Half price. Tel: 574 4122.

48K SPECTRUM + 300 of s/w. All

originals, 9 months guarantee. Sell £220. 01-311 6829.

SPECTRUM S/W (all original) half price inc. *Code Name Matt*, *Mugsy*, *Hunch Back*, *Blue Thunder*, *Krakatoa*, *Trashman*, *Lunar Jetman*, *Kong*, *Snore Wolf*. Tel: 0734 667608 after 6pm.

48K Spectrum £80 of s/w Kempston interface £100. Tel: 01 478 8884 after 6pm.

SPECTRUM 48K boxed, manual + leads Kempston + Protex interface + Quickshot joystick £40 of s/w originals. 100's of mags + books £250 ono. Tel: 061 747 4149.

SPECTRUM 48K boxed excellent condition lots of software ie *Jet Set Willy*, *Jet Pack*. Tel: 01 868 1086.

48K SPECTRUM ZX, £300 of s/w, still 9 months guarantee. Will sell for £220. Tel: 01-311 6829.

32K RAM PACK for 48K Spectrum £20. Tel: Aston Abbot 8130.

48K SPECTRUM s/w £100 worth. Inc. *Jet Set Willy*, *The Quill*, *Hungry Horace* + *Chuckie Egg*. + many more. £40 (private sale). Aston Abbot 8130.

SPECTRUM 48K, still under guarantee inc. *Valhalla*, *Hobbit*, *Wheelie*, *Jet Man*, *Football manager*, + books £125. Tel: 01 952 2870. David.

48K SPECTRUM, 11 months old, s/w, *Hobbit* + *Flight Simulator*, + books + manuals. £95.00. Tel: 01 794 5372.

ZX SPECTRUM s/w (all originals). 50

Commodores for sale

VIC 20 8K Ram C2N cassette recorder, joystick, dustcover + s/w and mags. Boxed £150 ono. Tel: New Milton 0425 61 8200.

CBM 64 + cassette unit, packing and manuals, all new and under guarantee. £160 ono. Windsor 64931 eves.

IBM 1515 PRINTER, £110. Vic file. Vic writer, Vic calc. Disk based £30. Southampton 432610.

VIC 20, C2N cassette recorder. Intro to Basic Part I. 5 cartridges 4 tapes, fully boxed. £100 ono. Tel: Reading 868564.

VIC 20, C2N cassette unit, super Expander, stack 4 slot mother board, point master joystick, *Vic Revealed*, *Learn Computer programming on the CBM Vic Games*. £130 ono. Tel: Chester (0244) 332388.

CBM 64 game file. 70 reviews, room for 185 more. Program utilises search, view, correct and create. £5.00. Tel: 01-549 0075.

VIC 20 GAMES for sale. All originals, £250. Tel: 061 5858. 4.30pm.

VIC 20 1 year old, 16K Ram Pack, £85 of games, £25 of magazines + book. C2N cassette unit. Sale £200. Or swap CBM 64. Tel: 987 5461. Mrs Baxter.

VIC 20 + starter pack. Introduction to Basic I & II, Chemistry, Biology, Physics, Mathematics. 12 original games. 8K Ram. £200. Tel: 254 2685.

VIC 20 16K starter pack + cassette + games, 3 month old. £135. 061 225 5950. Paul.

CBM 64 + C2N + 2 joysticks + 13 games (originals). Popular titles + books + mags. Cost £410. Accept £275 ono. Tel: 624 0242/01 326 0961.

VIC 20 for sale. £160. Price inc: cassette unit + £100 of s/w + Joystick. Tel: 01 992 0536.

VIC 20 16K cassette recorder, extra memory joystick, book, cassettes, motherboard. Worth £300+. Want £175. 1st offer secures. Tel: 0342 27520. Eves.

COMMODORE 64. Quickshot joystick £7, software, *Manic Miner* £5, *Revenge of the Mutant Camels* £5, *Skramble* £5, *Radar Rat Race Cartridge* £5, *Hektic and Jungle Story* £1.50 each. Ring 01 204 2456.

VIC 20 CASSETTE, games, mags,

brand new. Either swap or sell for 48K Spectrum. Contact J. Bishop, 29 Shir-dale Close, Maescywmmer, Mid Glam, South Wales. CF87QL £130.

CBM64 5 month old, C2N cassette, Simons Basic, Joystick, Games & books and more. Cost over £400. Accept £275. Tel: North Weald (Essex) 3796. After 7 or weekend.

For sale

ORIC 1 48K computer with software, £65 or swap Texas TI994A. Telephone Parbold (025-76) 3731.

MICRO DEAL software, unexp. VIC-20 Turbo-Grip, £2 or swap for *Wacky Waiters*, *Quadrant* or *Frogger*. Tel: Glossop 2382.

SHARP M2700 & data recorder & dust cover, £70. S/W 6 months old. Excellent condition, worth £370 sell for £250 o.n.o. Tel: Colne 865821 (after 4pm).

FOR SALE. Binatone TV game *Mark IV*. Tennis, Football, Squash, Squash Practice. 2 paddles, £10 o.n.o. Phone 031 664 8253.

C.B. 40 channel Gemini, worth £122 & power pack, aerial, SWR, 2 aerials. All worth over £170 will swap for 48K Spectrum in good nick with tape recorder leads etc. (Steve) Thanet 41453.

TIMEGATE, *Valhalla*, *Manicminer*, *Stonkers* and many other titles for the Spectrum £28 for the lot, individuals half price. Quickshot joystick with interface, £180 o.n.o. Phone 5pm and ask for James (0908) 565465.

MICRODRIVE plus Interface 1 with 5 cartridges £85; Interface 2 with "Cookie" Rom, £18 (postage extra £2). Tel: Norwich (0603) 401628 (after 5.30pm).

FRENCH 'O' level revision on CBM64, complete 'O' level revision test. Just in time for your 'O' levels only £4. Ring (021) 742 6334 after 5pm. Also CBM64 software to swap.

QUICKSHOT II joystick, brand new, unused duplicated gift. Retail price £193.95 sell for £10.50 Tel: Baschurch 260405

EPSON HX20 forth rom and parallel interface for sale. Wanted 16K add-on memory and other goodies incl 8143 or 8148 interface

PRINTER data dynamics 390RO teletype 110 baud (works via RS232). Uses plain paper roll £50 Tel: 01-959 1844 (eves)

FREE 48K Oric 1 + £40 software + book to first caller to buy my Oric 1 power pack (£110). Wanted PB100 will pay £30. Phone now Stafford (0785) 211445 (lan)

LYNX 48K, boxed, with leads, manual, software etc. As new. Unwanted prize. £150 ono phone 01-570 8335

LYNX 48K joystick interface, 7 games, under guarantee £120. Tel: Newcastle 0632 661863

SIMONS basic for CBM 64 £30.00 New. Tel: Bracknell 498173

2 X 8" disc drive complete with Power Supply + cables 1.6 megabyte capacity. Never been used £330 ono Tel: Notts 262498

LYNX 48K + instruction manual + 3 games boxed £150 ono Tel: 0825 4707 Mr Hancock

INTELLIVISION 3D games console and computer adaptor with keyboard plus two games. Swap for Spectrum 48K. Phone Roy on Lincoln 730251 after 18.00 hrs Monday to Friday.

