Home Computing WEEKLY

An Argus Specialist Publication

June 28-July 4, 1983 No. 17

38p

Make more of your ZX81 — see page 14

Software reviews for: TI-99/4A, Dragon, Oric-1, Jupiter Ace, Spectrum, ZX81, Commodore 64, VIC-20

Programs to type in for TI-99/4A, Dragon

Computer Fair: Special report

Pages of news

Your letters

Best sellers: Charts for VIC-20, ZX81, Spectrum, Dragon

Behind the scenes at Rabbit

PLUS: U.S. Scene and One Man's View

WHICH MICROS WILL SURVIVE THE HIGH STREET?

New computers — full details, plus pictures, inside

NEW computers are flooding into the country — eight were announced in the last few days. But how many will reach the shelves of the high street stores?

W.H. Smith has already decided to add two to its range — their names are being kept quiet for now — and Boots is due to make a decision in the next few weeks.

In fact merchandise controller Stewart Binnie, who has worked at Smiths for seven years, said he was watching the performance of two of the company's present range, but for different reasons.

He wanted to see the reaction to the £110 price cut for the Commodore 64, bringing it down to £229. It could go into more stores.

And he said: "We will have to see how the Oric performs over the next two-three months — it's been rather caught short by the recent round of price cuts."

Mr Binnie pointed out: "Computers are very extravagant in their use of store space. Anything that does not perform and soon will be replaced by one that will."

Smiths at present stock the ZX81, both Spectrum models, the Commodore 64 and the Oric. In the company's three test computer stores-within-stores there will be a range of eight or nine computers.

And he believed that the ZX81, now just under £40, was well placed for Christmas, despite its black and white display: "It's great strength is that it's a good way of getting started."

Mr Binnie said Smiths bought in detailed market research before considering which machines to consider and then took account of all the price segments.

He said: "The problem is that June and July are fallow months and these are when you have to make up your mind for Christmas.

Continued on page 3

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"What makes us different from the independent retailer is that someone as large as W.H. Smith has to have a very clear view of the market.

"I see hardware being subject to further erosion of margins in the next few months and the market is so competitive that retailers are at each other's throats."

Mr Binnie is expecting a bumper Christmas in computer sales — perhaps as much as double over last Christmas.

He said: "I've seen estimates of one to one-and-a-half million units being sold in 1983 — half of them in the last four months, including January."

How does Boots decide which computers to stock? Merchandise controller Anton Boyes said: "The decision is not dissimilar to whether we take a new shaver.

"The first thing is whether it appears to be an innovation and offers good value for money.

"Then we look at in detail with a technical evaluation for performance and safety — that's terribly important — and whether it does what it says it will do.

"Sometimes you see things at a trade show and it turns out that they are prototypes.

"We look at how the manufacturers are going to promote the computer and then finally we set it out in the range of our existing products.

"It would be unlikely that we would take a microcomputer whch did the same for the same price, although it may be we would have two at around the £170 mark.

"I must say the decision on which systems to stock this Christmas is one of the most difficult we have had to make. We are not committed to any at the moment, but we will be making a choice soon.

"I've never known anything like the market at present. Obviously it's critical that we pick the right product, especially as

Continued in column 4

FREE ZX81 CATALOGUE
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Software Supermarket

Continued from column 1

there are going to be many more products and more people selling them this Christmas."

Boots stocks the Spectrum, ZX81, Dragon, VIC-20 and Commodore 64 in 170 stores and is soon adding the BBC micro. Before Christmas 250 branches of Boots will be stocking computers.

How do the independent-schoose? Andrew Margolis, of Lion Micro, which has stores in London and Brighton, said: "It's as difficult for us to decide what to sell so it is for the customer to decide what to buy.

"The home computer market is in demand driven — it's what people come in and want to buy. When someone comes in it's difficult to persuade them to buy something other than a Sinclair or a BBC if that is what they came in for.

"To take a particular line you have got to invest money in stock and training and we can only afford to invest if it warrants it.

"We can't hype something in the same way as the big retail chains.

At least one new computer — possibly two — may make an appearance on the shelves of John Menzies stores.

Nick Gregory, the company's product manager for computers, said the decision would be made in the next week or so from the machines the company had already evaluated. But there may also still be room for an outstanding newcomer, he said.

The company took these items into acount: memory size, graphics and other major features, accessories and software, availability, support and promotion from the maker and publications — like books and magazines.

He said: "We take into account not only the box but what happens when the box is on the market."

John Menzies stocks computers in 109 stores and the top 20 have the whole range — ZX81, Spectrum, Dragon, Oric, Atari and VIC-20.

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By Andrew Hewson and John Hardman

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By Andrew Hewson

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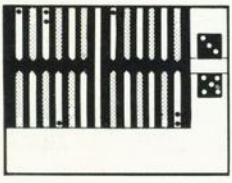

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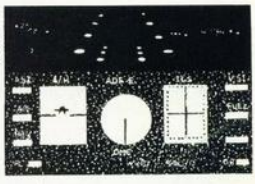

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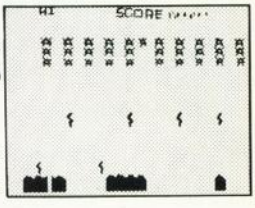

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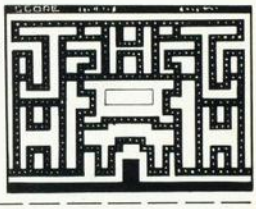

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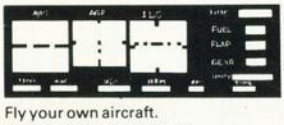

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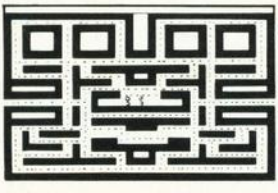

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Fair deal from fairs

The Computer Trades Association has hit out at badly-organised badly-publicised "rip-off" computer fairs.

According to the Association's general secretary Nigel Backhurst, "our members reckon that there are about a third too many exhibitions taking place at the moment.

"They get bombarded with invitations to show their products at exhibitions, and there's no way they have time to check them all out. My own business had mail shots for five different exhibitions only last week — and in an average week we get at least a couple."

To help its members decide which fair's fair, the association is in the process of compiling an Exhibitions Approval List. Exhibitions will have to meet certain basic standards to get on to the list.

Nigel Backhurst said, "The standards aren't rigid — we'll assess each exhibition as it comes. You can't compare local microfairs with big events like the Earl's Court fair.

"But the sort of thing we'll be looking for is whether there's adequate publicity, adequate security and safeguards for exhibitors, and whether there's an advisory committee set up to take exhibitor's views into account.

"It's also important that exhibitions should be aimed at the right market — there's a general feeling that too many exhibitors try to mix their markets. People don't know if they're home computer, business computer or general exhibitions."

Many of the culprits are small firms, although he said members were being advised not to exhibit at one show run by a large company.

The CTA now has 150 members. Dragon Data joined on June 20, and Boots is also to join.

Mr Backhurst stressed however that the CTA was not ordering its members to boycott non-approved events. The approved list would simply be a recommendation.

The list will be divided into four categories: trade only exhibitions, public (business), public (home/leisure), and public (general). The first edition will be published in September, with monthly updates appearing along with the Association's newsletter.

Members of the public will be able to get copies of the list by sending a stamped addressed envelope to Nigel Backhurst.

Computer Trade Association, 108 Margaret Street, Coalville, Leics LE6 2LX

Voltmace's new Delta 14 BBC handset

More high street micros

W.H. Smith is opening pilot computer shops-within-shops on Friday at its Birmingham, Croydon and Northampton stores.

As revealed in Home Computing Weekly, they will be test centres for a proposed network of such shops country-wide.

Each will have console units where prospective customers can try computers such as Mattel's new Aquarius, the BBC micro, Oric-1, Commodore 64, VIC-20, and Spectrum.

W.H. Smith, Strand House, 10 New Fetter Lane, London EC4A 1AD

Computer comic

Britain's first computer comic has just been launched. Called Load Runner, it appears fortnightly with a mixture of comic strips, feature stories and computer facts for the nine-16 age group.

Editor Bill Scolding said his aim was to entertain as well as educate.

Load Runner, 30-31 Islington Green, London N1 8BJ

Push-button games

You won't have to wear out your BBC computer keyboard by using it for games playing, if Voltmace's Delta 14 handset catches on.

The handset combines a joystick and a heavy-duty keypad which, according to Voltmace's sales director Tony Pearmain, is "tolerant to heavy pressure, such as is experienced when it's used by excited children playing games."

As well as saving your keyboard for programming, Voltmace says that the keypad will make it easier to control games which use several keys.

A single handset can be plugged directly into the A/D port at the back of the BBC micro, and used just like an ordinary joystick. Or two handsets can be plugged into an adaptor which allows the keypads to be used.

At the moment, of course, you won't be able to use the keypad with existing BBC software. Voltmace is busy trying to talk BBC programmers into writing optional keypad control into their future games — as well as routines that will transfer existing software to the handset.

The handsets alone cost £10.95 each, and the adaptor box costs £13.95.

Voltmace, Park Drive, Baldock, Herts SG7 6EW

Fantasia fiasco

Brian Howarth was worried when he read in Home Computing Weekly that tape swap company Computerhouse was to set up a software subsidiary called Fantasia.

Because Brian's own software company, whch has been around for a year now, is called Digital Fantasia — but it has nothing to do with Computerhouse.

"The names really are pretty similar", Brian said. "I just hope people don't get the two companies confused. I'll be writing to Mr Martin pointing out that we already operate under the name Fantasia."

Digital Fantasia's forte is machine-code adventures for the BBC. Called the Mysterious Adventures series, the games were all written by Brian himself. But within six weeks Brian hopes to release the whole series for the 48K Spectrum.

Digital Fantasia, 24 Norbreck Road, Blackpool, Lancs

Power with stability

Disturbed by mains voltage disturbances? Browned off by brownout and screen drift? If it's important to you to ensure that your micro gets a stable power supply, then Cetronics has a range of mains transformers that may do the trick.

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SILICA SHOP

FREE LITERATURE

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Name .....

Address .....

.....

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Postcode .....

Home Computing Weekly
HCW1783

When the playing has to stop

In these columns and in the letters page of Home Computing Weekly, there has been much soul-searching about the role of computer games. Are they just a waste of time? Should you feel guilty about playing them? Are they even (as one man suggested) a threat to the whole home computer market? Or, to go to the other extreme, are they the best thing since sliced bread?

Speaking as a professional progammer who works on mainframes during the day and uses a microcomputer in my spare time, I'd answer no to all these suggestions.

Games are a great way to introduce children and adults alike to computers — from micros right up to mainframes. They can give you an appreciation of what the machine can do. They can familiarise you with the keyboard. And they can help to take away the fear of computerisation — a fear which professional programmers, by shrouding the subject in jargon and mystigue, must be at least partly responsible for engendering.

Even professionals sometimes play computer games — to relieve the strain of programming to the unrealistically tight schedules laid down by their non-computing clients!

But games have their limitations. To use the power of even a Spectrum just for playing games is a bit like using an atom bomb to crack a nut. And £150, which is about the price of the Spectrum plus a tape recorder, is not peanuts — it's some people's gross pay for a week. Would you pay a painter £150 to paint your house if all he did was stand around bouncing a ball?

In any case, if the reactions of my own children are anything to go by, games lose their appeal in a comparatively short time — in about six months on average.

At this point, sensible parents will leap in and encourage their children to start using their micro in a useful way. Once kids realise the possibilities the micro holds for lightening their homework burden, or helping with revision, they will soon begin to use it to the full. From then on, they'll just go back to playing games on it for odd moments.

Most schools now have at least one microcomputer. My youngest son's school bought eight micros in 1979 and hasn't looked back since. You can be sure that, whatever these micros are being used for all day, it isn't just for playing games.

A lot of my neighbours have gone past the games-playing stage and are now using their micros more fully. One uses the micro to control household functions. One lad uses the home computer to control his train set. Another — an accountant — says he keeps all his clients' records on his home micro.

I think the biggest barrier to using micros constructively is not games, but this beastly hybrid language Basic. Its limitations, and the need to play around with PEEKs and POKEs, make it well-nigh impossible to carry out the simplest programming task in less than a dozen lines. You get there in the end, but at a cost of time and effort which makes it uneconomic for commercial programs.

By all means learn Basic as a standby, but if you want to push your micro to its limits, machine code is the way to do it. Not only will your micro respond better to machine code — it's even easier to understand and learn it too.

R.H. Hill
Programmer
Woodford Green, Essex

● **This space is for you to sound off about the micro scene, to present bouquets or to hurl brickbats. Share your views by sending them to Paul Liptrot, Opinion, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Please include your occupation and your interest in computing.**

Lynx has more memory

Making its first public appearance at the Earls Court Computer Fair was the 96K version of the Lynx, which should be available from retailers now at a price of £299.

You can't actually use all 96K for programs, though. The Lynx's high-resolution graphicstake up 32K, leaving around 61K for machine-code programs and around 37K for Basic programs. For comparison, the 48K Lynx allows the user 13.75K of RAM for Basic programs.

The bigger Lynx has more ROM, too — 4K of it. This extra ROM is needed for new features: drivers for both parallel and serial printers, pre-formatted sound effects, a CIRCLE command, and a command that lets you use the 24K of machine code accessible RAM to store data for Basic programs.

Owners of 48K Lynxes can upgrade their machines to 96K for £89.95.

Camputers, 36a Hills Road, Cambridge CB2 1LA

Plug-in games for your VIC

Not to be outdone by Thorn-EMI, Commodore has also announced the release of five new cartridge games for the VIC.

The first and most expensive is Gorf, claimed by Commodore to be the first time this arcade game has been available for a home computer. It costs £24.95, but contains four different space adventures, and you have to complete one before moving on to the next.

Then there's Cosmic Jailbreak, in which you take the role of a cosmic prison warden, Cosmic Cruncher, which challenges you to destroy alien satellites, Menagerie, a version of frogger with fleas and animals instead of frogs and logs, and Money Wars, in which you take the money and run. They all cost £19.95.

Commodore, 675 Ajax Avenue, Slough, Berks SL1 4BG

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"If more programs shared the quality of OMNICALC, then we might see more Spectrums in offices." Home Computing Weekly 3/5/83

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Cutting remarks

It may not be your magazine that is guilty, but I am sure that I read a letter from a consumer recently who was expressing displeasure at the current price cutting war in the microcomputer market.

What kind of fool is he? Doesn't he realise that a price cutting war benefits everyone, and prevents the market from getting stagnant?

A good example of a stagnant market is the one for Atari 400/800 software. A good program will cost you £30. A bad one will be about £15 cheaper. Yet does anyone seriously believe that the programming skills used to produce an £8 Spectrum program are any less than those used for Atari programs?

For some reason, people seem to think they can charge the earth for any Atari program. Presumably this is because Atari themselves have set a trend.

We've all heard the undenied rumours about the ZX81 only costing £10 build, or the Commodore 64 costing less than the VIC-20, so why are people so keen to line the pockets off faceless businessmen? I'm certainly not. Let battle commence!

Ian McLaughlin, Middlesbrough, Cleveland

★ *Software winner*

Munch Maze amendments

I am the owner of a VIC-20. I was very pleased to see the Munch Maze game in HCW 9 — it ran very well with great graphics.

But I didn't like the two-part business, so I loaded and ran the first part, then without NEWing it I loading the second part, and the game still worked.

Next I decided to make it more confortable for the user by getting the computer to load part two. If you use the following amendments when you load and run Munch Maze, the second part loads automatically:

```
93 Poke 36879,27: Print
'' CLR
LOAD'' + CHR$(34) + "Munch
Maze Part 2" + CHR$ (34) +
" "
94 Print " 4 cursor
down RUN"
```

And add the following line:

```
95 Poke 198,3: Poke 632,19:
Poke 633,13: Poke 634,13
```

Amith Cabraal, Sidcup, Kent

Send your letter to Letters, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Don't forget to name your computer — the best letter could win £5 worth of software. Queries cannot be answered on this page

Hands off the dragon

Who does he think he is? I am of course talking about your reviewer N.W., who chose to walk the path of the Knight's Quest in HCW 15. As soon as he found the dragon, he killed it. What's more, he boasted that it was easy.

Well, of course it was easy to kill the dragon, as it was expecting to be fed, not killed. If N.W. had taken heed of the instructions at the start of his quest, he would have read that dragons are not much use when they are dead — silly boy.

Although it is commonly believed that the only good dragon is a dead one, it just isn't true in this case. N.W. would have found that he could not move the giant or board the ferry or even use his book of spells without the dragon as his friend.

Obviously N.W. is a novice adventurer, and can be forgiven his dragon slaying. But don't let it happen again.

One final word. This adventure must have each task completed before the next can be attempted, unlike some which let you progress to the next stage, only to tell you that you have not got the correct equipment.

T. Kemp, Norwich, Norfolk

Spectrum user club

I haven't seen any Spectrum User Clubs anywhere, so I've decided to start my own with the help of a friend of mine.

It will cost £4.60 a year, and in that year members will receive six issues of our magazine — one every two months.

Mark Burnett, 24 Inverness Drive, Hainault, Ilford, Essex

It isn't microfair

Why oh why is there never a microfair in Scotland? The fairs in England are too far away for us to get to. What's wrong with an Edinburgh Microfair or even a Glasgow microfair?

If anyone reading this has an answer to this mystery, perhaps they'd write in and let us all know...

M. Logan, Hawick, Scotland

Microdrive shaped like a credit card

If you're fed up with the slowness of cassette players and you can't afford a disc drive then help is on the way. There is a new data storage format which will shortly be available for home computers.

It is called the "wafer" and is a relative of the data cassette. The wafer is an endless loop tape which is a sixteenth of an inch thick and is housed in a small cassette-like case about the size of a credit card. The tape itself is made up of high grade video tape cut very small.

The tape comes in various lengths from five to 50 feet in five foot increments. The tape zips past the record/playback head of a specially designed recorder/player at 10 inches per second, as opposed to conventional cassette speed of one and seven-eights inches per second. A 50 ft tape can store up to 128K!

Retail list price for the required recorders will only be $100, not so much more than certain home computer companies are now asking for their own data cassette machines.

The manufacturer of this new system is calling it the Microdrive, and calling the wafers Microwafers. The retail price of the wafers is expected to be in the three to five dollar range. A 32K program can be expected to load in about 15 seconds, as opposed to abut seven seconds from a disc.

Texas Instruments and Coleco have already committed themselves to the new system.

TI is expected to market its Microdrive very shortly, although they may use another name. Coleco has already brought out its Super Game Expansion Module No. 3 with a built-in Microdrive and two games included, Super Donkey Kong and Super Gorf. The advertising claims that this module will provide "realistic arcade game play." Coleco has 32K built into their machine, which is quite a lot for a machine that can only play games.

Right now, the Microdrive is otherwise unavailable, but this situation will change in the next few months. Look for the upcoming ads. Otherwise I will keep you posted on price, availability, and vendors.

★★★★

Marketed under the TI name comes the Expander. This interesting device makes possible voice recognition and speech synthesis for TI's model 99/4A. The unit includes a 64-position membrane keypad and has a slot for accepting game cartridges. It includes a three-axis joystick and a combination headset-microphone unit for quiet input and output. An accompanying joystick controller has three buttons which can be used for controlling special functions. No price yet.

★★★★

Finally, the Winky Board II is a little cassette interface device for Timex Sinclair computers that automatically filters out stray electrical glitches that would otherwise cause a bad load, resulting in easier program loading. It has an LED volume indicator, is capable of saving a program to two cassette recorders at once, and comes with a program enabling the user to make backup copies of programs in memory. The unit requires no external power source or any hardware modifications. It costs $24 and is available from G. Russell Electronics, RD 1, Box 539, Centre Hall PA, 16828.

That's all for this week.

Bud Izen
Fairfield, California

Top Twenty programs for the Spectrum

1	Flight Simulation	Psion (1)
2	Penetrator	Melbourne House (3)
3	Transylvanian Tower	Richard Shepherd (4)
4	Jet Pac	Ultimate (2)
5	The Hobbit	Melbourne House (5)
6	3D Tanx	dk'tronics (6)
7	Horace Goes Skiing	Psion/M. House (8)
8	Ah Diddums	Imagine (7)
9	Orbiter	Silversoft (11)
10	Arcadia	Imagine (9)
11	Chess	Psion (12)
12	Hungry Horace	Psion/M. House (10)
13	Test Match	Computer Rentals (14)
14	Ground Attack	Silversoft (13)
15	3D Tunnel	New Generation (18)
16	Time Gate	Quicksilva (19)
17	Galaxians	Artic (–)
18	Space Raiders	Psion (15)
19	Planetoids	Psion (–)
20	Football Manager	Addictive (16)

Compiled by W. H. Smith. Figures in brackets are last week's positions

Top Ten programs for the Dragon-32

1	The King	Microdeal (1)
2	Space Wars	Microdeal (2)
3	Planet Invasion	Microdeal (4)
4	Katerpillar Attack	Microdeal (3)
5	Dragon Trek	Salamander (5)
6	Madness & Minotaur	Dragon (9)
7	Grand Prix	Salamander (–)
8	Alcatraz II	Microdeal (6)
9	Chess	Dragon (10)
10	Basic Tutorial	Ampalsoft (–)

Compiled by Boots. Figures in brackets are last week's positions

Top Ten programs for the VIC-20

1	Panic	Bug Byte (2)
2	Wacky Waiters	Imagine (3)
3	Arcadia	Imagine (5)
4	Cosmiads	Bug Byte (7)
5	Intro to Basic 1	Commodore (1)
6	Asteroids	Bug Byte (4)
7	Amok	Audiogenic (6)
8	Catcha Snatcha	Imagine (–)
9	Alien Blitz	Audiogenic (8)
10	Intro to Basic 2	Commodore (–)

Compiled by Boots. Figures in brackets are last week's positions

Top Ten programs for the ZX81

1	3D Monster Maze	New Generation (1)
2	Flight Simulation	Psion (2)
3	QS Scramble	Quicksilva (4)
4	Alien Dropout	Silversoft (7)
5	Galaxians	Artic (5)
6	Chess	Psion (3)
7	10 Games for 1K	J K Greye (9)
8	Asteroids	Silversoft (–)
9	Avenger	Abacus (8)
10	Night Gunner	Digital Integration (–)

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Games that are out of this world

Or are they? Our reviewers beam down their opinions on a selection of space games

Lunar Lander TI-99/4A £8

Stainless Software, 10 Alstone Road, Stockport, Cheshire, SK4 5AH

A version of the arcade game in which you must safely land in a valley, avoiding the rocky mountainsides. You have the choice of five venues each becoming more formidable as the local gravity increases. When you finally come down to Earth, which is the most difficult, there is the additional hazard of a lake.

The keyboard is used to control your descent by the spin and variable thrust of your lander. These require careful and constant adjustment. Instrument readings are displayed at the top of the screen.

The action is slow — a limitation of any program written in TI Basic — but this in no way detracts from the game. The more experienced player can turn the readings off thereby speeding everything up.

Two minor points are that the Y character has been mis-assigned to a blue block, and poor navigators might displace parts of readings.

J.W.

instructions	80%
playability	70%
graphics	70%
value for money	70%

★ ★ ★

Starjammer Dragon + joystick £7.95

Salamander, Dept C, 27 Ditchling Rise, Brighton BN1 4QL

Here we have a very colourful space dogfight by Franklin Frogstar (is this guy for real?). You are out to destroy an alien fleet intruding into your galaxy.

Your laser sight is in the centre of the screen and you steer the enemy into this with your joystick. A nice funnelling effect is produced with the stars although larger heavenly bodies remain curiously static.

A limited amount of energy, indicated at the bottom of the screen, protects you from enemy fire at a distance. If you're slow this is soon used up, even though you do have three lives.

The explosions are terrific and the graphic representation of enemy fighter and backgrounds quite good. At the end of each game there's a Roll of Honour to enter up to 10 high scores — essential in my competitive family.

M.P.

instructions	90%
playability	90%
graphics	90%
value for money	85%

★ ★ ★ ★

Invaders Jupiter Ace £6.50

Hi-Tech Microsoft, 42 Cranleigh Drive, Whitfield, Dover, Kent

Feeble version of the well-worn arcade game. No colour, of course, but on a machine with user-defined graphics the invaders ought not to be just white squares and oblongs or the defender's gun merely a small square.

The bombs fall so slowly and jerkily the program might as well be in BASIC and there is no synchronisation between the gunfire and the destruction of the invaders.

If it were not for the increasing but meaningless score in the bottom left hand corner you'd hardly known they'd been zapped. They present so little threat to the player that most people will end up feeling sorry for them!

The program was very difficult to load and came along with three others from the same supplier which totally resisted all attempts. The Ace would put up the dictionary notice but firmly refused to say "OK" — maybe the smart machine was trying to complain about the misuse of its potential.

G.M.

instructions	50%
playability	10%
graphics	10%
value for money	5%

Oric Trek Oric-1 48K £9.95

Salamander, Dept C, 27 Ditchling Rise, Brighton BN1 4QL

It just goes to show that an old idea can still inspire good games. The Klingons are stirring up trouble again and you with your faithful Enterprise crew are called in to sort them out.

The galaxy has supernovas and black-holes, some of the Klingons sport the latest in tractor-beams while Uhura keeps you informed of the news from Starfleet Command. The damage control is nicely done.

Another novel idea is the abandon ship option, a last resort in which you are reprimanded for cowardice and placed in command of a suitably weaker ship. You can at least continue where you left off though.

The screen display is neat and pleasing to look at, but the sound is a bit weak, with too much reliance upon the Oric's pre-programmed repertoire.

Oric-Trek is a real time game so there's no agonising over what to do — it's kill or be killed.

G.P.

instructions	85%
playability	90%
graphics	85%
value for money	65%

★ ★ ★ ★

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- ★ Extra BASIC commands for screen control
- ★ About 19,500 bytes available for BASIC programs
- ★ Load and save programs and use printer normally
- ★ Return to standard display mode at any time
- ★ Graphics and text can be mixed on the screen

We firmly believe that HI-RES is the most useful and powerful software item you can obtain for your DRAGON 32 computer.
HI-RES does not invalidate any programs you have written so far, although you will find that they can be enhanced to take advantage of your new BIG screen — over twice the capacity of the existing screen.

How easy is HI-RES to use?
Just plug the cartridge in, switch on your computer and HI-RES will be in action. You will wonder how you ever managed before HI-RES was around.

What about Graphics?
HI-RES allows Sprite graphics which are not available on a standard DRAGON 32. If the entire character set is used then over two hundred sprites can be defined in a single program! The BASIC graphics functions work directly on the HI-RES screen allowing you to mix text and drawings. HI-RES allows two colours, green and white, in both normal (black on colour) and inverted (colour on black) mode.

What extra commands do I get?
HI-RES implements two extra PRINT statements to allow normal and sprite printing on its big screen. Extra functions (about twenty) have been added to the CLS command. These allow you to change character sets, switch the cursor on and off, underline text and more . . .

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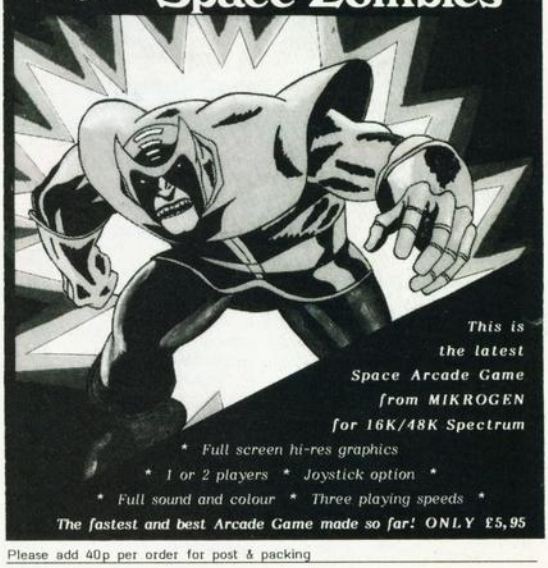

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Old favourites get a face-lift

These programs are all versions of traditional games, converted to play on your micro

Super Skill Hangman Dragon £7.95

Salamander Software, 27 Ditchling Rise, Brighton BN1 4QL

An excellent version of the standard word game for one or two players.

The computer selects a word at random out of a vast selection. If you guess the word in time you score a point; if you fail you lose a life. When you have lost thre lives the game is over. The computer adjusts your skill level depending on how many guesses are taken for each word.

There are three levels of help — one gives the first letter, two gives a random letter and three gives no help at all. No help means just that, and it is possible to hang the man by simply pressing the same wrong letter over and over.

There is an option to play with the timer on. With this you have a 30-second time limit to guess each word.

J.M.

instructions	75%
playability	75%
graphics	85%
value for money	85%

★ ★ ★ ★

Scrabble 48K Spectrum £15.95

Psion, 2 Huntsworth Mews, Gloucester Place, London NW1 6DD

Writing a home computer version of Scrabble might seem like an impossibility, but Psion has got 90 per cent of the way there. Up to four players can play, and all or none of them can be the computer. There are four skill levels (and hence four speeds), and the program beat me on level 2.