ORIC 1 48K plus 14 software tapes including *Oricom*, *Zenon*, *Galaxians*, etc plus leads and manual. Cost £260. Ask £110 ono. Tel: 01-840 3945.

BBC HOBBIT tape system unit, leads, manual, 3 tapes Rom. Normally £166, sell for £110. Keyboard control rewind etc. 60 files, 60K each side. Tel: 0232 716583 after 6pm.

PRINTER STAR DP510 (Epson compatible) manuals, BBC cable, original packaging — as new. Reason for sale — upgraded to Daisywheel. £170 ono. Cambridge area. Phone 022 026 3107 after 5pm.

SHARP MZ80K 48K; Sharp P3 printer plus interface box, books and software including Word Processor, assembler etc. Offers if interested to Langport 250130. Can deliver if necessary.

PRINZTRONIC HOME ent. centre + 6 cartridges £20.00. Tel: 860 207 (Cirencester).

48K ORIC 1 + £65 s/w & books to Forth & Assembler £70 ono. Tel: 0272 516335 (9am-11am).

LYNX 48K inc. machine code program books, £36 of s/w. Lynx user + Nilog news letters. Dust cover. Boxed. Loads etc. Excellent condition. £170. Tel: 0344 882255. M. Fenton.

STONECHIP ELECTRONICS echo amplifier for Spectrum, volume, tone, control, switch for 'saving', 'loading' no more swapping leads ½ new price only £10 or swap orig s/ware Tel: 01-529 0071.

VALHALLA ORIGINAL copy brand new with instruction manual only £6.50. Tel: Stowmarket 615581 (evenings).

ORIC 1 16K + tape recorder + 5 tapes including Ultra, Hopper & Invaders, also 8 books including Oric Handbook, Oric Companion, & 6502 machine code. Offers over £130 considered. Tel: 01-699 5354.

COLECO TURBO expansion module £25. CBM64 owners with disc drive required to swap software and ideas, contact Bob after 6pm on (0946) 831459.

STAETTLER DRAWING board and compass set. V.G.C. worth £50. Sell or swap for 48K Spectrum software. Offers to Colin. Tel: Kilwinning (0294) 52723 evenings.

ACETRONIC GAMES cartridges shooting gallery, Black Jack, Circus, Soccer, Invaders, air/sea attack, musical games. All excellent cond. £4 each Tel: York 51130 after 6pm.

1515 PRINTER (84/VIC20) 8 1/2 x 11 inch paper. 1 box paper, spare ribbon, lead, manual. £180. o.n.o. Tel: 01-840 3610 buyer collects.

SHARP MZ-80K and book and s/w incl. Space Invader, Galaxian and Chess. £220. Tel: 0229 37853.

ORIC 1 FOR SALE 48K and necessary equipment. No extras. £130 ono. Brand new! Tel: 01-690 6760 office hours (Ronnie).

CURRAH SPEECH UNIT, one month old. Excellent condition with manual and tape. £25 ono. Tel: (0244) 533 438, 4pm-7pm.

SHARP MZ-80K 48K Ram with manual, Basic tape and loads of software includ-

ing Defender, Pacman, Asteroids, Wizards Castle and Haunted House. Any offers considered. Phone Diss (0379) 51216.

CAMBRIDGE COMPUTING Intelligent joystick (complete) £30 or swap for ZX printer also swap s/w, Hobbit, Manic Minor, Trans AM, Android, etc. for rolls. Tel: Joe 01-622 9929.

FULLER BOX, brand new, unwanted gift. £20.00. Tel: 0703 447704.

ORIC 1 16K as new, plus Ultra tape and book, The Oric 1, by Ian Sinclair. Only £80 for quick sale. Contact Paul, 14 Rider Rd, Woodhouse, Leeds.

LIMITLESS LIVES on two top — selling games. Also, how to jump from one level to another in one of them. Easy — Just phone St. Helens 26314 now and find out!

48K LYNX with £165 software, all originals. Plus Joystick and interface, book and newsletter, £190 or swap for CBM 64 and C2N. Tel: 061 339 6779 after 5pm.

ZX INTERFACE 2 Quickshot Deluxe Joystick, will swap for Kempston Joystick interface or sell for £25 ono. Tel: (0482) 881811, North Humberside.

SOCCER, Defender, Pole Position, Blue Max, Hobbit for CBM 64 for sale. Phone 061 881 3651. Ask for Tony.

SHARP MZ80 A boxed as new. Huge quantity of s/w. £350.00. Tel: (0325) 84968.

MICRODRIVE with two cartridges i/face one cables etc. Some software. As new in original box. Offers around £100. Tel: (08833) 4503.

LYNX 48K As new plus 'Lynx computing' book plus software. £130 Belper 4080.

TRICKSTICK Joystick, programmable interface and Attactics program. Unwanted gift. New unused. Sell for £40 ono. Write: Jeff Wass, 9 Irby Road, Scunthorpe, S. Humberside DN17 2ES.

SHARP MZ-80K, 48K, integral monitor, cassette, boxed, excellent condition, 4 Basics, software, 15 spare cassettes, cover, reset switch, manuals, Z80 book. £200 ono. Tel: (0226) 766342 (after 4pm).

SELL COMPETITION pro Joystick and Kempston interface as new. Worth £24.00. Quick sale at £15.00 or offers. Ring after 5.00 (0703) 842461. Ask for Jon.

ADVENTURE LAND and Starbattle cartridges and Wacky Waiters cassette and Humphrey cassette. Requires 8 or 16K expansion 3K expansion cartridge. Worth £80. Selling for £25. All for VIC 20. Largs 675184.

INTELLIVISION for sale with Soccer and Star Strike. Quick sale £45 ono. Tel: Pinner 8666538.

SHARP MZ80K 48K + 2K Quantum Hi-Res graphics. Basic and Forth tapes.

Some games tapes + Sharpsoft mags and books. £275. Tel: (Manchester) 224 9835.

MCP 40 COLOUR PRINTER PLOTTER Centronics interface includes spare pens, paper. As new. £100 including postage or will swap your 48K Spectrum Issue 3. Will pay for interface 1. Dennis 0203 385614 or 0993 830248.

ORIC-1 48K will all leads plus software (including Xenon-1). Perfect condition. £110 ono. Tel: Turvey 777.

TEXAS T199/4A 16K with cassette recorder plus tapes, introduction to Basic programming, interface cable and books. 4 months old. Bargain at only £95. Tel: Holbeach 0406 370190 evenings only.

SEIKOSHA 250X, 9 months old, excellent condition. Free box of paper. £185. Antony, HSE 68, Castle Irwell, Cromwell Road, Salford.

MEMOTECH 512 with data recorder and extra tapes. Worth new £350. Tel: 01-622 2306 with sensible offers.

SALE SELL: Paratroopers, Wacky Waiters, Amok and Wizard and The Princess, £5 each or swap three for an Adventure Cartridge or 1 for Snooker by 'Visions'. Offers taken, all new. Tel: Sean Taylor, Farnham Common 2922.

SHARP MZ 80K, Parnell printer interface Crystal Basic SP-5025 modifications. Zen assembler, disassemble. £195 ono. Alsp Epsom MX80 available. Probably deliner. Tel: 01-642 3318, 0202 473676, 0329 23870 ext. 244.

BRENDEL, new, excellent condition, computer desk. Ready built £15.000. Tel: (0782) 24552.

48K LYNX plus s/w. £100. Tel: 01-691 0118.

SEIKOSHE GP 100CC printer for Vic 20 or Com 64. 3 'O' Level revision for the Vic plus 8K. Ring Paul for details on (0782) 550546.

Wanted

WANTED 'DRAC MAN' and 'Silent Running' from 'Your Computer' magazine. Someone must have got them to work! Please ring 0278 663201 or write 14 Halswell House, Goathurst, Bridgwater, Som.

WANTED, SPECTRUM machine code utilities, assemblers, disassemblers, monitors etc. Send any lists + an SAE to Richard Smith, 14 Henson Road, March, Cambs PE15 8BA.

WANTED SHARP PC 1500 and printer/interface plus RAMpack. Will pay up to £170. Phone Tiverton (0884) 256119.

SWAP VIC-20 + 32K switchable RAM pack + 3 cartridges + over £100 of software + cassette deck + joystick for CBM64 or sell for £220. All in very good cond.

WANTED INFO on Micro Mice. Have you built one? Have you a design? Wanted for a school project, please help. Tel: Gary on Bristol (0272) 48161 or 23789. Many thanks.

ORIC-1 software to swap, titles include: Hunchback, Xenon-1, Chess, Golf, plus many others. Ring M. Hodgson at Halifax (0422) 201747 evenings or weekends.

SWAP SHARP PC1500 8KRAM + plotter, printer, interface + software for Spectrum 48K issue 2/3 plus printer and/or keyboard. Tel: Sheffield 471160 at 7.00pm. Sharp MZ700 plus printer cassette integral £365 ono. Tel: Sheffield 471160.

WANTED WATFORD DFS ROM and manual. Also Computer Concepts Print Master for ROM for BBC. First reasonable price quoted will be accepted. Tel: Neil on (0772) 600175.

SWAP MATTEL Intellivision + 7 carts and 40 chan. CB, SWR meter and two aerials (v.g.c) for your issue 2 or issue 3 48K Spectrum or CBM 64. Tel: 0933 76849 please.

SPECTRUM SOFTWARE to swap. Ten Little Indians (Digital Fantasia) for any Level 9 or other Digital, also Storage G.S., Astro Blaster, Heathrow A.T.C. Embassy assault, swap separate or everything for Quill. Tel: (0908) 643516.

WILL SWAP superior software Lost City and Gideon's Gamble for two more adventures. One must be Legion + any other. Ask for Philip. Leyland 07744 51872.

SWAP M10 PROGRAMS for ZX Spectrum. Send your list for exchange. A Tuscano Francesco, Via Dei Salici 17, 20025 Legnano (MI), Italy.

DRAGON 32 swap any three programs for Merlin Sprite Magic with booklet. Choose from Devil Assault, R.O Darkness, Crazy Painter, Pedro, Cuthbert in Jungle. Contact Ian, 3 Birchwood Ave, Grove-Hill, M'bro Cleveland TS4 2XB.

WANTED THE QUILL. Offers under £8. Will pay 40% for most other Spectrum software. Tel: Blackpool, (0253) 891223.

EXCHANGE 3D Deathchase, Wheelie, Zoom, Ant Attack for The Quill. Write to Doug Duffin, 1/4/1 Muirhead, University of Stirling, Stirling, Scotland.

WANTED — TI-99/4A Extended Basic or editor/Assembler module. Will pay half-price. Ring (0924) 468535 (after 12 noon).

£20 IS ALL I am wanting for my Spectrum sound synthesiser + tape. Cost over £30. Will swap for hand-held C. B. or keyboard. Tel: (0241) 54106.

SHIP OF THE LINE, Snooker, Everest Ascent, Wheeler Dealer, All for CBM64. Swap for other CBM64 progs or sell £3 each. Tel: (0206) 45285.

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

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

COMPUTER SWAP

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

Name.....

Address.....

Telephone.....

WANTED! SPECTRUM disk drive. Viscount, Cyborg or otherwise. Must work well, be reasonably priced, and fairly new. Write to: Mr Stephen Richards, 14 Braehead Drive, Barnton, Edinburgh EN4 6QL.

SPECTRUM SOFTWARE swap, to swap Dallas, Derby Day, Handicap Golf, plus 16/48 tapes 1 & 2 for any one of Hunchback, 1984, Chequered Flag or any good simulation. Jeff (021) 779 3026.

SPECTRUM OWNERS! Gilsolt's Quill wanted, will pay reasonable price or do part swap for my copy of Pogo. Contact Mr. Nicholas Forsyth, 8 Parkgrove, Loan, Edinburgh. No pirates — only originals.

DRAGON OWNER would like to swap ideas, progs etc with other Dragon owners. Contact Tom, 3 Wantage Woodside, Telford, Salop TF7 5PA.

WANTED 16K RAM pack for VIC 20. Ask for Craig or Gerry. Tel: 0743-81405 after 5pm.

SWAP ZX81 + 16K pack + manual PSU + £50 worth software. Only 3 months old. For 16-48K ZX Spectrum (issue 2 if possible). Tel: 683 0140.

SPECTRUM EDUCATIONAL swap s/w originals. ABC lift-off, countabout, Paddington, Shopping, Mix-up, Problem Picture, Alphabet. Tel: 01-800 6767 after 7pm. Also Sinclair Learn To Read.

COMMODORE 64 software to swap. Over 30 games and utilities on tape and disk. Phone: 0325 480298 and ask for Steve.

SWAP ATARI 2600 VCS including cartridges: Defender, Star-Raiders, Missile-Command & Combat. also 16K ZX81. Cost over £240. For 48K Spectrum Phone 0294 53556 (after 6pm).

SPECTRUM 48K swap/s Reliant Robin or Car with some MOT/Tax over £200 software 11 month guarantee Protek Joy/Int books, mags, tape/rec. M/Miner, Mooder 11, Ant Attack, Froggy, Zzoom, Flight Sim + many more. Tel: (0772) 709832.

WANTED DRAGON 32 s/w Tel: 01-223 2778 Mr Boxton.

WANTED SPECTRUM 48K with trimmings. Good price paid. Tel: 01-767 6109 — (eves only) Mr. Osbourne.

SWAP SINCLAIR ZX Chess (48k) and Cruising (16/48K) for Superchess 3.0 Tel: 051-430 8504.

WANTED — 48K Spectrum leads and manuals. Will pay up to £70. Phone Gary, Liverpool (Huyton) 051-480 1407 after 6pm.

COM X-35 WANTED. Swap for TI99/4A, perfect condition, as new, plus cassette lead, software, and books. Preferably Tyneside area. Outside area buyer collects. Phone (0632) 553158 after five. Ask for Ian.

SWAP OLYMPUS OM2N F1.8 + 80 200 O.T. 200M 2M Teleconverter + various other accessories. For BBC model B 1.2/OS or CBM 64 with C2N unit. Fred, Mkt Rasen (0673) 843127.