Besides all the permutations of players and skill levels, there are several other options, and good display, and a booklet which explains both the game rules and the program's operation. Too easy for the real Scrabble fanatic, perhaps, but for most of us a unique and fascinating program.

R.E.

instructions	95%
playability	96%
graphics	87%
value for money	95%

★ ★ ★ ★ ★

Backgammon 16K ZX81 £5.95

Psion, 2 Huntsworth Mews, Gloucester Place, London NW1 6DD

I'm no great shakes at backgammon, so this program suited me fine — it played a serious game, didn't get impatient, and never made rude remarks about my skill.

The screen display is uncluttered and easy to use, with the dice simulated at the bottom of the screen.

To move you just type in the letter corresponding to the position you want to go to — the computer does the rest. Illegal moves are refused, with reasons. There's also a "doubling cube" facility for those who like to gamble.

Four levels are offered, and on the simplest, the ZX81 occasionally made a move which even I thought a bit silly. The other levels take longer, but on each you have the choice of fast or slow modes.

C.C-R.

instructions	90%
playability	80%
graphics	70%
value for money	85%

★ ★ ★ ★

even a modified display if you have a monochrome TV.

Being able to see the players' letters makes it less of a gamble to change letters. You can opt to see the computer's letters or not — and you can also watch it trying out different moves if you want.

About 11,000 words are held in the program's dictionary — not a lot compared to the Oxford Dictionary, but pretty good for a Spectrum. Each time you enter a word it's checked against the list, and if no match is found, the computer asks. "Are you sure about...?" Type Y for yes and it takes your word for it; a great temptation to cheat if you're losing.

Excellent error trapping, a

Othello 48K Oric 1 £6.50

Kenema, 1 Marlborough Drive, Worle, Avon

Also known as Reversi, this game involves the capture of opponent's pieces by reversing them to your colour. The aim is to get more of your counters on the board by the end of the game than your opponent. In this version you can play against a friend, against the computer, or watch as the computer plays itself.

My copy suffered from loading difficulties (even though it was saved at 300 baud), and despite several attempts I couldn't obtain the on-screen instructions without crashing it.

The display is well laid out, but I fear the sound effects are a little overdone for a "thinking" program. ZAPs when reversing pieces. PINGs at the end of a move, and a rising scale while the Oric is thinking.

The computer's thinking time is in fact painfully slow, and to have the computer play itself soon gets very boring. Luckily, a human can intervene at any stage.

D.N.

instructions	20%
playability	70%
graphics	80%
value for money	70%

★ ★ ★

How to add new commands to your ZX81

Make up for some of the ZX81's omissions. David Nowotnik has done the work for you

Soon after the launch of the ZX81, there was a rumour circulating that the BASIC commands READ, DATA, and RESTORE were included on the original design specification of the ZX81, but these had to be dropped through lack of space on the 8K ROM.

While the omission has not caused many problems to programmers, there are circumstances when their absence has meant that valuable RAM space cannot be used economically.

One example is in filling a large array with data stored in a program. Without READ/DATA, the usual method is to have one LET statement for each element of the array — and that can consume a lot of space!

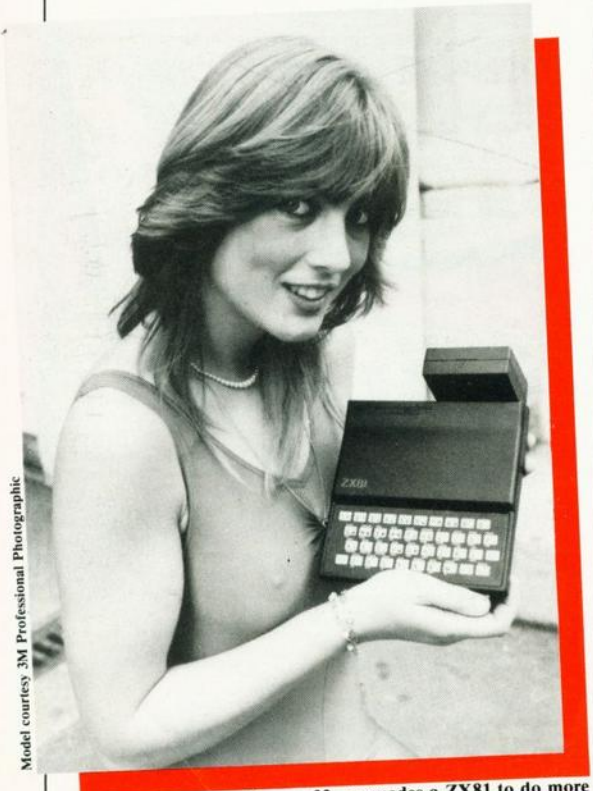
To overcome this problem, I wrote two machine code routines to imitate READ and RESTORE.

The assembly language listing of these routines is shown in **Table 1.** The total length of these routines is 128 bytes; they are stored in one REM line. This REM statement MUST be the first line of the program. **Table 2** contains a hexloader, which places the machine code into the dummy REM line (line 1), which starts by containing 132 full stops.

The numbers to enter using this routine are shown in the hex dump (**Table3**). The hex numbers also appear in Table 1, so you can check that you are entering them in the correct order. In using the hex loader, enter one pair of hex digits for each INPUT prompt; enter S to stop. Line 6 prevents you accidentally placing numbers into bytes which are not full stops.

Once you have entered all the machine code, delete all lines except line 1, then enter the program lines in **Table 4.**

In most other computers, READ works by searching through a program from the beginning until a DATA line is found. The first number or word after DATA is read, and stored for future use as a variable. The next time READ is used, the next number or word is read, and so on.



Model courtesy 3M Professional Photographic

Karen Lewer, 22, persuades a ZX81 to do more

Table 1 — assembly language listing

```
RE-     LD HL,16516          218440   loads the address
STORE   LD (HL),L            75       16516 into 16516
        INC HL               23       (search start address)
        LD (HL),H            74       and zero into 16518
        INC HL               23       to indicate outside
        LD (HL),0            3600     a data line
        RET                  C9
 READ   LD HL,(16516)        2A8440   Load the search address
        LD A,(16518)         3A8640   into HL, and the data line
        AND A                A7       indicator into A. Do not
        JR NZ,to DATA FND    2018     search if in DATA line
SEARCH  LD A,(HL)            7E       Search for a REM
REM?    CP 234               FEEA
        JR Z, to REM FND     2803
        INC HL               23       If not, look at the
        JR to SEARCH         18F8     the next byte
REM     INC HL               23       REM found; is the next
FND     LD A,(HL)            7E       byte an inverse space?
        CP 128                FE80
        JR Z, to ERROR       283C     yes, then out of data error.
        CP 8                 FE08     if not CHR$ 8, then carry on
        JR NZ, to REM?       20EF     searching for a DATA line
        INC HL               23       The next DATA line has been
        LD A,1               3E01     found; set data indicator to
        LD (16518),A         328640   one.
DATA    EX DE,HL             EB
FOUND   LD HL,(16400)        2A1040   load HL with the address of
        LD BC,6              010600   A$(1)
        ADD HL,BC            09
        EX DE,HL             EB       Transfer to DE
        LD A,0               3E00     Load the character counter
        LD (16519),A         328740   with zero
LOOP    LD A,(HL)            7E       A has the next character
        CP 26                FE1A     Is it a comma?
        JR Z, to COMMA FND   2813
        CP 118               FE76     or a NEWLINE character?
        JR Z, to N/L FND     280A
        LDI                  EDA0     If neither, transfer to A$
        PUSH HL              E5
        LD HL,16519          218740
        INC (HL)             34       Increment the character
                                      counter
        POP HL               E1
        JR to LOOP           18ED     Collect the next character
N/L     LD A,0               3E00     Set data line indicator
FND     LD (16518),A         328640   to zero
COMMA   INC HL               23       Place the next address
FND     LD (16516),HL        228440   in the address store
        LD B,0               0600     Set BC equal to the number
        LD HL,16519          218740   of characters for
        LD C,(HL)            4E       the return to BASIC
        RET                  C9
ERROR   NOP                  00
        LD HL,(16396)        2A0C40   Load HL with D-file
        LD BC,760            01F802   and add 760 to take HL to
        ADD HL,BC            09       line 23 of the screen
        EX DE,HL             EB       place this address in DE
LD HL,16645          21FB40   Load HL with the address of
LD BC,17             011100   the error message, BC with
LDIR                 EDB0     no. of bytes in message;
                              print the message
CALL 16520           CD8840   error message; call RESTORE
JR to READ           1898     and  jump back to READ
NOP                  00
The next 17 bytes carry the 'OUT OF DATA ERROR' message.
```

Table 2 — hex loader

```
1 REM.....
2 LET X=16514
3 INPUTA$
4 IF A$="S"THEN STOP
5 LET J=16*(CODEA$-28)+CODEA$(2)-28
6 IFPEEKX=27THENPOKEX,J
7 LETX=X+1
8 GOTO 3
```

A DATA line can contain several words or numbers; each item is separated by a comma. Once you come to the end of a DATA line, READ will search for the next DATA statement in a program. If you try to READ more items of data than are present, you should get a system error message. RESTORE resets the data search 'pointer' to the beginning of the program.

My routine works in much the same way. Instead of commands READ and RESTORE, numeric variables with these names are delcared (Table 4) which hold the addresses of the appropriate machine code routine. RESTORE is mimicked by the program line:

Table 4 — READ/RESTORE in-itialisation routine

```
  1 REM
 10 CLEAR
 20 DIM A$(32)
 30 LET READ=16530
 40 LET RESTORE=16520
 50 RAND USR RESTORE
9999 REM■
```

RAND USR RESTORE

There are two versions of the READ command, one for numeric, and one for string data. Typical examples of these are:

string: 100 LET C$ = A$(TO RAND USR READ)

numeric: 100 LET C = VALA$ (TO RAND USR READ)

C = VALA$(TO RAND USR READ)

Data is stored in a special REM line. To differentiate it from a normal REM, REM is followed by a graphic shift A (CHR$ 8). The machine code routine recognises this combination as a DATA command.

Line 9999 (table 4) contains a REM command followed by an inverse space character (CHR$ 128). This allows the routine to recognise the end of the program. Should you try to READ more data than is present, the machine code routine recognises the end of program marker, and prints the message 'OUT OF DATA ERROR' at the base of the screen.

An automatic RESTORE then occurs to prevent the program crashing.

The combination of CLEAR and DIM A$(32) in table 4 ensures that A$ is the first variable in the variables storage area of RAM.

The machine code depends on this; it uses A$ as a temporary store. A$ should be dimensioned to at least the length of the longest DATA item.

When you have entered the machine code, try LISTing the program. All you will get is: 1 REM.

The rest of the program is masked. The reason for this is the first two bytes after the REM; they have the hex value 76, which is the NEWLINE character. The combination of two together fools the LIST command into believing the end of the program has been reached.

You can list the rest of the program with LIST 2.

As a short example of how to use this routine, add the program lines in table 6 to those in table 5, then RUN. After that, change the first data item in line 160 to 6. This will demonstrate how the 'out of data' trap works.

Note that you can mix numeric and string data in one data line. Unlike the Spectrum, quote marks are not required for string data.

Table 5 — an example of READ/DATA

```
100 LET C=VALA$(TO RAND USR READ)
110 DIM Z$(C,10)
120 FOR I=1 TO C
130 LET Z$(I)=A$(TO RAND USR READ)
150 PRINT Z$(I)
160 NEXT I
170 REM▒ 5,ONE,TWO,THREE,FOUR,FIVE
```

Table 3 — machine code hex listing

```
76 76 00 00 00 00 21 84 40 75 23 74 23 36 00 C9 2A 84 40 3A 86 40 A7 20
18 7E FE EA 28 03 23 18 F8 23 7E FE 80 28 3C FE 08 20 EF 23 3E 01 32 86
40 EB 2A 10 40 01 06 00 09 EB 3E 00 32 87 40 7E FE 1A 28 13 FE 76 28 0A
ED A0 E5 21 87 40 34 E1 18 ED 3E 00 32 86 40 23 22 84 40 06 00 21 87 40
4E C9 00 2A 0C 40 01 F8 02 09 EB 21 FB 40 01 11 00 ED B0 CD 88 40 18 98
00 34 3A 39 00 34 2B 00 29 26 39 26 00 2A 37 37 34 37
```

How's your memory? It needs to be good to escape from the maze

You've got just 15 seconds to memorise the location of the doors in John Powers's game for the standard TI-99/4A. And time gets shorter as your memory improves

How it works

40-100 define characters
120-170 set colours
200-370 lays out screen, prints score, GOSUB to walls lay out
380-400 print indicator showing level
430-460 wait for key press, check if maze finished
480-590 check E pressed, test for fruit ahead, move upwards and beep
610-720 as above, except key X, move down
740-840 key S pressed. Check for invisible door, moves through if there is GOSUBS score increment, or decrement if no door.
860-910 routine for printing on screen
930-1170 set flash time according to level draw walls and places random doors
1180-1340 randomise to see of to print fruit check if fruit all used if not, GOSUB print fruit.
1270-1340 Print fruit.
1360-1450 Effects for eating fruit increase score
1470-1580 flash openings in wall for set time
1600-1700 effects for moving through opening
1720-1830 same for failing to find opening correctly
1850-1980 game finished, check score
2000-2150 game over, replay opportunity
2170-2260 new maze, score good enough
2280-2340 variables set-up

Variables

Z row of print position
V columns of print position
G level
CL column of figure
RW row of figure
GC ASCII code from GCHAR
CT column position of walls
RA/RB position of doors in walls
COUNT number of fruit on screen
BF number of fruit available
FI random position of fruit
SC score
M$ screen messages

In this game, you have to guide a figure through a maze — but it's not as easy as it sounds!

A number of vertical walls are printed down the screen, with channels in between. Random doors are set into each wall.

These openings in the walls flash for a set period of time at the beginning of the game, during which you must memorise their locations.

After 15 seconds (on the easiest level) the doors close up. You must now guide your figure across the screen using keys S and X to move up and down and E to try to move through the now invisible holes in the walls.

The figure leaves a trail behind him. For each door you successfuly pass through, your score increases by 100. If you try to pass through where there is no door you lose 35 points.

When you eat a fruit (placed randomly in the maze), the doors become visible for five seconds and you score bonus points.

There are three levels of skill. An indicator at top left shows you current level, you pass onto the next level automatically if your score is high enough. The game is farily easy to play at the lowest level but it takes a good deal of skill to navigate your way around the harder mazes.

Hints on conversion

If you would like to try to convert this program to another machine, remember that the Texas has a 24 by 32 screen, and a good amount of space can be saved by using multiple line statements — the program only takes up 5½K anyway — not available on the standard TI.