TO SWAP SINCLAIR/Artic Forth for Kempston joystick interface only. also Pimania for Snowball or Colossal Adventure. Tel: 01-594 2281 (after 5pm).

WANTED. CBM/PET wanted. Would even consider non-working earlier model. Please phone Chester 675717 after 6pm or weekends. Also require disused stock control program for 3000/4000 series PET.

SWAP ATARI V.C.S. with eleven popular games for ZX81 + 16K plus software and manuals. Tel: 0786 70581 after 6 or write to 30 Donaldson Pl., Cambusbaron, Stirling FK7 9LQ.

VIC 20 SWAP Adventure Land Cartridge E for any other Scott Adams Cartridge. Tel: 02357 4221 after 4pm.

SWAP DEVILS of Deep, Paras, Star-Trek, Fruit machine, the Orb, Ship of Doom, Dracula/Rock'N'Roll, for Inca Curse, Planet of Death: any four for The Quill: W.H.Y.: many more: Tony Fields 525685 (Armagh City) after 9pm.

WANTED ACORN Electron with some s/w for £100-£150. Tel: 01-500 5513 (after 5pm).

WANTED ATARI 810 Disk Drive. Tel: 01-487 4860 (after 6.30pm).

WANTED SPECTRUM 48K or CBM 64. Will swap Atari VCS + 6 games inc: Pac Man — Phoenix — Frenzy, with cash adjustment. Phone Horley (02934) 6284.

WANTED SPECTRUM 48K. Phone Mrs Gatnell on Buckley (0244) 545255.

SWAP VIC 20 Voodoo Castle for any other VIC 20 adventure game (03552) 29027.

SWAP URBAN Upstart + Invincible Island for Adventure Quest (Spectrum). Tel: Romford 67307.

SWAP Spectrum 48K boxed inc. Conbridge Computing joystick + interface, games inc: The Quill, Hobbit, Atic Atac, Androids for BBC B. Tel: Chris Otley 0943 465310.

GUIDE TO playing The Hobbit, as new, swap for Atic Atac, Lunar Jetman, Alchemist or any good software. Write to 144 Westerleigh Road, Downend, Bristol B516 6AT.

WANTED 48K SPECTRUM. No software needed. Will be able to pay up to £50. Tel: 01-539 5402. Please ring after 6pm. Chung lo.

ATARI VCS games wanted. CBM 64 or VIC 20. Games offered in exchange. Ring Stevenage (0438) 811634 after 7pm.

WANTED SPECTRUM Hi-Res Graphics Unit + clock for 48K, disc-based handy model. I must have appropriate s/w. M. Rowland, 22 Westbourne Park Villas, London W2 5EA.

VIC 20 STARTERS pack for ZX Spectrum 16 or 48K or sell for £100. Tel: 01-748 9544.

COMMODORE 1541 DISC will pay up to £100 also musical software and a suitable keyboard. Tel: 0436 71598.

SPECTRUM PLUS cash adjustment in exchange for my BBC Model B (1.2) in new condition. Finance forces swap. Phone 0629 56771 can deliver 100 miles radius Derbyshire.

DUAL DISK DRIVES and interface for Sharp MZ80K or any Z80 based computer with dual disk drives. Colour not essential. Tel: 0602 733696.

URGENTLY REQUIRED. ZX81 adaptor 603 1206. After 5pm.

WANTED 16K Ram pack for Vic 20. Switchable or standard. Tel: Stevenage, Roger 0478 722389.

ADVENTURE HELPLINE

Magic Mountain on Spectrum. I can't find magic carpet. Anne Ellmes, 16 Forest Ave, Cefn Hengoed, Mid Glamorgan.

Voodoo Castle on Vic 20. How do I get past the Ju-Ju Bag? How do I get out of the jail cell? How do I get the wooden boards in the chimney? Andrew Spencer, 16 Lawson Ave, Grimsby.

The Count on Vic 20. 1) What use are the vents? 2) What do I do once in the crypt? S Parker, 96 Tithelands, Harlow, Essex.

Twin Kingdom Valley on Commodore 64. How do I get the master key off the dragon in the desert king's castle without being burnt to death? J C Ellis, The Vicarage, Gorse Terrace, New Tredegar, Gwent.

Black Crystal on Spectrum. How do I get across the abyss and through the temple maze and keep up enough spiritual and physical strength to carry on the quest? Trev King, Box House, 25 Ashby Rd Woodvill, Burton-on-Trent, Staffs.

The Count on Vic20. How do I enter the vent in the crypt and how do I kill the bat? Michael Gargett, 42 Wright Cres, West Hill, Bridlington.

Pirate Cove on Vic20. Where can I find the second treasure? Kate Buckingham, 144 Elmwood Rd, Barnton, Northwich, Cheshire.

Lords of Time on Spectrum. How do I get out of the pit west of prairie in time zone 3? P J White, 24 Caldwell House, c/o West Park Hospital, Epsom, Surrey.

Valhalla on Spectrum. I've found Offrir, but I can't get Drapnir, and how do I open the chest in Hell? Colin Williams, 28 Erskine Rd, Colwyn Bay, Clwyd.

The Count on Vic20. How can I break the dark lens in the solar oven, is the crypt a dead end, and how can I get on to the castle roof? Simon Crowhurst, 35 Anerley Close, Allington Park, Maidstone, Kent.

The Hobbit on Spectrum. How do I get out the goblin's dungeon, and how do I get to the east bank of the river? Alistair Hayes, 4 Dawpool Drive, Bromborough, Merseyside.

The Quest on Vic20. How can I get the jewelled sword in the lower caverns? M Butterfield, 14 Bleasedale Ave, Clitheroe, Lancs.

Urban Upstart on Spectrum. How do you fly the plane? (I have the book, the flying suit, and I have inserted the key into the panel). Alex Hughes, 36 Ralph Rd, Shirley, Solihull, W Mids.

Espionage Island (1) and Adventure Quest (2) on Spectrum. (1) I get shot by helicopters when in boat. (2) Can't open the rusted iron grate, and can't reach orchid above head. Tim James, 12 Egan Close, Gatcombe Park, Hilsea, Portsmouth.

The Hobbit on Spectrum. How do you get back along the forest road without being killed? Is there a way back through the elvenking's halls? Mark Casey, 7 Marlston Ave, Lache Park, Chester.

Pettigrew's Diary on Dragon 32. I have found £600 to buy the train ticket, but who do I buy it from? Gary Price, 28 Larkhill Cottages, Olo Langho, nr Blackburn, Lancs.

Diary

Electron and BBC Micro User Show	Alexandra Palace London	July 19-21 10.00am-6.00pm July 22 10.00am-4.00pm	£3.00 adults £2.00 children	Database Publications 68 Chester Road Hazel Grove, Stockport 061-456 8383
Sinclair Computer Users Exhibition	Essex Exhibition Centre Moulsham Street Chelmsford Essex	July 21 10.00am-6.00pm	50p adults 30p children	Essex Exhibition Centre Moulsham Street Chelmsford 0245 25900
Scottish Personal Computer World Show	Assembly Halls George Street Edinburgh	July 26-27 9.30am-8.00pm July 28 9.30am-5.00pm	£1.50 adults £1.00 children	Scottish Industrial and Trade Exhibitions 8a Charlotte Square Edinburgh EH2 4DR 031-225 5486
2nd Official Acorn User Exhibition	Olympia 2 Hammersmith Road London	Aug 16 (trade day) Aug 17-19	£2.00 adults in advance £3.00 and £2.00 on door	Small Enterprises 20, Orange Street London WC2H 7ED

FACTORY FLOOR

Factory Breakout is a pretty striking new program from Poppy Soft — one of those small companies who has kept going in difficult times on the sheer quality of its programs.