Here are the more unusual commands:

CALL KEY(M,K,S) Where K is is the ASCII value of the key pressed, and S returns 1 if pressed. You can replace this with INKEY or GET.
CALL SOUND(D,N,V) Where D is duration, N is note in Hertz, V is the volume. Most machines have some sound capabilities — so it's easier to write your own.
CALL CHAR(A,NS) Defines characters in Hexadecimal. N is the ASCII character to be redefined. Characters are defined left-to-right from the top. Each digit represents the pattern in a 1×4 horizontal block of pixels; so there are 2 Hex digits for each line of the 8×8 square.
CALL HCHAR(R,C,A,P) Positions ASCII character A, and repeats horizontally from co-ordinates C and R P times.
CALL VCHAR(R,C,A,P) As above except repeats vertically.
CALL COLOUR(S,F,B) Defines character foreground and background colour. Replace with GCOL or INK or other command.
CALL SCREEN(X) Sets screen colour. Replace with PAPER or VDU 19 or COLOUR statement.
CALL CLEAR Clears screen. Use CLS.
CALL GCHAR(R,C,V) Returns ASCII code of character at position R,C in variable V. Use a POINT or screen PEEK.

```
 5 REM  MINE MAZE D.H.SLINN.
 10 CALL CLEAR
 20 PRINT "       ****MINE MAZE****"
 30 PRINT
 40 PRINT "YOU HAVE TO RACE AGAINST"
 50 PRINT "TIME THRO' DIFFERENT LAYERS"
 60 PRINT " OF ROCK TO SAVE THE MINER."
 70 PRINT
 80 PRINT "    THERE ARE 4 DIFFERENT"
 90 PRINT "HARDNESS S OF ROCK RANDOMLY"
 100 PRINT "PLACED. AS EACH SECTION IS"
 110 PRINT "DRILLED IT S HARDNESS AND"
 120 PRINT "THE POSITION OF ROCK OF THE"
 130 PRINT "SAME HARDNESS IS SHOWN FOR A"
 140 PRINT "          SHORT TIME"
 150 PRINT
 160 PRINT "SOME OF THE ROCK IS TOOHARD"
 170 PRINT "          FOR YOUR DRILL "
 180 PRINT
 190 PRINT "     ****USE ARROW KEYS****"
 200 PRINT
 210 PRINT
 220 PRINT "      PRESS ANY KEY TO START "
 230 PRINT
 240 CALL KEY(0,K,S)
 250 IF S=0 THEN 240
 260 CALL CLEAR
 270 FOR I=9 TO 16
 280 CALL COLOR(I,2,2)
 290 NEXT I
 295 REM  DEFINE GRAPHICS
 300 CALL CHAR(128,"3C181818181818")
 310 CALL CHAR(129,"1C18101F1C1C1476")
 320 CALL CHAR(130,"03071F3F7F7FFFFF")
 330 CALL CHAR(131,"FFFFFFFFFFFFFFFF")
 340 CALL CHAR(132,"1818181818181818")
 350 CALL CHAR(133,"FFA5A5A5A5A5A5FF")
 360 CALL CHAR(134,"80C0C0E0F9F8FCFF")
 370 CALL CHAR(135,"0")
 380 CALL CHAR(136,"3F40FF4040585858")
 390 CALL CHAR(137,"FC02FF02FAAAFA02")
 400 CALL CHAR(138,"3F40DF55555F4040")
 410 CALL CHAR(139,"FC02FBAAAAFD0202")
```

TI-99/4A PROGRAM

```
420 CALL CHAR(140,"FF81BDA5BD818181")
430 CALL CHAR(141,"3C42A59999A5423C")
440 CALL CHAR(142,"18242424243C5A5A")
450 CALL CHAR(143,"5A999999999999999")
460 CALL CHAR(144,"FFFFFFFFFFFFFFFF")
470 CALL CHAR(145,"030F1F3F3F7FFFFF")
480 CALL CHAR(146,"0000030F1F1F7FFF")
490 CALL CHAR(147,"000080C0C0E0F8FF")
500 CALL CHAR(148,"80C0C0E0F8FCFFF")
510 CALL CHAR(149,"00000000E0FFFF22")
520 CALL CHAR(150,"18183C5A5A18183C")
530 CALL CHAR(152,"FFC3A49999A542FF")
540 CALL CLEAR
550 CALL SCREEN(6)
560 CALL HCHAR(4,11,141)
570 CALL HCHAR(5,11,142)
580 CALL HCHAR(6,12,136)
590 CALL HCHAR(6,13,137)
600 CALL HCHAR(6,15,138)
610 CALL HCHAR(6,16,139)
620 CALL HCHAR(6,19,145)
630 CALL HCHAR(6,20,144)
640 CALL HCHAR(6,21,144)
650 CALL HCHAR(6,22,148)
660 CALL HCHAR(5,20,146)
670 CALL HCHAR(5,21,147)
680 CALL HCHAR(6,14,140)
690 CALL HCHAR(6,11,143)
700 CALL HCHAR(17,1,131)
710 CALL HCHAR(17,2,134)
720 CALL VCHAR(7,1,120,18)
730 FOR I=3 TO 10
740 CALL HCHAR(17,I,135)
750 NEXT I
760 CALL VCHAR(23,11,131,2)
770 CALL VCHAR(7,11,132,15)
780 CALL HCHAR(22,11,133)
790 CALL HCHAR(17,3,135,8)
800 FOR I=3 TO 9 STEP 2
810 CALL HCHAR(17,I,128)
820 NEXT I
830 CALL HCHAR(6,1,32,10)
840 CALL VCHAR(7,11,132,15)
850 CALL HCHAR(6,17,32,2)
860 CALL HCHAR(6,23,32,10)
870 CALL HCHAR(6,19,145)
880 CALL HCHAR(6,20,131,2)
890 CALL HCHAR(6,22,148)
900 FOR I=13 TO 27 STEP 2
910 CALL HCHAR(22,I,128)
920 NEXT I
930 FOR I=12 TO 26 STEP 2
940 CALL HCHAR(22,I,135)
950 NEXT I
960 CALL HCHAR(22,29,130)
970 CALL HCHAR(22,30,131,3)
980 FOR I=3 TO 9 STEP 2
990 CALL HCHAR(17,I,128)
1000 NEXT I
1005 REM  POSITION DIFFERENT LAYERS OF ROCK
1010 RANDOMIZE
1020 C=12
1030 R=7
1040 A=INT(4*RND)+12
1050 CALL HCHAR(R,C,A*8,3)
1060 C=C+3
1070 IF C>32 THEN 1080 ELSE 1040
1080 C=12
1090 R=R+1
1100 IF R=22 THEN 1090 ELSE 1110
1110 IF R=25 THEN 1120 ELSE 1040
```

```
1120 C=2
1130 R=7
1140 A=INT(4*RND)+12
1150 CALL HCHAR(R,C,A*8,3)
1160 C=C+3
1170 IF C>10 THEN 1180 ELSE 1140
1180 C=2
1190 R=R+1
1200 IF R=17 THEN 1210 ELSE 1220
1210 R=R+1
1220 IF R=25 THEN 1230 ELSE 1140
1230 FOR I=1 TO 3
```

```
1240 C=INT(17*RND)+13
1250 CALL VCHAR(7,C,96,10)
1260 NEXT I
1270 FOR I=1 TO 3
1280 C=INT(9*RND)+2
1290 CALL VCHAR(8,C,96,7)
1300 NEXT I
1310 FOR I=1 TO 4
1320 R=INT(14*RND)+7
1330 C=INT(7*RND)+2
1340 CALL HCHAR(R,C,152,3)
1350 CALL VCHAR(R,C+2,152,2)
1360 NEXT I
1370 FOR I=1 TO 12
1380 R=INT(16*RND)+7
1390 C=INT(19*RND)+12
1400 CALL HCHAR(R,C,152,2)
1410 CALL VCHAR(R,C+1,152,3)
1420 NEXT I
1430 CALL HCHAR(22,28,129)
1440 CALL COLOR(13,2,15)
1450 CALL VCHAR(7,1,120,18)
1460 CALL HCHAR(17,2,134)
1470 CALL COLOR(17,2,134)
1480 CALL COLOR(14,15,6)
1485 REM  EXPLOSION
1490 CALL SOUND(1000,-4,0)
1500 CALL SOUND(100,-7,0)
```

```
1510 CALL HCHAR(22,26,134)
1520 CALL SOUND(100,-6,0)
1530 CALL HCHAR(22,25,144)
1540 CALL SOUND(50,-7,2)
1550 CALL HCHAR(22,18,144,7)
1560 CALL SOUND(600,-6,2)
1570 CALL HCHAR(22,17,130)
1580 CALL SOUND(1000,-7,0)
1590 CALL HCHAR(22,15,134)
1600 CALL HCHAR(22,14,130)
1610 CALL HCHAR(22,11,134)
1620 FOR I=1 TO 3
1630 CALL HCHAR(6,2,150)
1640 FOR D=1 TO 200
1650 NEXT D
1660 CALL HCHAR(6,2,32)
1670 FOR D=1 TO 100
1680 NEXT D
1690 CALL SOUND(50,1000,5)
1700 NEXT I
1710 CALL HCHAR(6,2,150)
1715 REM  SET UP START OF COUNT
1720 TIME=90
1730 R=6
1740 C=2
1750 TIME=TIME-1
```

```
1760 IF LEN(STR$(TIME))=1 THEN 1770 ELSE 1780
1770 CALL HCHAR(4,26,32)
1780 FOR I=1 TO LEN(STR$(TIME))
1790 CALL HCHAR(4,I+24,ASC(SEG$(STR$(TIME),I,1)))
1800 NEXT I
1810 CALL SOUND(100,-4,2)
1820 CALL KEY(0,K,S)
1825 REM  TEST FOR 'OUT OF TIME'
1830 IF TIME=0 THEN 3380
1840 IF K=68 THEN 1900 ELSE 1850
1850 IF K=83 THEN 1920 ELSE 1860
1860 IF K=69 THEN 1940 ELSE 1870
1870 IF K<>88 THEN 1750 ELSE 1880
```

```
1880 DR=+1
1890 GOTO 1950
1900 DC=+1
1910 GOTO 1990
1920 DC=-1
1930 GOTO 1990
1940 DR=-1
1950 RR=R
1960 CC=C
1970 R=R+DR
1980 GOTO 2020
1990 CC=C
2000 RR=R
2010 C=C+DC
2020 IF C>32 THEN 2030 ELSE 2050
2030 C=32
2040 GOTO 1750
2050 IF C<1 THEN 2060 ELSE 2080
2060 C=1
2070 GOTO 1750
2080 IF R<6 THEN 2090 ELSE 2110
2090 R=6
2100 GOTO 1750
2110 IF R>24 THEN 2120 ELSE 2140
2120 R=24
2130 GOTO 1750
2135 REM  TEST FOR HARDNESS OF ROCK
2140 CALL GCHAR(R,C,X)
2150 IF X=96 THEN 2370
2160 IF X=104 THEN 2450
2170 IF X=112 THEN 2560
2180 IF X=120 THEN 2820
2190 IF X=32 THEN 2920
2200 IF X=131 THEN 2950
2210 IF X=128 THEN 2990
2220 IF X=134 THEN 3020
2230 IF X=144 THEN 3020
2240 IF X=130 THEN 3020
2250 IF X=148 THEN 3020
```

```
2260 IF X=145 THEN 3020
2270 IF X=135 THEN 2990
2280 IF X=129 THEN 3060
2290 IF X=143 THEN 3460
2300 IF X=132 THEN 3480
2310 IF X=136 THEN 3550
2320 IF X=137 THEN 3550
2330 IF X=138 THEN 3550
2340 IF X=139 THEN 3550
2350 IF X=152 THEN 2660
2360 GOTO 1750
2370 CALL COLOR(9,11,11)
2380 CALL SOUND(200,30000,30,30000,30,440,30,-4,0)
2390 CALL SOUND(400,30000,30)
2400 CALL COLOR(9,2,2)
2410 GOSUB 3220
2420 CALL HCHAR(RR,CC,135)
2430 CALL HCHAR(R,C,150)
2440 GOTO 1750
2450 REM
2460 FOR D=1 TO 2
2470 CALL COLOR(10,10,10)
2480 CALL SOUND(200,30000,30,440,12,440,30,-4,0)
2490 CALL SOUND(400,30000,30)
2500 CALL COLOR(10,2,2)
2510 GOSUB 3220
2520 NEXT D
2530 CALL HCHAR(RR,CC,135)
2540 CALL HCHAR(R,C,150)
2550 GOTO 1750
2560 FOR D=1 TO 3
2570 CALL COLOR(11,5,5)
2580 CALL SOUND(200,30000,30,880,12,440,30,-4,0)
2590 CALL SOUND(400,30000,30)
2600 CALL COLOR(11,2,2)
2610 GOSUB 3220
2620 NEXT D
2630 CALL HCHAR(RR,CC,135)
2640 CALL HCHAR(R,C,150)
2650 GOTO 1750
2660 FOR D=1 TO 3
2670 CALL COLOR(16,16,2)
2680 CALL SOUND(200,30000,30,1000,12,440,30,-4,0)
2690 CALL COLOR(16,2,2)
2700 NEXT D
2710 IF K=68 THEN 2760
```

```
2720 IF K=83 THEN 2780
2730 IF K=69 THEN 2800
2740 R=R-1
2750 GOTO 1750
2760 C=C-1
2770 GOTO 1750
2780 C=C+1
2790 GOTO 1750
2800 R=R+1
2810 GOTO 1750
2820 FOR D=1 TO 4
2830 CALL COLOR(12,4,4)
2840 CALL SOUND(150,30000,30,880,12,440,30,-4,0)
2850 CALL SOUND(400,30000,30)
2860 CALL COLOR(12,2,2)
2870 GOSUB 3220
2880 NEXT D
2890 CALL HCHAR(RR,CC,135)
2900 CALL HCHAR(R,C,150)
2910 GOTO 1750
2920 CALL HCHAR(RR,CC,32)
2930 CALL HCHAR(R,C,150)
2940 GOTO 1750
2950 CALL SOUND(100,200,4,210,4,-4,3)
2960 CALL HCHAR(RR,CC,135)
2970 CALL HCHAR(R,C,150)
2980 GOTO 1750
2990 CALL HCHAR(RR,CC,135)
3000 CALL HCHAR(R,C,150)
3010 GOTO 1750
3020 CALL SOUND(100,110,9,140,9,440,30,-4,0)
3030 CALL HCHAR(RR,CC,135)
3040 CALL HCHAR(R,C,150)
3050 GOTO 1750
3060 FOR I=1 TO 4
3070 CALL SOUND(100,1000,2)
3080 FOR D=1 TO 50
3090 NEXT D
3100 NEXT I
3105 REM  WINNING ROUTINE
3110 M$="YOU DID IT!"
3120 R=18
3130 C=19
3140 GOSUB 3310
3150 M$="PRESS ANY KEY"
3160 R=20
3170 C=18
3180 GOSUB 3310
3190 CALL KEY(0,K,S)
3200 IF S=0 THEN 3190
3210 GOTO 780
3215 REM  TIME COUNTDOWN ROUTINE
3220 TIME=TIME-1
3230 IF LEN(STR$(TIME))=1 THEN 3240 ELSE 3250
3240 CALL HCHAR(4,26,32)
3250 FOR I=1 TO LEN(STR$(TIME))
3260 CALL HCHAR(4,I+24,ASC(SEG$(STR$(TIME),I,1)))
3270 NEXT I
3280 CALL SOUND(100,-4,2)
3290 IF TIME=0 THEN 3380
3300 RETURN
3305 REM  PRINT MESSAGE ROUTINE
3310 FOR I=1 TO LEN(M$)
```

```
3320 CD=ASC(SEG$(M$,I,1))
3330 CALL HCHAR(R,C,CD)
3340 C=C+1
3350 NEXT I
3360 RETURN
3370 STOP
3375 REM  LOSE ROUTINE
3380 CALL SOUND(100,200,4)
3390 CALL SOUND(250,110,1)
3400 M$="***FAILED***"
3410 R=18
3420 C=17
3430 GOSUB 3310
3440 GOTO 3150
3450 END
3460 C=10
3470 GOTO 1750
3480 FOR D=1 TO 4
3490 CALL SOUND(200,400,4,200,4,-4,2)
3500 GOSUB 3220
3510 NEXT D
3520 CALL HCHAR(RR,CC,135)
3530 CALL HCHAR(R,C,150)
3540 GOTO 1750
3550 R=7
3560 GOTO 1750
```

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Something for everyone in the micros of '83

The all-purpose micro?

Memotech's MTX500, from a company best known for ZX81 add-ons, is one of the heavyweights of the new bunch — in price as well as size and weight.

Due on sale in two months at about £275, it is being promoted as the all-purpose computer.

Starting from the outside, it is clad in black aluminium with a 79-key QWERTY typewriter-style keyboard with, to the right, 12 keys for numbers, cursor control and editing plus a further eight user-definable function keys.

Inside is 32K of RAM — expandable to 512K — plus 16K of video RAM. It can display 16 colours, text on a 40-column screen, and graphics at 256 by 192 with moving user-definable graphics, or sprites.

Standard outputs are Centronics-type printer port, two ports for joysticks, an uncommitted input-output port, 2400 baud cassette port, separate ports for TV and monitor, three-voice sound with hi-fi output and a dedicated port for cartridges.

Optional expansions — with more promised — include 80-column colour video board, twin RS-232 interfaces and 5¼in and 8in floppy disc interfaces to run CP/M, the operating system for much business software.

In the 16K ROM are Memotech's BASIC, the LOGO language used in education for sprites and NODDY, a language which makes question-and-answer programming simpler, according to Memotech.

There is also an assembler/disassembler with a special screen display — controlled by the keyboard — of the storage locations of the computer's Z80 processor, the memory and the program.

Machine code can be stepped through one instruction at a time and called from BASIC.

Pascal comes as an add-on ROM pack.

Memotech is promising at least 12 arcade-style games at launch, four business programs, including a spreadsheet and word processor, the first two of a series of educational programs and four board games — chess, backgammon, Othello and draughts.

Financial manager Robin Tupper said the MTX500 production would be split, with a third each going to America and Europe.

Memotech, Station Lane Industrial Estate, Witney, Oxon OX8 6BX

Gloria Douse, 20, with the Laser 200

Atari's large-scale launch

Atari is soon launching no less than four computers here, together with about 11 peripherals and accessories.

No prices have yet been decided. All the new micros will be compatible with existing software, they will have full typewriter-style keyboards and four extra graphics modes to add to the present 12 which can be called from BASIC.

These are the details so far:

- The 600XL has 16K of RAM — expandable to 64K — built-in BASIC in the 16K ROM, four voices, 16 colours in a choice of 16 shades, help key, self-test feature and cassette port.
- The 800XL is similar, but with 64K of RAM as standard.
- The 1400XL has all the features of the first two, plus four function keys, a modem interface — replacing the modem in the U.S. model — and a built-in voice synthesiser controlled by English-like commands.
- The 1450 XLD is the top of the new range — the D stands for disc. It has a built-in double-sided dual density drive for a 5¼in floppy disc. Alongside is a storage compartment which can be easily replaced with a second drive.

The first two are due for possible release in the late autumn.

Among the new peripherals and accessories:

A four-colour printer-plotter — using small ballpoint pens on 4½in plain paper — similar to the models marketed by Tandy, Oric and others.

A restyled and updated program recorder.

An 80-column dot matrix printer, needing no interface for Atari computers, running at a claimed 40 characters per second.

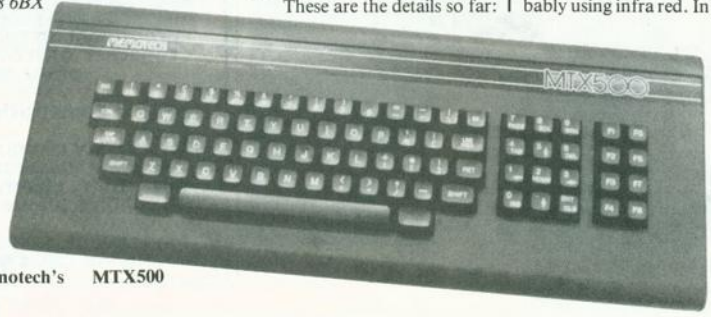
A letter-quality printer.

A CP/M 2.2 module — the operating system used for much business software — which also adds 64K of RAM and 80-column monitor output.

A 5¼in floppy disc drive.

A touch tablet with built in pen for easier drawing on screen.

A remote control joystick, probably using infra red. In America



Memotech's MTX500

radio is used, but regulations forbid this in the UK.

A "trak-ball" controller with two fire buttons — similar to arcade machines.

A pistol-type joystick with fire button.

An external processor bus for memory expansion and future peripherals.

Atari (UK), Atari House, Railway Terrace, Slough, Berks SL2 5BZ

Adler's identity crisis

In the upper price bracket is the £400 Alphatronic PC from Triumph Adler, the giant West German company well-known for its typewriters.

It is the company's first venture into personal computers, although it has been supplying business micros for some years.

The Alphatronic PC, using a Z80 microprocessor, has 64K of RAM, 32K of ROM — including a 24K BASIC — a typewriter-style keyboard with six function keys and a slot for cartridges, including an extra 16K of RAM.

It can display eight foreground and eight background colours on screen.

Outputs include RS-232 and Centronics-type for printers, black and white TV, RGB and monitor and floppy discs — a drive for dics is available.

It uses the CP/M operating system, so the existing range of about 300-plus programs, mainly for business, would be available, said marketing manager John Kendall.

He said: "We are confused because everyone seems to want it. People who have got Sinclair machines want to get to something which is more powerful and a lot of companies want it too. There is a big demand for a standard 64K CP/M computer.

"I would imagine that the Commodore 64 will come under a major threat."

The Alphatronic, due to go on sale in October, would have a target of 40 programs — half educational and half games — available from day one.

Triumph Adler, 27 Goswell Road, London EC1M 7AJ

Made in Hong Kong

Two low-cost computers will soon be reaching the dealers from Hong Kong — the Laser 200 and the COMX 35.

The Laser is aimed at the newcomer to computing and, at £69.95, is claimed to be the world's lowest priced colour computer.

It has 45 rubber-like keys, 4K of RAM — expandable to 68K — and Microsoft BASIC in the 16K ROM. In text mode it has 32 columns by 16 rows with maximum graphics resolution of 128 by 64. Eight colours are available and there is a single channel sound generator.

And, like the Spectrum, it has single keyword entry.

Computers for All, the UK distributors, says a range of software will be available starting in July, along with a printer-plotter at £149.95 using 4½in rolls of plain paper and ballpoint pens, similar to the model marketed by other companies.

Also due: a 16K RAM pack at £29.95; joysticks, £19.95 a pair; Centronics printer interface, £19.95; light pen, £19.95; 64K RAM pack, £59.95.

FORTH and another BASIC are promised for August at £5.95 on cassette.

The COMX 35 includes a built-in joystick to the left of the keyboard in its price of £119.95. The 55 keys are similar to those on the Tandy Colour Computer.

Unlike the Laser, which uses the popular Z80A processor, the COMX has the less well-known 1802.

Although it offers 35K of RAM — hence the name — 3K is used to handle the screen, leaving 32K of user RAM, and 16K of ROM.

The COMX comes with 10 programs on a free cassette tape and the manufacturers are working on a plug-in printer interface.

● The Laser 200 has a sister, the Zeta, which has 8K of RAM and an estimated price of £89. It is being distributed by a different company, although it is made by the same Hong Kong firm, Video Technology. Both are developments of an earlier computer called the VZ200.

Computers for All, 72 North Street, Romford, Essex

The COMX 35 shown off by Joanna Cox, 27

You could be on our pages

We welcome programs articles and tips from our readers.

PROGRAMS should, if possible, be computer printed to a width of 48 characters (use a new ribbon) and/or sent on cassette. Check carefully that they are bug-free. Include details of what your program does, how it works, variables you have used and hints on conversion.

ARTICLES on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCW. Articles most likely to be published will help our readers make better use of their micros by giving useful ideas, possibly with programming examples. We will convert any sketched illustrations into finished artwork.

TIPS are short articles, and brief programming routines which we can put together with others. Your hints can aid other computer users.

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Paul Liptrot, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE

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How's your aim? It could save your life

A version of the classic arcade game, Bomber, written for the Dragon by Ian Sellman

This game gives the word bomber the meaning it had during World War Two. You must use your bomb aiming skills to destroy the city below before your aircraft loses power and crashes into the high-rise buildings.

The program is devised to increase the difficulty as each raid is successfully completed.

The score moves from one game to the next until the inevitable crash occurs as the aircraft runs out of fuel before it has cleared enough space to land.

The only operation required is the bomb aim and release mechanism, controlled by the space bar.

You could play it with friends as Bomber is ideal for competitive play.

Dragon Basic — a version of Microsoft — is extremely powerful and the 6809E processor, which is in the class of the BBC for speed, makes this program very hard to convert.

I suggest you completely rewrite the program for your own micro.

Hints on conversion

This program should run as it stands on the Tandy Colour Computer, but when converting for other micros, the following points must be taken into account:

- The Dragon has the ability to have two graphics screens and a text screen, all set up at the same time
- The text screen has a resolution of 32 by 16 and the high resolution is 256 by 192
- The GET and PUT commands form a powerful alternative to user defined graphics
- P SET is the same as PLOT, and PRESET is the same as UNPLOT
- On most micros you can print on the high-resolution screen — this means you can forget about most of the score routines.

How it runs

10 speeds up the Dragon. If you press Break, peculiar things will happen to your next program.
20-140 title page
150-200 instructions
210-290 dimension arrays and set variables
300-430 draw plane and bomb and GET them into an array
440-650 draw city
660-780 plane's movement loop
790-870 bomb movement sub-routine
880-1050 crash routine
1060-1130 end routine
1140-1270 land routine
1280-1360 score sub-routine
1370-1450 city score sub-routine
1460-1550 routine for drawing numbers