Factory Breakout is a three part arcade game which rings enough changes on old themes to be pretty compulsive. You are a robot trying to escape from a factory; the first step is to be born — yes, problems start early for this robot. This involves swivelling round and round to shoot the laser beams zapping from all sides — its sweaty-palmed stuff.

If you survive this then there is a short, avoid things section where your robot must avoid rejection lasers (a bit easy this bit) and then on to a kind of vertical *Pacman*.

This section involves going up lifts and coming back down the screen via series of trapdoors which gradually change colour as you repeatedly pass through. You are chased by a group of monsters who are certainly related by blood to the *Pacman* ghosts. The only way to beat them is to 'eat' a sort of power wall for a few moments, the globs grin becomes fearful and twisted and you heap your revenge upon them. Cruel but just.

Program *Factory Breakout*
Price £5.50
Micro Spectrum
Supplier Poppy Soft
 The Close
 Common Road
 Headley,
 Newbury
 Berkshire

CRYSTAL BALL

Classical looniness from Superior Software in the form of *Mr Wiz*. A program with one of those plots of such oddness you really can't imagine where they come from (drug crazed 16 year-olds I'll be bound).

Mr Wiz is a tax inspector. OK, I'm lying — *Mr Wiz* is a wizard and you have to move him around a garden eating cherries (why cherries? I don't know, perhaps they're easier graphically. Objecting to him eating cherries are gremlins —

these nasty personifications of thing that don't work properly will attack you and can only be stopped by lazer? No. Gun? No. Wand Zap? No. Mr Wiz's trained Doberman Pincher? No. They are stopped by Mr Wiz dropping apples on them or by him lobbing his crystal ball at them.



Additional facts you may want to know about this game are that gremlins may occasionally dig a tunnel to get you and that eating magic mushrooms earns you extra points. However this is the gremlins dead and having their dwelling demolished in such a humiliating fashion makes them very upset. You can see their point. Aside from the fact that Superior Software have a pretty good reputation, I should think the description of the game alone would be enough to make you want to rush out and buy it.

Program *Mr Wiz*
Price £7.95
Micro BBC B
Supplier Superior Software
 Regent House
 Skinner Lane
 Leeds LS7 1AX

OBSTACLE COURSE

Tales of the Arabian Nights is the latest arcade release from Interceptor software who have been putting them out at quite a rate recently.

Like a lot of games recently this one is in that nebulous area where adventures and arcade games meet. Basically, what you get is a whole series of arcade games over several screens in which prince Kalen-



GOTHIC MUSIC

You've seen the movie (assuming you're over 18 — if you're under 18 you probably sneaked it onto your parents video when they were out), now play the game which is even more harmless (in terms of creating deep seated repressed fears). The *Evil Dead* has been released.

The game has had a lot of coverage (by us admittedly) and could be a dreadful disappointment. Fortunately, it isn't. What it takes from the film is a shack for its setting and combat with zombies as its general aim; apart from that nobody gets raped by a tree and there isn't much gore.

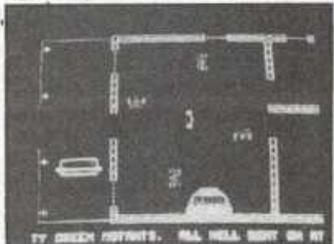
The screen display is of a top view of the shack — it scrolls left and right over three screens to fit it all in. Various items are displayed, a fire, a couple of beds, etc, and of course numerous zombies trudging about with arms outstretched like little green fork lift trucks.

However, these are occasional zombies (like occasional tables) since on occasion they revert to being your dear friends who came on a happy holiday with you to this lonely deserted place containing the fearful mystery ... now read on. (Actually have you ever known anyone go on holiday to lonely deserted places with evil mysteries that turns everyone into zombies — apart from Rhy!, of course, but I blame the bingo there — I mean why not go on a nice package tour to Benidorm or something.)

Anyway, aside from the intermittent *Zombies*, there are various objects that appear from time to time. Some of

these are obviously useful like axes (I think they are anyway) others, like what seems to be a toothbrush, seem less so.

In a way playing the game has as much in common with adventure and strategy as with bang bang reaction stuff — rather like *Atic Atac* you simply have to find out what does what by trial and error — so far I have discovered that if one zombie meets another zombie, then at least one of them becomes dismembered and nasty zombie legs, arms, etc, fly about, risking life and limb (geddit).



The other thing is that the *Zombies* do not always come straight for you — being zombies they are not too goal motivated and generally prefer to trudge about hoping something turns up.

Graphically, there isn't anything technically amazing here, but equally you won't be disappointed — what is important is the thought that has gone into the design of the game; you unearth its secrets slowly — like an adventure. As a bonus it has the most gothic opening credits and music on the demo mode I've yet seen.

Program *Evil Dead*
Price £6.999
Micro Commodore 64
Supplier Palace Software
 276 Pentonville Road
 London N1 9NL

der has to run and jump over several obstacles to win (poor woman) his princess.

As a game it's pretty good — there are a couple of features that lift it well above the run of the mill. One is the speech which narrates the story as you go along, more impressive is the musical soundtrack which is brilliantly arranged and designed, and tends

to prove just how important computer 'soundtracks' are going to be in the future.

Program *Tales of the Arabian Nights*
Price £7
Micro Commodore 64
Supplier Interceptor Micro's
 Lindon House
 The Green
 Tadley
 Hampshire

COMING SOON

Melbourne House will be releasing not one but two adventures around September time — *Sherlock Holmes* you will have heard of but *Zim Zalabim* may be less familiar.

The program represents what will surely be the next wave in adventure games where animated graphics are coupled with classic text adventure puzzles and plots. Indeed, the wave is only 'next' in that there's been nothing much on home micros in this country. In America, on machines like the Apple IIc, such games have been around from the beginning of this year.

It looks like *Zim Zalabim* will be the first such program in this country and it's on the Commodore 64. The unfinished version I played with was extremely interesting, although I think I'd better reserve critical judgement for the moment because important features like the graphics and plot are still expected to change.

To give you some idea, you begin standing outside a palace wall, you are a little man who can be moved left and right with a joystick and the same time more elaborate instructions can be typed in like a conventional arcade game.

Thus moving left you will come across (as the screen scrolls) a beggar; type *Examine beggar* and you will find out what, if anything, the beggar has that can help you. Typing *Look* makes the little man move his head left and right. Type *Go Forward* and you move on to a new scene, although you have to wait a few moments for the scene to set itself up.

Roughly speaking, as in *Valhalla*, 'physical' commands have physical consequences on screen; eg, *Climb Rope* makes the man climb a rope. In other respects it works like a conventional adventure printing a response to your input on the screen; eg, You look you see the castle walls... etc.