Main variables

P(20,10), PI(20,10) arrays containing plane, space which erases plane
B(10,10), BI(10,10) array containing bomb, space which erases bomb
Y,X height, horizontal position of plane
Z amount by which plane loses height on each pass
S, S$ score
C, C$ city being bombed
T building being drawn
B height of building
F set to 1 if bomb is on screen
B (lines 600 on) number of selections of building to be destroyed, each section having one row of windows

```
10 POKE&HFFD7,0
20 CLS
30 PRINT@33,"*****************************
***"
40 PRINT@65,"*****************************
***"
50 PRINT@449,"*****************************
****"
60 PRINT@417,"*****************************
****"
70 FORX=33 TO449STEP32
80 PRINT@X,"**";
90 PRINT@X+28,"**";
100 NEXTX
110 PRINT@172,"bomber";
120 PRINT@230,"              I.C SELLMAN";
130 PRINT@299,"MARCH '83";
140 PLAY"CDEFGABBAGFEDC"
```

```
150 CLS
160 PRINT@12,"BOMBER";
170 PRINT@44,"******";
180 PRINT@128," THE AIM OF BOMBER IS FOR
 YOU  BY PRESSING THE SPACEBAR TO DROPB
OMBS FROM YOUR PLANE TO DESTROYTHE CITY
SO YOU CAN LAND. WHEN  YOU HAVE LANDED Y
OU ARE GIVEN  ANOTHER CITY TO DESTROY.
THE  GAME ENDS WHEN YOU CRASH INTO A B
UILDING.
190 PRINT@448,"PRESS A KEY TO PLAY";
200 IF INKEY$="" THEN 200
210 PCLEAR8
220 DIMP(20,10)
230 DIM PI(20,10)
240 DIM B(10,10)
250 DIM BI(10,10)
260 Y=20
270 Z=5
280 S=0
290 C=1
300 PMODE4,1:PCLS
310 DRAW"BM10,10D4RU5DRD4RU3RJ1U3RL6RD4R
7U2D5U3L14DR5D2LR6LU2R2L10"
320 CIRCLE(100,100),5
330 PAINT(100,100)
340 GET(8,8)-(28,18),P,G
350 GET(95,95)-(105,105),B,G
360 GET(10,100)-(30,110),PI,G
370 GET(10,100)-(20,110),BI,G
380 PMODE4,5:SCREEN1,1
390 PMODE4,5:PCLS
400 FORX=10TO20
410 DRAW"BM"+STR$(X)+",150S32BM+0,-6D6E2
F2U6BM+4,+6U5ER2FD5U3L4BM+9,+3R2LU6LR2BM
+6,+6U6L2R4BM+4,+6S4"
420 SCREEN1,1
430 NEXTX
```

```
440 REM**draw*buildings*****
450 PMODE4,1:PCLS
460 LINE(5,190)-(243,190),PSET
470 FOR T=0TO19
480 FOR B=0TORND(7)+2
490 PMODE4,5
500 PUT(X),50)-(X1+20,60),PI,PSET
510 X1=X1+10
520 IF X1>230 THEN X1=1
530 PUT(X1,50)-(X1+20,60),P,PSET
540 PMODE4,1
550 LINE(5+T*12,190-B*5)-(15+T*12,185-B*
5),PSET,BF
560 FOR J=2TO8STEP2
570 PRESET(5+T*12+J,187-B*5)
580 NEXTJ,B,T
590 REM**status*line*********
600 LINE(0,10)-(256,10),PSET
610 DRAW"BM11,8HU4ER2FHL2GD4FR2EBM+5,+1R
2LU6LR2BM+6,+6U6L2R4BM+6,+6U4H2F2E2BM+4,
+1DBM+0,+2D":REM*"cities:"*
620 DRAW"BM100,7FR2EH4ER2FBM+5,+5HU4ER2F
HL2GD4FR2EBM+5,+1R2EU4HL2GD4FBM+7,+0U6R3
FDGL3RF3BM+4,+0R4L4U3R4L4U3R4BM+4,+1DBM+
0,+2D":REM*"score"*
630 GOSUB 1280
640 GOSUB1370
650 SCREEN1,1
660 REM**movement*loop******
670 FOR X=0TO235 STEP10
680 PUT(X,Y)-(X+20,Y+10),P,PSET
690 IF INKEY$=CHR$(32) THEN IF F=1 THEN
700 ELSE F=1:Y1=Y+10:X1=X+5:B=RND(3)+2:S
OUND200,1
700 IF F=1 THEN GOSUB 790 ELSE FOR D=1TO
100:NEXTD
710 IF Y>175 AND X>200 THEN GOTO1140
720 FORA=0TO20
730 IF PPOINT(X+A,Y+11)<>0 THEN 880
740 NEXTA
750 PUT(X,Y)-(X+20,Y+10),PI,PSET
760 NEXTX
770 Y=Y+2
780 GOTO670
790 REM**bomb***********
800 PUT(X1,Y1)-(X1+10,Y1+10),B,PSET
810 FORA=0TO10
820 IF PPOINT(X1+A,Y1+11)<>0 AND Y1<181T
HEN S=S+10:B=B-1:GOSUB1280:GOTO840
830 NEXTA
840 PUT(X1,Y1)-(X1+10,Y1+10),BI,PSET
850 IF B<1 OR Y1>180 THEN F=0
860 Y1=Y1+10
870 RETURN
880 REM**crash***********
890 PMODE3,1:SCREEN1,RND(2)-1
900 COLORRND(4)
910 FORQ=1TO50
920 COLORRND(4)
930 LINE(X+20,Y+5)-(RND(256),RND(182)+10
),PSET
940 SOUNDRND(55)+200,1
950 NEXTQ
960 FOR X=0TO10
970 DRAW"BM"+STR$(X)+",100S28C8BM+1,+0HU
4ER2FHL2GD4FREBM+4,+1U6R3FDGL3RF3BM+4,+0
U5ER2FD5U3L4BM+8,+2FR2EH4ER2FBM+4,+5U6D3
R4U3D6BM+4,+0"
980 NEXTX
990 FORT=1TO25
1000 FORV=0TO1
1010 SCREEN1,V
1020 FORD=1TO100:NEXTD
1030 NEXTV,T
1040 A$=INKEY$
1050 CLS
1060 SCREEN0
1070 PRINT@12,"BOMBER"
1080 PRINT@44,"******"
1090 PRINT@128," YOU HAVE CRASHED. BEFOR
E YOU  CRASHED YOU SCORED";S;"POINTS ",
"AND DESTROYED";C;" CITIES";
1100 PRINT@448,"DO YOU WISH ANOTHER GO (
Y/N)?";
1110 A$=INKEY$:IF A$="" THEN 1110
1120 IF A$="Y" THEN RUN
1130 POKE&HFFD6,0:CLS:END
1140 REM**landed***********
1150 FOR X=3TO13
1160 DRAW"BM"+STR$(X)+",100S20R4L4U6BM+8
,+6U5ER2FD5U3L3BM+8,+3U6DF4DU6BM+4,+6U6R
3FD4GL3BM+8,+0R4L4U3R4L4U3R4BM+4,+6U6R3F
D4GL3S4"
1170 NEXTX
1180 PCOPY 1TO5
1190 PCOPY 2TO6
1200 PCOPY 3TO7
1210 PCOPY 4TO8
1220 S=S+100
1230 C=C+1
1240 Y=20
1250 Z=Z+3
1260 PMODE4,5:SCREEN1,1
1270 GOTO440
1280 REM**score***********
1290 LINE(145,0)-(240,9),PRESET,BF
1300 S$=STR$(S)
1310 DRAW"BM150,8"
1320 FOR A=2TOLEN(S$)
1330 A$=MID$(S$,A,1)
1340 ON VAL(A$)+1  GOSUB 1460,1470,1480,
1490,1500,1510,1520,1530,1540,1550
```