Where *Valhalla* used text input and animated graphics to create a new sort of adventure, *Zim Zalabim* is using similar concepts to bring life to more

familiar styles of adventure. I await September with some interest.

Program *Zim Zalabim*
Price
Micro *Commodore 64*
Supplier *Melbourne House.*

FOUR TASKS

Dimension 21 is a company, new to this country, in the Commodore 64 market. Its first release is *Spy School* a multi part, multi screen arcade game — each part representing a different task you have been set by your spy school masters to prove your spy mettle.

There are four tasks, *Sabotage* — blow up an enemy base, *Burglary* — steal a briefcase without tripping various alarms, *Sniper* — shot all the helicopters and *Escape* — a five screen maze with a variety of obstacles.

It's all very fast and furious with some nice animation. What's odd is that everything is so small — the little man you are moving around looks like something from an early Spectrum program. It's a bit of a shock to those of us used to large detailed sprites on Commodore games, but it doesn't in the end make too much difference. My main concern is that it's probably a bit easy — I managed two of the four tasks on the second attempt.

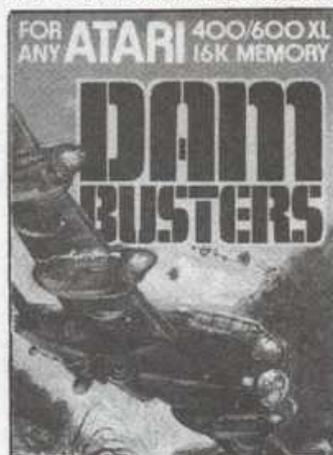


Program *Spy School*
Price £5.95
Micro *Commodore 64*
Supplier *Dimension 21*
91 The Broadway
Southall
Middlesex
UB1 1LN

BOMBS AWAY

Atari software for £5.50 is such a rare sight that it simply has to get a mention here. *Dambusters* is the program in question and despite the price there really isn't anything wrong with it at all.

Not I should add that there is anything very spectacular about it, but then the company producing it don't pretend that it is a *Zaxxon* or *Pole Position*.



What you get is a scrolling landscape dodge, shoot and bomb game where you pilot your Lancaster towards the Ruhr dams there to release your bouncing bombs and set back the German war effort for years (or days depending on which analysis you prefer).

Fight off baddie fighters, warships and anti aircraft fire, release the bomb at exactly the right moment, fly over a mountain and return home. It's a sort of scramble, but then it's sort of good fun and sort of cheap.

Program *Dambusters*
Price £5.50
Micro *Atari*
Supplier *NDSL*
Newmarket Distribution
8 Green Street
Willingham
Cambs CB4 5JA

SEVEN SEAS

Jolly Roger is a single key press adventure, but don't let that put you off it; its quite different from the norm and, up to a point anyway, I was quite hooked.

The idea of the game is to find some buried treasure — for this you need six clues once

you have found the correct island.

Clues can be discovered by trading with natives of the large number of lesser islands you come across on your travels. To trade you will need something to trade with; ie, doubloons (what use these are to a native I know not — perhaps they eat them, peasant communities aren't what they were.)

Aside from all this, you must sail the seas and look after the state of the ship and your crew, the former needs to be kept in good repair, the latter need to be fed.

The graphics are fairly simple, but reasonable and if you want to try something a bit different this is a good bet.

Program *Jolly Roger*
Price £5.95
Micro *Spectrum*
Supplier *Video Vault*
140 High
Street West
Glossop
Derbyshire

MULTIPLE CHOICE

If you think that answering multiple choice questions on a variety of subjects is a sensible thing to do with a computer then *Mustermind* is for you.

It's a range of data tapes from Silas Software on, at the moment with more to come, English, Poems, Books, Stories and Plays.

What these data tapes provide is 20 questions of these subjects answered by pressing one of four keys — the questions aren't based on any particular syllabus so you couldn't legitimately say the program was educational. So if you simply want to answer multiple choice questions on your computer look no further...

Program *Mustermind*
Price £4.95
Micro *Spectrum*
Supplier *Silas Software*
24 Highcroft Gardens
London NW11

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, Popular Computing Weekly, 12-13 Little Newport Street, WC2R 3LD.

ZX81

- 1 (-) Asteroids (Quicksilva)
- 2 (8) Chess IK (Artic)
- 3 (7) Flight Simulation (Psion)
- 4 (-) Football Manager (Addictive Games)
- 5 (1) Krypton Ordeal (Novus)
- 6 (3) Planet Raider (Novus)
- 7 (6) Space Raiders (Psion)
- 8 (4) Walk the Plank (Novus)
- 9 (-) Scramble (Quicksilva)
- 10 (-) Alien Rain (CRL)

All 16K except where indicated † IE
(Figures compiled by Boots/Websters)

Vic20

- 1 (1) Computer War (Thorn EMI)
- 2 (9) Duck Shoot (Mastertronic)
- 3 (-) Submarine Commander (Thorn EMI)
- 4 (5) Flight 015 (Ferranti Craig)
- 5 (10) Tower of Evil (Thorn EMI)
- 6 (2) Tank Commander (Thorn EMI)
- 7 (7) Wizard and the Princess (Melbourne House)

- 8 (-) Undermine (Mastertronic)
 - 9 (-) 3D Maze (Mastertronic)
 - 10 (-) Snooker (Visions)
- (Figures compiled by Boots/Websters)

Commodore 64

- 1 (6) Snooker (Visions)
 - 2 (2) Beach Head (Centresoft)
 - 3 (-) BMX Racers (Mastertronic)
 - 4 (3) Solo Flight (Centresoft)
 - 5 (1) Manic Miner (Software Projects)
 - 6 (-) Orbitron (Mastertronic)
 - 7 (-) Stellar Wars (Commodore)
 - 8 (-) Harrier Attack (Durrell)
 - 9 (10) Revelation (Softel)
 - 10 (-) Hunchback (Ocean)
- (Figures compiled by Boots/Websters)

Dragon 32

- 1 (10) Hunchback (Ocean)
 - 2 (2) Cuthbert in Space (Microdeal)
 - 3 (6) Chuckie Egg (A&F)
 - 4 (5) Dragon Chess (Oasis)
 - 5 (3) Hungry Horace (Melbourne House)
 - 6 (1) Buzzard Bait (Microdeal)
 - 7 (-) Space Shuttle Simulator (Microdeal)
 - 8 (-) Kriegspiel (Beyond)
 - 9 (6) Mr Dig (Microdeal)
 - 10 (-) Dungeon Raid (Microdeal)
- (Figures compiled by Boots/Websters)

Books

- 1 (-) Commodore 64 Programmers' Reference Guide, Commodore (Commodore)
 - 2 (-) 60 Programs for the Commodore 64, Erskine et al (Pan)
 - 3 (-) Very Basic Basic — Commodore 64, Eilershaw and Schofield (Century)
 - 4 (-) Step by Step Spectrum Book 1, Graham (Doring Kinderley)
 - 5 (-) Sinclair QL Companion, Allan (Pitman)
 - 6 (-) Step by Step Spectrum Book 2, Graham (Doring Kinderley)
 - 7 (-) A Guide to Playing Hobbit, Elkan (Melbourne House)
 - 8 (-) 60 Programs for the Sinclair Spectrum, Erskine et al (Pan)
 - 9 (-) Commodore 64 Games Book, Bishop (Granada)
 - 10 (-) Step by Step Programming BBC Book 1 (Doring Kinderley)
- (Figures compiled by Bookwise)

Spectrum*

- 1 (2) Jet Set Willy (Software Projects)
- 2 (7) Jack and the Beanstalk (Thor)
- 3 (1) Match Point (Psion)
- 4 (-) Zaxxon (Starzone)
- 5 (5) Sabre Wulf (Ultimate)
- 6 (3) Fighter Pilot (Digital Integration)
- 7 (-) Lords of Midnight (Beyond)
- 8 (9) Trashman (New Generation)
- 9 (-) Paytron (Beyond)
- 10 (4) Blue Thunder (Foundry Systems)

*All 48K

(Figures supplied by W H Smith and Son, London)

Atari

- 1 (1) Bruce Lee (Datasoft)†
 - 2 (2) The Hulk (Adventure International)
 - 3 (3) Encounter (Mogren)†
 - 4 (-) Captain Sticky's Gold (English)
 - 5 (8) O'Riley's Mine (English)
 - 6 (5) Slinky (Cosmi)
 - 7 (8) Zaxxon (Datasoft)
 - 8 (-) Flak (Sunsoft)†
 - 9 (4) Sea Dragon (Adventure International)
 - 10 (-) Jetboot Jack (English)†
- † 32K cassette ‡ 48K Disc
(Figures compiled by Calisto Computers, 021 832 8458)

BBC

- 1 (1) Fortress (Pace)
- 2 (4) Overdrive (Superior)
- 3 (3) Aviator (Acornsoft)
- 4 (2) Micro Olympics (Database)
- 5 (-) Hunchback (Ocean)
- 6 (-) JCB Digger (Acornsoft)
- 7 (-) The Mine (Program Power)
- 8 (5) Spitfire Command (Superior)
- 9 (-) Jetpower Pac (Micro Power)
- 10 (-) Battle Tank (Superior)

(Figure compiled by W H Smith and Son, London)

REFERENCE

Advanced Machine Code Programming for the Commodore 64 is not a book for beginners — it deals in detail with the 6502/6510 processor discussing TTL logic gate operation, as well as the more usual areas of stacks, direct and indirect addressing and so on.

Appendices contain the instruction set, Ascii Codes, information on Hex to Decimal conversion. Certainly not suitable for the new owner but for others a useful reference work.

Book *Advanced Machine Code Programming for the Commodore 64*
Price £7.95

Micro *Commodore 64*
Supplier *Granada Technical Books*
Granada Publishing Ltd
8 Grafton Street
London W1X 3LA

GOOD GRIEF

It's funny how easily one gets strange ideas. Bernard Babani is a book publishers that specialises in pocket-sized computer books for a couple of pounds. Having also discovered that one of the companies' main authors is called Penfold — the name of Danger Mouses assistant who says 'good grief' a lot I am now firmly convinced that Bernard Babani must be a tiny little company in a tiny little office somewhere and feel immediately disposed to like its books. In fact, it may be part of some vast multinational publis-

hing house for all I know.

You should therefore view with suspicion my enthusiasm for *Micro Interfacing Circuits Book 1* — another little book from Babani. This is a book containing general advice as well as specific electrical information on connecting things into computers.

The book is definitely intended for people who have quite a reasonable degree of electrical knowledge rather than the merely curious.

Book *Micro Interfacing Circuits Book 1*

Price £2.25

Micro *General*

Supplier *Bernard Babani*
The Grampians
Shepherd's Bush Road
London W6 7NF

CHEAP

At under £100 the Dragon is definitely good value and there may be quite a lot of people who've just purchased one who could use *A Pocket Handbook for the Dragon*.

This short book is simply a collection of useful details arranged in an accessible way. Information is both straightforward facts — the screen arrangements for the various Pmodes, pins of the edge connector, etc.

Short but cheap, and genuinely useful, despite the rotter front cover.

Book *A Pocket Handbook for the Dragon*

Price £2.95

Micro *Dragon*

Supplier *Duckworth*
The Old Piano Factory
43 Gloucester Crescent
London NW1

This Week

Program	Type	Micro	Price	Supplier
The Night Sky	S	BBC	£9.90	Bridge
Beamrider	Arc	Commodore 64	£9.99	Activision
Blue Thunder	Arc	Commodore 64	£6.95	Richard Wilcox
Decathlon	Arc	Commodore 64	£9.99	Activision
H.E.R.O	Arc	Commodore 64	£9.99	Activision
Pitfall I	Arc	Commodore 64	£9.99	Activision
Pitfall II	Arc	Commodore 64	£9.99	Activision
River Raid	Arc	Commodore 64	£9.99	Activision
Toy Bizarre	Arc	Commodore 64	£9.99	Activision
Zenji	Arc	Commodore 64	£9.99	Activision
Strobe	S/Ut	Commodore 64	£1.99	SA Weir
Can You Count?	Ed	Oric	£3.95	Mellowsoft
Can You Spell?	Ed	Oric	£3.95	Mellowsoft
Catch-a-Key	Ed	Oric	£3.95	Mellowsoft
Hangman	Ed	Oric	£3.95	Mellowsoft
Picture Snap	Ed	Oric	£3.95	Mellowsoft
Play Maths	Ed	Oric	£3.95	Mellowsoft
Spell-a-Rhyme	Ed	Oric	£3.95	Mellowsoft

Tables Test	Ed	Oric	£3.95	Mellowsoft
Rapsallion	Ad	Spectrum	6.95	Bug-Byte
Moons of Tantalus	Arc	Spectrum	£6.45	Cornhill
Zapper	Arc	Spectrum	£2.99	Anco
Physics	Ed	Spectrum	£7.95	Longman
The Duke	Ut	Spectrum	5.95	M Alexander
Decimals	Ed	Vic20	£9.95	Chalksoft
Ephemeris	S	ZX81	£6.90	Bridge
Strobe	S/Ut	ZX81	£1.99	SA Weir

Key: Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



Name of the game

TV viewers who watch the ad breaks will have noticed lately a new campaign on their screens which suggests that no-one will soon have any problems getting to grips with that *bête noire* of the modern age, the microcomputer. Have no fear, suggests the ad; there is nothing to fear, because there is nothing to learn. Macintosh from Apple makes computers as easy as ABC. It kills computer languages dead, just as Bell's invention of the telephone killed Morse's code.

The campaign is filled out by full-page ads in the daily papers. One page in Morse code reads "Alexander Graham Bell has just invented the telephone". The next is a full page of computer code.

The third ad is the clincher. Disregarding gender difference in its sweeping claim of benefit for all humankind, the copyline proclaims "Apple has taught the machine about Man". The message is clear and effective. Don't strain your brain — just let the computer do the thinking.

It is a seductive message. Only grudgingly has the general public come to accept the computer. If you were in business, these little gadgets could well be useful. If you were a kid, there were some natty games to play. But the expense of life in learning how to use one was simply disproportionate. What use could this cumbersome, expensive and unreliable electronic box of tricks serve?