DRAGON PROGRAM

```
1350 NEXTA
1360 RETURN
1370 REM**city*****************
1380 LINE(45,0)-(90,9),PRESET,BF
1390 C$=STR$(C)
1400 DRAW"BM50,8"
1410 FOR A=2TOLEN(C$)
1420 A$=MID$(C$,A,1)
1430 ON VAL(A$)+1 GOSUB 1460,1470,1480,1
490,1500,1510,1520,1530,1540,1550
1440 NEXT A
1450 RETURN
1460 DRAW"BM+0,-1FR2EU4HL2GD4BM+8,+1":RE
TURN
1470 DRAW"BM+1,+0U6GBM+6,+5":RETURN
1480 DRAW"BM+4,+0L4UER2EU2HL2GBM+8,+5":R
ETURN
1490 DRAW"BM+0,-1FR2EUHL2R2EUHL2GBM+8,+5
":RETURN
1500 DRAW"BM+3,+0U6G3R4BM+4,+3":RETURN
1510 DRAW"BM+0,-1FR2EU2HL3U2R4BM+4,+6":R
ETURN
1520 DRAW"BM+0,-2ER2FDGL2HU4ER2FBM+4,+5"
:RETURN
1530 DRAW"BM+2,+0U2E2U2L4BM+8,+6":RETURN
1540 DRAW"BM+1,+0R2EUHL2HUER2FDGL2GDFBM+
7,+0":RETURN
1550 DRAW"BM+0,-1FR2EU4HL2GDFR3BM+4,+3":
RETURN
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games to put across the Spectrum

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Starfire 48K £7.95

Virgin Games, 61/63 Portobello Road, London W11

This is a very good implementation of the standard Startrek game.

Some of the features you might expect are missing — for example no warp factors or impulse engines. Some features that left something to be desired in the original are kept on, such as the coded long-range scan. Surely the Spectrum's graphics could give a more interesting display?

But the game's good points outweigh any quibbles. The graphics interludes for docking, asteroids storms and time portals (all quite reasonable games in themselves), the combat mode and, in particular, the programmer's slightly sadistic sense of humour made this a very enjoyable game.

N.W.

instructions	90%
playability	90%
graphics	90%
value for money	95%

★ ★ ★ ★ ★

Spawn of Evil £4.95

dk'tronics, Unit 2, Shire Hill Industrial Estate, Saffron Walden, Essex

One whole side of the tape is devoted to detailed instructions on how to play and setting out the complex breeding cycle of your enemy. Your mission is to boldly go where no Spectrum owner has been before to destroy "EGG" and its progeny.

The lengthy instructions may be copied to your printer and on the ZX printer exceed 1 metre long. Careful study of the tutor section is advisable before you go EGG hunting.

Your screen shows either a wide range scanner view or a more detailed close up of the battle. There are several realistic features: having to stop for repairs, guns overheating and a good simulation of a space dogfight.

The game has obviously been well thought out and is colourful and exciting to play. But the version I had tended to crash on occasions for no apparent reason.

D.J.

instructions	90%
playability	80%
graphics	80%
value for money	80%

★ ★ ★

Sheepwalk 48K £7.95

Virgin Games, 61/63 Portobello Road, London W11

A simple idea but a novel, fun and difficult game. You control a sheepdog called Rex (who looks like a black trestle table), whose task it is to herd a number of errant sheep back into their pen. Sheep may be lost in a river, or may wander into crops and eat them. Points are lost for both of these. Rex will also damage crops if he passes through them.

I found the control keys too close together for comfort but the more nimble-fingered may have no problem. There's an option for joystick control, but as the game is mainly in Basic it does not have the speed which makes joysticks a must.

Handling Rex is a matter of very precise judgement, quite hard to achieve. But with practice the game might pall — there are no higher skill levels as you get better.

N.W.

instructions	80%
playability	85%
graphics	85%
value for money	80%

★ ★ ★ ★

Golf £7.95

Virgin Games, 61/63 Portobello Road, London W11

There are golf games and golf games and this is one of the best I've seen. You can select the number of holes (up to eighteen), up to four players and the handicap for each player.

Each hold demands choosing one of five clubs, a correct estimate of the direction of the shot, and strength of the swing on a scale of 0 to 10.

Better use could have been made of the graphics and the layout of current score and position could be more attractive. A nice touch, however, is the graphic of the player swinging at his ball, and the line drawn across the course to show the route you have taken so far.

As an indication of the complexity of the game (or perhaps my golfing ineptitude), on my strokes!

B.B.

instructions	95%
playability	90%
graphics	80%
value for money	90%

★ ★ ★ ★

Yomp £7.95

Virgin Games, 61/63 Portobello Road, London W11

The first stage of Yomp is really a Frogger variant. Your five paratroopers have to cross four lanes of fast-moving traffic, and when three men are across the second stage begins.

Unlike Frogger, there is only traffic to contend with, but the gaps are small, and the four lanes travel at different speeds.

The second stage involves using a radar scanner to cross an enemy minefield, in the manner of Mined-Out. Movement sensors mean sudden death if you make too many mistakes.

Your task is not helped by having a flashing paratrooper — most distracting! The graphics are good, but confusing — you can sometimes escape when you appear to have collided and vice versa.

Not too bad, but overpriced. You do get two games, but neither is as good as similar games taken separately.

N.W.

instructions	90%
playability	75%
graphics	85%
value for money	70%

★ ★ ★

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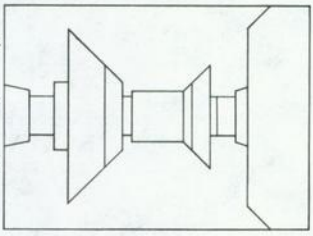

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All systems go . . . for a look at some action games

Discover who came out best when or reviewers tried to out-zap these versions of arcade favourites

Frogrun Commodore 64 £6

Anirog, 26 Balcombe gardens, Horley, Surrey

Anirog's version of the now famous frog splatting game makes splendid use of the Commodore's graphics features. The screen display is really state of the art. You can even see the alligator's teeth!

Due to the length of the program, it takes a long time to load so it's best to make a cup of coffee while you're waiting. Once the program is running you'll get so hooked that you'll never get round to the coffee.

The instructions are basic and don't tell you that you need to press the space bar to start each game. They say that you get 10 points for moving forward, but I never did. My score remained obstinately at zero during my first 15 or so games until I eventually got a frog home, then I suddenly got the accredited 200 points.

L.C.

instructions	20%
playability	80%
graphics	90%
value for money	70%

★ ★ ★ ★

Super Glooper/ Frogs 16K ZX81 £4.95

Psion, 2 Huntsworth Mews, Gloucester Place, London NW1

Super Glooper moves around a maze, 'painting' it as he goes, and avoiding the aliens — unless he has picked up a shield which allows him to destroy them. When one maze has been completely painted a more difficult one appears.

The controls for each direction are provided by any key in several 'blocks' which means that you may position your fingers in any manner you find comfortable.

Frogs is of course Frogger. In this version the poor amphibian has to cross not a road but a river, by jumping from boat to boat — if he falls in, he's had it (although why this would be fatal to a frog I don't see) — and then on to one of the jetties on the far side.

Each jetty can only be used once per game, so take care; as the final column of boats moves from left to right, the jetty on the extreme left is very difficult to reach.

The boats move in alternate columns which travel left and right; once your frog has left the safety of the riverbank great concentration is required to land him safely on the other side.

I enjoyed 'Frogs' much more than 'Super Glooper', but they are both very adequately-produced games, and fun to play if you are not already over-familiar with them. Having two games on one cassette makes for better value, too.

C.C-R

instructions	75%
playability	70%
graphics	70%
value for money	60%

★ ★ ★

Mushroom Mania 48K Oric £4.50

Arcadia, 4 Sunningdale Avenue, Swansea SA3 5HP

Arcadia's version of Centipede, with a fierce spider and Pac Man style character thrown in, is absorbing entertainment forone or two players.

Use of the Oric's sound and colour capabilities was excellent, and a record of high scores (60,879 was the best achieved) can be kept.

Points are scored for shooting down the spider and the muchrooms, which are constantly being replaced to try and hinder manoeuverability of your fire power. There are nine skill levels, from fairly easy to almost impossible.

Basically simple, Mushroom Mania is addictive enough to prevent eventual boredom, and is good value for money too.

S.I.

instructions	50%
playability	90%
graphics	90%
value for money	90%

★ ★ ★ ★

Millipede/ Road Runner 16K ZX81 £4.95

Axis, 71 Brookfield Avenue, Loughborough, Leics LE11 3LN

Two arcade games of the shooting variety — but with quite different targets.

Of the two, I liked Road Runner best. It comes in two parts. In the first, you have to shoot down moving fairground-type targets which move from side to side across the screen. If you succeed at this, you have to aim at Road Runner himself. If you hit him he is only stunned, and will pick himself up and move in the other direction. But beware — his speed will increase.

Millipede is of course a version of Centipede, in which you have to blast away all the segments of a long worm-like beastie zig-zagging its way towards the bottom of the screen. Slower than Road Runner, and needing less skill in timing.

The graphics are not ornate in these games, but movement is fast and smooth, and the controls respond well.

C.C-R

instructions	80%
playability	75%
graphics	60%
value for money	70%

★ ★ ★

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READ-OUT

Are cartridges really worth the cash?

Tom Donald takes a look at some of the offerings you might pick up at your local VIC dealer

Sargon 2 Chess Commodore £25

Of course this program is capable of playing chess and playing it to a very high standard, but what **else** can it do?

Well, to start off with, you can select the display colours, an important consideration if you are going to be playing for a long period. You can play a full game, or set up a particular problem for the computer to work through, or reset a half finished game.

You can make moves with a joystick or the keyboard, and the program will give a hint as to a good move, if requested.

There are seven levels of play, with response times from immediate up to several hours. The graphics are good, easily recognisable, and little bleeps keep sleepy players from missing Sargon's moves.

The instruction booklet is comprehensive and well written, and includes a basic introduction to chess for complete beginners.

If you think that chess is a lot of fun, buy this cartridge because it's certainly got a lot of chess.

instructions	90%
playability	90%
graphics	80%
value for money	75%

★ ★ ★ ★

Gorf Commodore £25

The cartridges that squeeze into the back of the VIC are actually quite small. It is strange however that some are packed full of crazy mutants and hideous aliens, while some have barely enough horrible denizens of outer space to invade a reasonably sized chocolate biscuit. Gorf is in the former category.

In four stages they come, first as space invaders, then armed with lasers, then swooping and spiraling out of what we are told is a black hole (who can doubt it?) and finally shuttling around in a large rocket while bombarding us hapless earthlets with chunks of asteroid.

This is a very good game, well thought out and carefully presented. As you struggle through the stages, you are promoted from cadet upwards, and as the Russians discovered at Stalingrad, promotion and the honours of elevated rank motivate fighters to battle with will.

Herein lies a problem...A person of my acquaintance **fractured his joystick** while playing this game. What a fate! Let this be a warning to you all. Waggle it around but don't grip it too tightly or you might break it off...

instructions	90%
playability	90%
graphics	95%
value for money	80%

★ ★ ★ ★ ★

River Rescue Thorn-EMI £25

In general the cartridges produced so far by Thorn for the VIC have shown a high standard of attention to detail: none more than this, in which a simple idea, that of controlling a boat up a randomly generated river, has been developed into an interesting and enjoyable game for one or two players.

The speed and position of the boat are controlled from joystick or keyboard. Obstacles appear in the river and have to be shot out of the way, there are explorers to be picked up up from passing jetties.

The range of speeds available means that this program is fun for beginners and skilled joystick manipulators alike.

While programs in cartridge remain as expensive as at present, the daft situation arises that you can buy a computer for the price of two of these programs, or one hundred and forty two issues of this magazine.

But for those who can afford it this game will be a lasting source of enjoyment.

instructions	
playability	95%
graphics	90%
value for money	90%
	50%

★ ★ ★

Mutant Herd Thorn-EMI £25

This is a two stage game, and an odd one. Using crossed laser beams, the player shunts great packs of mutant beasties around the screen. There are little mutie-killers on the loose as well, and our task is to herd them down burrows where their talent for mayhem may be most effectively expressed.

No bunnies inhabit these burrows, rather hideous mutant-mothers laying the eggs of a new generation of creeping things. The second part of the game involves the destruction of these eggs and finally the extinction of the egg layer herself.

The game is original and very well presented. If you are yourself a mutant monster with an unresolved Oedipal complex then playing this game could precipitate a psychiatric crisis; otherwise you will probably have a reasonable amount of fun....

instructions	90%
playability	70%
graphics	90%
value for money	65%

★ ★ ★

Omega Race Commodore £25

I have played this game more often and with more pleasure than any other game for my Vic.

If I tell you that Omega Race is a cross between Asteroids and snooker, then perhaps it will be clear that this is not an ordinary space invaders clone. Around an enclosed track our little spaceship shuttles, bouncing elastically from the sides, its task, to shoot various enemy blobs that pursue it, first shuffling, than at the trot, then bouncing and spinning at full tilt.

Playing colours are selectable (and the sound effects are only a teeny weeny bit tiresome). To describe the graphics would be to risk accusation of understatement.

What more can I say?

instructions	75%
playability	95%
graphics	105%
value for money	90%

★ ★ ★ ★ ★

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It's all new. What we found at the Computer Fair

In another show report, Paul Liptrot tells you what you may have missed at the Earls Court Computer Fair

Shirley Fenton and Richard Cheetham, two 21-year-olds who set up C-Tech after university, launched Rocket Raider, a Spectrum space game selling at £5.95. It was written over four months by student Nigel Alderton, 17, and Miss Fenton said: "It should overtake Arcadia and Penetrator — the graphics are far better than Arcadia."

In about a fortnight C-Tech is bringing out another new game, Knocker Blocker, priced at £4.95 and also for the Spectrum, in which a character has to knock is nails before monsters catch up with him. The author is another student, David Bryant, 19, who is studying computer science.

Kansas had two new £9.50 adventures for the BBC micro. They are The Ring of Time and Revenge of Zur — with help given on the phone for players who are stumped.

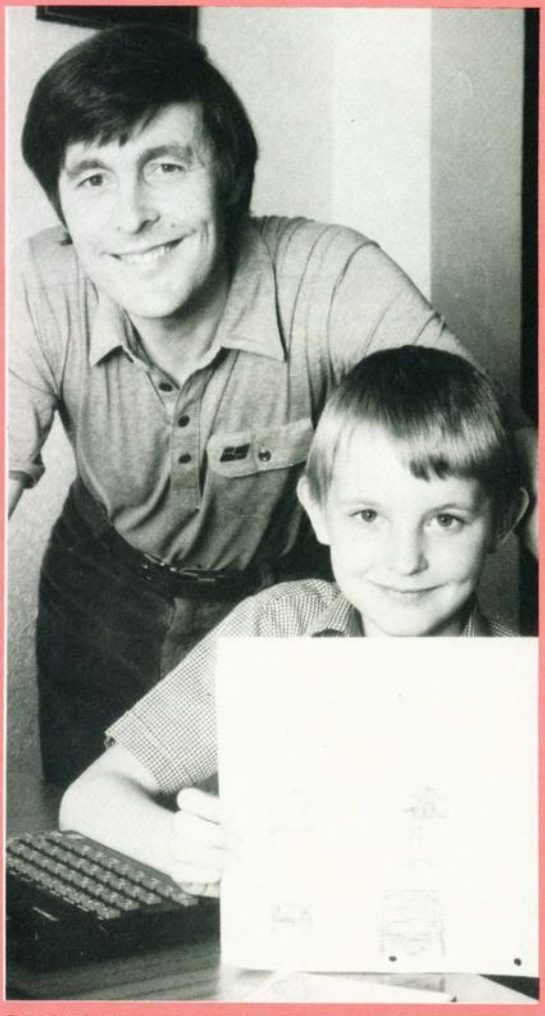
NewBrain owners who write their own software can now get a deburger at £24.50 and a printer screen dump program, costing £14.50, from Kuma.

Primary school headmaster Gordon Askew, 33, has written six educational game programs for the 16K ZX81, for children of five-seven and seven-11. JRS is marketing them as Edutapes 1, 2 and 3 at £4.95 with two programs on each tape. Each of the cassettes — two for the older age group — use the JRS technique to load in less than a minute.

JRS also brought out three cassettes, each with two games, at £4.95 also for the 16K ZX81 and three at £6.50 each for the Jupiter Ace with 16K expansion.

Sunshine showed the new Dragon version of its Cruising on Broadway game.

Imagine gave a first public showing to Jumping Jack, a £5.50 game for the Spectrum from Albert Ball, a 36-year-old electrical engineer. Jack tries to climb a multi-storey building, facing hazards like an octopus, train and an axe. Mr Ball's son Stuart, 10, drew the hazards — and gets a mention on every cassette.



Jumping Jack author Albert Ball with son and helper Stuart, 10 — their game is now out from Imagine

Romik is planning to release two games each for the Lynx, ZX81, Dragon and Spectrum in about a month. And later on there will be tapes for the Commodore 64 and VIC-20.

Space Shuttle, written by a genuine NASA employee, is among a batch of Dragon programs due out from Microdeal on Friday. They are all U.S. imports except one, the company's first from a British author. Steve Bak has written a maze game called Cuthbert Goes Walkabout.

The others are Frogger, Golf and Morocco Grand Prix, all at £8, a four-voice sound synthesiser called The Composer, £15, and Tele Tutor, £25, an educational database to store maths questions. More are due at September's PCW show.

As promised at the Commodore show, Rabbit brought out Spectrum conversions of six of its Commodore 64 and VIC-20 games — Escape MCP, Quackers, Phantasia, Centropods, Race Fun and Frogger. Sales boss John Willan said the firm was aiming for a range of 20 for each of the three computers.

Join a World War One aerial battle with Dogfight, at £8.65 for the BBC micro. It is the first of a dozen games from add-on suppliers Opus, said partner Rowland Hoar. Dogfight was written by Andrew Hillbig — or "Slogger", as he calls himself on the cassette.

Five games for the Spectrum, VIC-20 and BBC micros are due from Quicksilva in about a fortnight. And in September there will be at least 10 more, said sales boss Rod Cousens. Mysteriously, he added: "There are some brand new ideas which we can't discuss at present."