Now, however, the computer's proselytes are legion and vocal. The product is everywhere. No blame attaches to hating it; but no praise either. "Prove that I have a use for it" has given way to "Perhaps I could give it a try". It is in order to capture the uncommitted that Apple have cast their wide net. The lure is that you won't need to think about it. You don't want to think about it, do you? But if you could just start work with it, just like sticking a typewriter on the desk and hitting the keys, could you be tempted?

Firing up the machine is not so hard. The keyboard is familiar. The concept of keystrokes appearing as text on the screen can hardly deter any but the most determined ostrich. But seduced by your own rapid progress, it is hard not to get carried away by your own prowess, to make the machine do something — anything.

For the essence of Macintosh's "human-like" thinking lies in converting the operations of the computer into supposedly familiar images of the desktop. That the screen shows you is a load of doodles — "icons" — displayed in high-resolution graphics. A bunch of folders, empty unless you've already been at work. A clipboard. Plain paper. A notepad. A waste-bin. All the paraphernalia of cut-and-paste.

Is the desktop metaphor, derived from Xerox's work in Palo Alto on the Star system, desirable or useful? I would say no — on both counts the computer is being sold short. Let us examine Apple's claim that Macintosh makes computing easy. The screen image of human tasks makes learning how to use the computer intuitive, it is claimed. Every picture worth a thousand control codes. At first, the novice learns quickly. It's fun.

But in the long term work, work with a computer is not easy. You can never be less than explicit in what you want it to do. It won't intuit your thoughts, nor will it help you unscramble your balance sheet. If words are your business, all that iconography gets between your thoughts and their expression. If money is your game, you still have to understand financial analysis. Only the computer is easy: if your work is difficult, it will remain difficult.

Another major claim is that you may exchange data files among applications programs. But, like the screen icons, this is only useful at the presentation level. Much is made of the fact that you can import graphics from spreadsheet, print out the results in lots of different timesteps, etc. That is what the demos are all about. But is this useful? Yes — but only because the result — let us call it a management report — expresses "computing style". It is window-dressing.

If the report is duff the computer cannot enhance the feebleness of the content. And for the content to be good, to make use of the computer's true processing power, its operator must understand difficult and sometime tiresome concepts.

And this is where Apple's advertisements sell computing short. By suggesting, albeit indirectly, that the computer will do the thinking for you, it will sell a lot of computers. This is, of course, the name of the game.

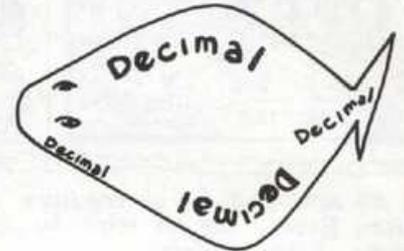
Martin Hay

Decimal place

Puzzle No 117

If you are looking for an excuse not to be out enjoying the good weather then try this.

The reciprocal of ninety-seven — as a decimal value — is 0.010309.



That's fine as far as it goes, but it only gives the value to the first few decimal places. What happens if we wanted to find the value to ten decimal places, or a hundred, or a million?

What is the value of the ninety-first decimal place?

Solution to Puzzle No 112

In each case £100 is deducted from each of the scores, the balance representing the actual amount won. The two *For-Next* loops represent the numbers of the two types of correct answers given, and variable *C* is the number of incorrect answers (the balance of the twenty questions). The score is then computed and printed if it agrees with any of the three scores obtained.

```
10 FOR A = 0 TO 20
20 FOR B = 0 TO 20
30 LET C = 20 - (A + B)
40 SCORE = 30 * A + 24 * B - 15 * C
50 IF SCORE = 368 OR SCORE = 381 OR SCORE = 102 THEN PRINT SCORE, A; B; C
60 NEXT B
70 NEXT A
```

So, the contestants results were: Arlene 7 difficult, 9 easy and 4 wrong; Darlene 3 difficult, 14 easy and 3 wrong; and Marlene 2 difficult, 8 easy and 10 wrong.

Winner of Puzzle No 112

The winner is John Brunson, Estcourt Road, Gloucester, who receives £10.

Rules

If the puzzle can be sensibly solved using a computer then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 117 is August 10.

The Hackers



LADY CLAIR IS HELPING THE PIMAN WITH HIS RÔLE IN THE FORTHCOMING PIROMANIA... (A HOT GAME FROM AUTOMATA)

... THEN WHILE HE'S MAKING WITH THE EXTINGUISHER, YOU'RE SETTING FIRE TO...

A BOTTLE!

I DON'T THINK MOLTEN COCKTAILS ACTUALLY COME INTO THIS GAME...

NO... A BOTTLE HAS JUST WASHED UP ON THE BEACH!

PIROMANIA PIMAN'S COPY

BIG DEAL! WE'RE SUPPOSED TO BE WORKING!

LOOK... A MESSAGE

'To Whom it may concerne: J. Crusoe, am stranded on a remote island, victim of a shipwreck...

"I am searching for ye treasure of William Bones, but am beset by ye nasty killer spiders....

YECH!

"His writings are coded, and I seem to spend most of ye day walking round and round ye volcano, getting nowhere hastily..."

"Bones himself is no company nor help, as he is no more than another bleached skeleton. Only he knew the secret of escape, but he perished... the silly perisher..."

the annual AUTOMATA adventure is here!

CRUSOE

for 48K SINCLAIR ZX SPECTRUM: MACHINE-CODE ANIMATED GRAPHIC & TEXT ADVENTURE. Free music flipside!!! by Dan DeJae & the Castaways. PROGRAM BY JON SMITH and artwork by Gremlin-Evans. Shipwrecked and stranded, on ye remote island, with nothing save a bottle of Granny's patent elixyr, an empty stomach, ye shorts that he stands up in ... and Thou. Ye Adventure is only just beginning. Enjoy it before it enjoys you.

PLEASE SEND ME "CRUSOE" for 48K Spectrum @ SIX QUID.

MY NAME.....

MY ADDRESS.....

.....POST CODE.....
 I ENCLOSE YE SUM OF £6 INCLUSIVE PRICE, or please DEBIT MY ACCESS / VISA CARD, number:-

send to: AUTOMATA U.K. LTD. 27 HIGHLAND ROAD, PORTSMOUTH, HANTS, PO4 9DA, ENGLAND, or phone our 24-HOUR CREDIT-CARD HOTLINE on 0705 - 735242.....

Gremlin Evans

YIKES!

"In ye water, I am plagued by jellyfish, whose flavours I like not, by George!!

"I have found an assortment of unusual objects whose purposes evade me. Please send help! Yours etc."

SHIRT OR SHIRT?

JOIN THE PIMANIACS

HEY THIS COULD MAKE A GREAT VIDEO GAME... LET'S SELL THE IDEA TO AUTOMATA!

IT SEEMS THERE MUST BE OTHER BOTTLES FLOATING ABOUT! CHAP CALLED JON SMITH'S DONE THAT... AUTOMATA HAVE RELEASED 'CRUSOE' ALREADY.

GADZOOKS! DOES THAT MEAN THERE IS HOPE FOR

CRUSOE

AND WILL FRIDAY EVER COME AROUND?

ORDER YOUR COPY OF THIS EXCITING, PERPLEXING & HILARIOUS NEW GAME, AND BY-PASS ROY PLOWLEY!