Kobra sales director Peter Raybaud said his company was deciding on which Commodore 64 games cartridges to import from Sweden. A database for the 64 on disc, and possibly cartridge, was being brought in from Canada.

Dragon specialists Premier showed its disc system plus four new utilities: HiPrint, at £7.95 or £9.95 for the disc version, which dumps a hi-res screen to the printer; Encoder 09, an assembler/disassembler/editor at £29.95, or £39.95 for cartridge, or £36.95 for disc; Scribe, a £14.95 cassette to give lower case and other features; and Graphics Toolkit, £9.95 or £11.95 for disc, which adds features like 11 new BASIC words and 10 other routines.

New Oric, Spectrum, 32K BBC and TI-99/4A tapes were released by PASE, all costing £4.99. They are, for the Oric, Worm and Machine Code Monitor; for the BBC micro, a version of the Oregon trail game Westquest; Freddy and Munchman, two classics for the Spectrum; and, for the TI, City Blitz/Persac.

Coming soon: three games for the Oric, two for the BBC and a range for the TI-99/4A with Extended BASIC.

Salamander has licensed Gridrunner — written for the VIC-20 by Jeff Minter of Llamasoft — and converted it for the Dragon. It costs £7.95, needs a joystick and features Earth, AD 2190, as a wasteland with the human race's only hope resting with an orbiting power station. Gridrunner is a spaceship with a mission to protect the station from evil droids.

Salamander's two other releases are Franklin's Tomb, a single-player adventure at £9.95, and Everest, costing £7.95, both for the Dragon.

A new low-cost printer is due out in September from dk'tronics — at about £50 cheaper than similar models. Managing director David Heelas and sales boss Peter Brownley are just back from Taiwan, Japan and Hong Kong and examined two printers.

And the one they are most likely to put on sale will be a version of the four-colour printer/plotter — which uses tiny ballpoint pens on 4½-in paper rolls — at present being marketed by Tandy, Oric, Micro Peripherals and, most recently, Commodore. Mr Heelas reckons he can sell it for £99.95, including an interface for the Spectrum, because of his lower costs.

Rabbit partner Heather Lamont, 22 — with cuddly mascot

dk'tronics showed two new Spectrum games, Invaders at £4.95 and Maziacs at £6.95 for the 48K model, bringing its total to 15. And in the next couple of months, said Mr Heelas, the firm would be adding tapes for the Atari, Dragon, Commodore 64, VIC-20 and BBC to its Spectrum and ZX81 ranges.

A new add-on board for the VIC-20, costing £20.70 from Stack, gives an additional 3K of RAM plus sockets for two 4K EPROMS. The company also had a light pen for the BBC micro, costing £28.75 with a cassette game.

New add-on memory packs were shown by Downsway, best known for its ZX81 RAM packs. They are: 16K for the VIC-20 — switchable for 3K, 8K or 16K operation — 48K and 16K RAM packs for the Jupiter ACe and redesigned RAM packs for the ZX81 in 64K, now switchable, and 16K versions.

Commuting will never be the same after Trax, a new game at £5.50 for the Spectrum and Commodore 64, by Soft Joe's. Complete with sound, a train chugs around the screen collecting passengers — and trying to avoid the killer train. A VIC-20 version is due out in about a fortnight.

A&F's batch of new games were Oric Painter at £6.90 — a version of its BBC and Spectrum cassette — Swashbucklers, a four-player action game for the Dragon, also costing £6.90, and four for the BBC model B at £8: Bouncer, in which you catch "Beeboids" with an anti-matter scoop; Howszat, a graphic cricket game; and two text adventures, The Shrinking Professor and Horror Castle.

Six games for just £7.50 are being offered by Carnell, which has repackaged them into a compendium for the 16K ZX81. More games, mainly for the Spectrum, are to be launched by Carnell in September or October. At the show Carnell held the final of its Volcanic Dungeon competition, to win a holiday for two in Florida, based on its £5 adventure for the 16K ZX81, 48K Spectrum and Dragon.

Turn your 16K ZX81 into a professional class word processor, said Data-Assette, which launched Interact's X-Word in a 16K ROM package. Costing £39.95, it plugs in to offer many of the usual word processing features, including the option of upper and lower case output through an RS-232C interface or the ZX Printer.

Anirog showed 3D Time Trek, at £5.95 for the Commodore 64, along with Mini Kong, a costing £5.95, a new version of its Krazy Kong, re-written to run on the unexpanded VIC-20.

A new deal for 48K Spectrum owners will be offered soon by Spectrum Games, said chairman David Ward. He believes they have been disappointed at games written for both models, so his firm's range is being re-written to make use of the 48K memory — but with the 16K version on the other side.

Spectrum brought out five new titles, all at £5.90, at the show: Kong, Armageddon and Manic for the Spectrum and Rocket Command and Cosmic Intruders for the VIC-20. Due soon are three games each for the Oric, Dragon and Commodore 64.

Mike Meek, managing director of Mikrogen, said his company has holding back its new releases until late August, to catch the Christmas sales. It would then have six new games, mainly for the Spectrum.

A bumper bundle of nine new tapes — five for the Spectrum and four for the 32K BBC micro — was launched by Bug-Byte. One of them is General Election, for the Spectrum at £6.95. Sales boss John Phillips expalained: "It wasn't that we couldn't get it out in time...the election was called early. She let us down. If you are disappointed with the result — which 56 per cent of the population will be — here's your chance to do something about it."

Bug-Byte's other four new Spectrum games all cost £5.95. They are an undersea game called Aquarius; Styx, described as a combination of a maze game and ▶

SPECIAL REPORT

Frogger, Pool and Manic Miner. Mr Phillips described the last one like this: "It's in 16 levels and I think it's going to be the best Spectrum game. It's almost insanely complex."

The BBC tapes are Oblivion and Sea Lord, two arcade games at £7.50, and Old Father Time and Graphics Pack, both at £9.50.

Arcade brought out a game with a familiar-sounding name — Raider of the Lost Mine — along with Grid Run/ Pontoon, both priced at £5.50 for the 48K Spectrum.

Empire is a one-player strategy game for the Dragon at £6.95. Your task is to destroy the evil Dragon empire. Shards, which is marketing it, says the automatic playing feature allows you to "sit back and watch the world being overwhelmed."

Bamby, all the way from the Isle of Harris, brought out new games for four computers. For the Dragon: Scanner 13, costing £8.45, is an arcade-adventure set in a city of the future; Bopswizzle is a "fun game" for £5.95; and Alien Oddessy (the spelling is correct) is a six-part adventure, with the first two parts on a £9.95 cassette.

For the TI-99/4A: Underground Adventure at £8.45 and two at £6.50 — K-64, a chess-type game, and Alone at Sea, in which you escape from a sinking ship. For the 48K Spectrum: Master Code and Mystery Manor, both costing £6.50. And three for the ZX81, all priced at £5.95: Bio-Rhythms, Spelling Tutor and Treasure Island.

Homelink is a new service from the Nottingham Building Society which uses a computer to offer "teleshopping", a magazine, all of Prestel's pages and building society transactions — as long as you have an NBS account.

New generation brought out an action game called Knot in 30 for the 48K Spectrum.

GP Software brought out a version of the LOGO language, priced at £9.95 for the 48K Spectrum, which has easy-to-use graphics and is popular in education because of its simple structure.

Where to find them

● In order of appearance

C-Tech Software, 184 Market Street, Hyde, Cheshire
Kansas City Systems, Unit 3, Sutton Springs Wood, Chesterfield S44 5XF
Kuma Computers, 11 York Road, Maidenhead, Berks SL6 1SQ
JRS Software, Cheshunt Building, Bateman Street, Cambridge CB3 1LZ
Sunshine, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF
Imagine Software, Masons Building, Exchange Street, Liverpool L2 3PN
Romik Software, 272 Argyll Avenue, Slough, Berks
Microdeal, 41 Truro Road, St Austell, Cornwall PL25 5JE
Rabbit Software, 380 Station Road, Harrow, Middx HA1 2DE
Opus Supplies, 158 Camberwell Road, London SE5 0EE
Quicksilva, 92 Northam Road, Southampton SO2 0PB
Kobra, Unit 8, 1-7 Broomfield Road, London W13
Premier Publications, 208 Croydon Road, Anerley, London SE20 7YX
PASE. 213/215 Market Street, Hyde, Cheshire SK14 1HF
Salamander Software, 17 Norfolk Road, Brighton
dk'tronics, 23 Sussex Road, Gorleston, Gt Yarmouth, Norfolk
Stack Computer Services, 290-298 Derby Road, Bootle, Liverpool L20 8LN
Downsway Electronics, Downsway House, Epsom Road, Ashtead, Surrey
Soft Joe's Software, Business Centre, Claughton Road, Birkenhead, Merseyside
A&F Software, 830 Hyde Road, Gorton, Manchester M18 7JD
Carnell Software, 4 Staunton Road, Slough, Berks SL2 1NT
Data-Assette, 44 Shroton Street, London NW1
Anirog Software, 26 Balcombe Garden, Horley, Surrey
Spectrum Games, Ground Floor, Ralli Buildings, Stanley Street, Manchester 3
Mitrogen, 24 Agar Crescent, Bracknell, Berks
Bug-Byte, Mulberry House, Canning Place, Liverpool L1 8JB
Arcade, Technology House, 32 Chiselhurst Road, Orpington, Kent BR6 0DG
Shards Software, 10 Park Vale Court, Vine Way, Brentwood, Essex CM14 4UR
Bamby Software, Leverburgh, Isle of Harris PA83 3TX
New Generation Software, The Broomlands, Lyncombe Vale, Bath, Avon
CP Software, 17 Orchard Lane, Prestwood, Gt Missenden, Bucks

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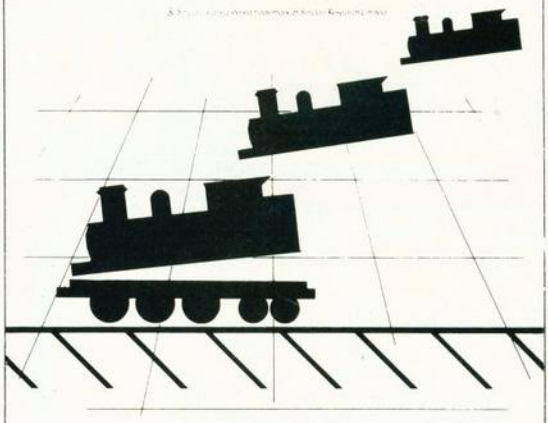

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Where to find arcade action on the TI-99/4A

This week our reviewers look at some arcade favourites adapted for the TI-99/4A.

Man & Monsters £6.00

Stainless Software, 10 Alstone Road, Stockport, Cheshire

Perhaps the inflated price includes a bottle of aspirin! The sound at the beginning of the game and when the monsters move is enough to give anyone a headache.

You are in a multi-storey building and your task is to paint the floors, while monsters track you down. If you complete the painting without being caught then you can dig holes and lure your pursuers to their death. But be careful not to fall into your own traps or tumble off ladders or edges of levels.

You have a long supply of oxygen but don't let this fool you — it can run out. A fresh supply of oxygen is given to each of your three men. Arrowed keys control movement and K and L wields your pick-axe to left or right.

There is a long delay between the game segments, and the colour contrast on the replay instruction screen and the score could be better. This is quite an amusing game, if a little slow.

C.E.

instructions	90%
playability	70%
graphics	90%
value for money	65%

★ ★ ★

Dodger Extended Basic £4.50

Firefly, 48 Dorset Street, London W1H 3FH

You'd better check up on the Green Cross code before attempting Dodger — an adaptation of Frogger. Your objective is to reach home, but you only have three lives with which to do it.

To get there you must cross five lanes of traffic, dodge the giant spiders, then swim the river taking care to avoid the crocodiles, speedboats and, finally, the octopus. You have four homes to occupy, and each home may only be entered once.

If you do manage to safely find your way to all four homes, there's no sitting back feeling pleased with yourself, for the game starts all over again. This time the pace is even faster!

Movements are controlled from the keyboard — a pity joystick control isn't provided as an optional extra.

All the graphics are superb. Even the opening title and instructions are, literally, flashy! Full use has been made of the sprite capability of Extended Basic to provide action every bit as exciting and addictive as the arcade original.

J.W.

instructions	90%
playability	100%
graphics	100%
value for money	100%

★ ★ ★ ★ ★

Wonkapillar £6.00

PS Software from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

You are the Wonkapillar, trying to escape from a series of mazes. But a few new twists make this slightly different from the other maze games on the market.

You start out inside a square maze, and the only means of escape is to blow yourself out with a time bomb. But don't set the fuse too short, or you'll blow yourself up as well.

As you travel about the mazes, you leave segments of your body behind. Collide with one of these or the wall of the maze, and you're a dead Wonkapillar. At least there are no ghosts or other nasties to look out for.

You get a score for getting through each part of the maze, and also for passing over pieces of fruit lying around at various locations. Reach the end of one maze and you find yourself in the centre of a second one, up to a total of eight. Reach the end of that, and you might find your name in the high-score table.

You can use the direction keys to move around or change them to the keys of your choice at the beginning of the game.

D.B.

instructions	60%
playability	60%
graphics	50%
value for money	50%

★ ★ ★

North Sea £3.50

Christine Computing, 6 Florence Close, Watford, Herts

An arcade game in which your task is to sink supply ships moving from left to right across the top of the screen.

To do this, you must first manoeuvre your gun under the ship before firing. The computer keeps count of how many ships you sink and how many escape.

Because the game is written in TI Basic, play is very uneven — for example, all movement stops while your bullet moves up the screen.

The limitations of the programming language mean that the game inevitably lacks excitement, though it is well written and well error-trapped.

D.G.

instructions	85%
playability	40%
graphics	40%
value for money	40%

★ ★

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Will Rabbit run and run?

Rabbit is a veteran company by the standards of the home computer software market. How did it first spot the potential in programs, and where does it go from here? Candice Goodwin reports

Rabbit is one of the better-known names in software for the VIC-20, and the company has been around since the VIC's arrival in the UK. But it started as just a sideline for Cream Computers, a computer shop specialising in business microcomputers.

One of the Cream's employees wrote software, so the company thought it might be a good idea to try and sell a few games by mail order, under the Rabbit label. Ads were placed in the computer press in the summer of 1981.

The orders started to come in and then, just before Christmas that year, Rabbit really started to take off, along with a surge of interest in the VIC. That Christmas Eve, Cream Computers had a consignment of VICs and, according to Terry Grant, "we had people queing up outside the door. We did £10,000 worth of business in two hours."

Some of the faces of Rabbit. From left to right, top row: Lorraine Hague, Terry Grant, Tania Laufer, Tracy Braxton. Bottom row: Lisa Fitzpatrick and Stuart Barnes

From being a sideline, Rabbit has now overtaken Cream. The success of the mail-order business resulted in a decision to go into retail outlets, and it was then that the programs were dressed up in the distinctive red packs that many VIC owners will know and love. But Rabbit still wasn't sure what direction its software would take.

If you look closely at a Rabbit retail display you'll see that there are actually two different rabbits — a "semi-serious" rabbit on the cassette boxes and a cartoon rabbit on the stand. The serious rabbit was designed in the days when the company was hedging its bets between business and games software, and wanted a logo that would do for either. But the cartoon bunny reflects its decision to go for games.

Rabbit now has a large range of action games for the VIC-20 and some for the Commodore 64. It has just brought out 14 new games, at a new lower price of £5.99. And by the time you read this, it will probably have launched some Spectrum programs too.

The programs are sold mainly through retail outlets: Currys, Laskys "and all good dealers — a good dealer in our opinion being one that stocks Rabbit software."

It also has distributors in Norway, Sweden, Denmark, Canada, Australia, Iceland, USA and Greece.

The company is sticking to arcade-type games "because they sell." But it doesn't believe in sticking to the old favourites. "You have to bring out different ones all the time — all our games are completely different."

Rabbit did once try its hand at adventure games, but the experiment was not a success. Not because the games didn't sell. Terry recalled: "we kept getting phone calls from people who'd got stuck at some stage of the game and wanted us to get them out. It started to get a bit out of hand." The adventure games are still around, but the company tries to keep their existence very quiet.

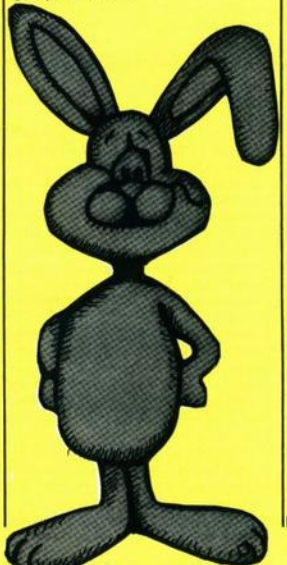
Rabbit's games aren't usually written in-house. Its programmer Stuart Barnes spends most of his time putting the finishing touches to submitted programs: adding in title pages and joystick control.

Rabbit used to do all its own duplicating, with 40 tape decks connected up to one VIC. Now it uses a duplicating company. But plans are in progress to set up its own data duplication facility in Speke, Liverpool. The company has already bought a winding machine, a mastering and a duplicating machine, which are sitting in the offices at 380 Station Road, Harrow, waiting for the move up north.

With the aid of its new duplication facility, Rabbit will presumably be able to run even faster. Which reminds me — where did it get that name?

Apparently, it came from Rabbit director Heather Lamont's toy rabbit Roland, but there's some dispute between the two directors over whose idea it was to use it. Said Terry: "Heather says it was her idea. Alan Savage says it was his idea. They both say it was their best idea ever."

Whoever the idea came from, it's certainly a name that sticks in your mind. So it's only fair that by way of recognition, Roland should now be the company's mascot.



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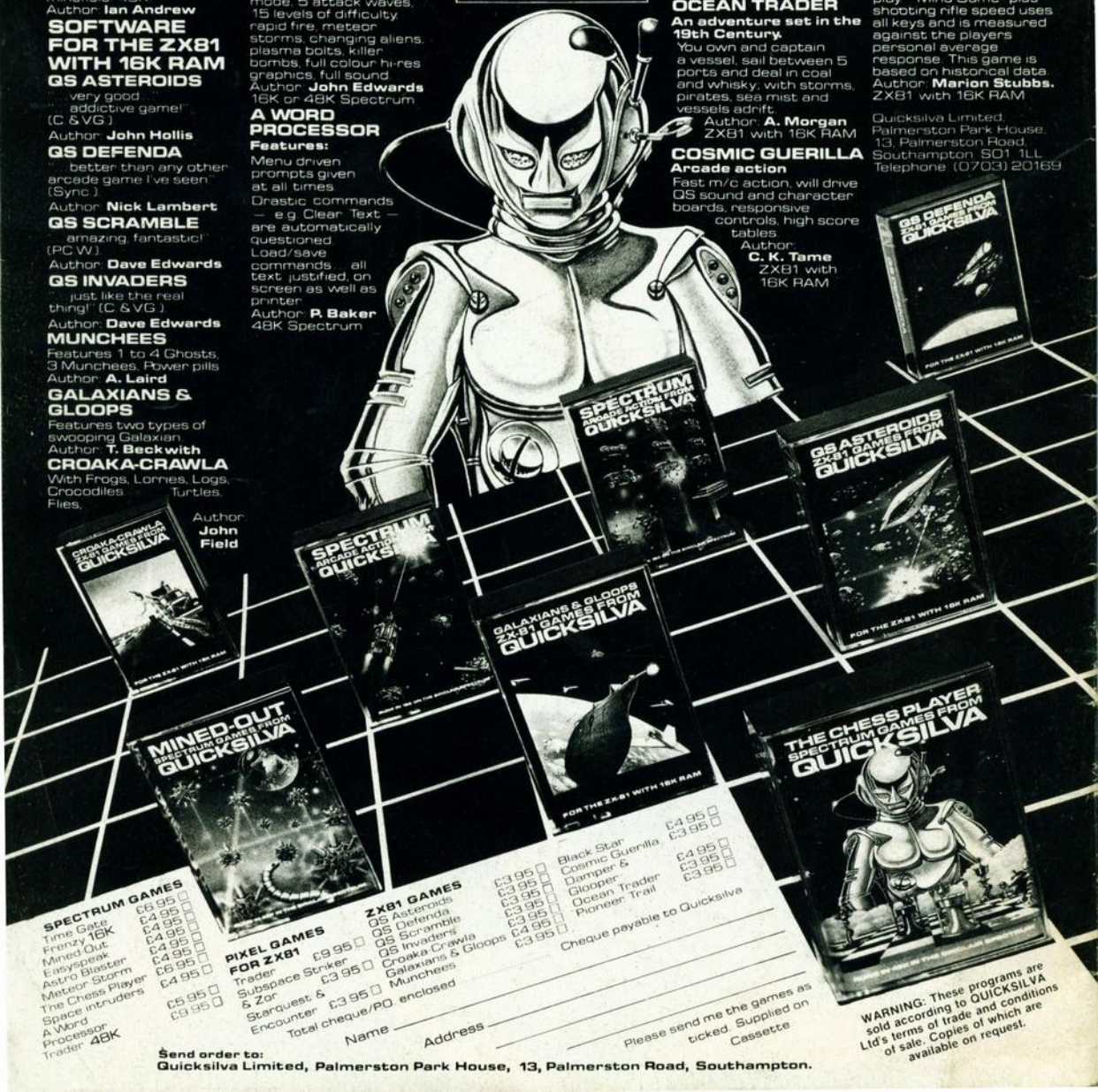

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