Home Computing WEEKLY

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An Argus Specialist Publication

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38p

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The men behind the Microdrive

A four-man team who took an idea by Sir Clive Sinclair and turned it into the Microdrive mass storage devices.

Heading the team was research and development director David Southward who said: "It's been a difficult project with a lot of problems to solve.

"It has taken a bit longer than we hoped. But we knew it would be difficult because we were doing things which people said could not be done."

Mr Southward, 46, began work on the mechanical side before the Spectrum was launched.

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■ ■ ■

New game: what the Yard says

Scotland Yard is taking an interest in a new computer game called Vandal.

It features a character called Harry O'Hooligan who smashes windows and tries to evade police officers.

If he is caught — or if he strikes a policeman — he is taken away in a police van, complete with siren sound.

Vandal is one of five Spectrum

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ocean

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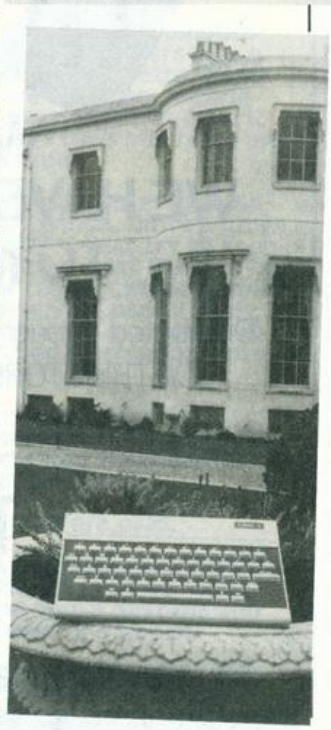

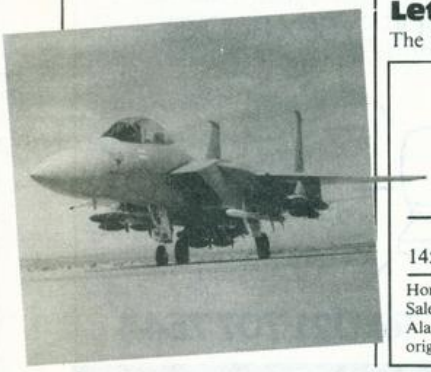

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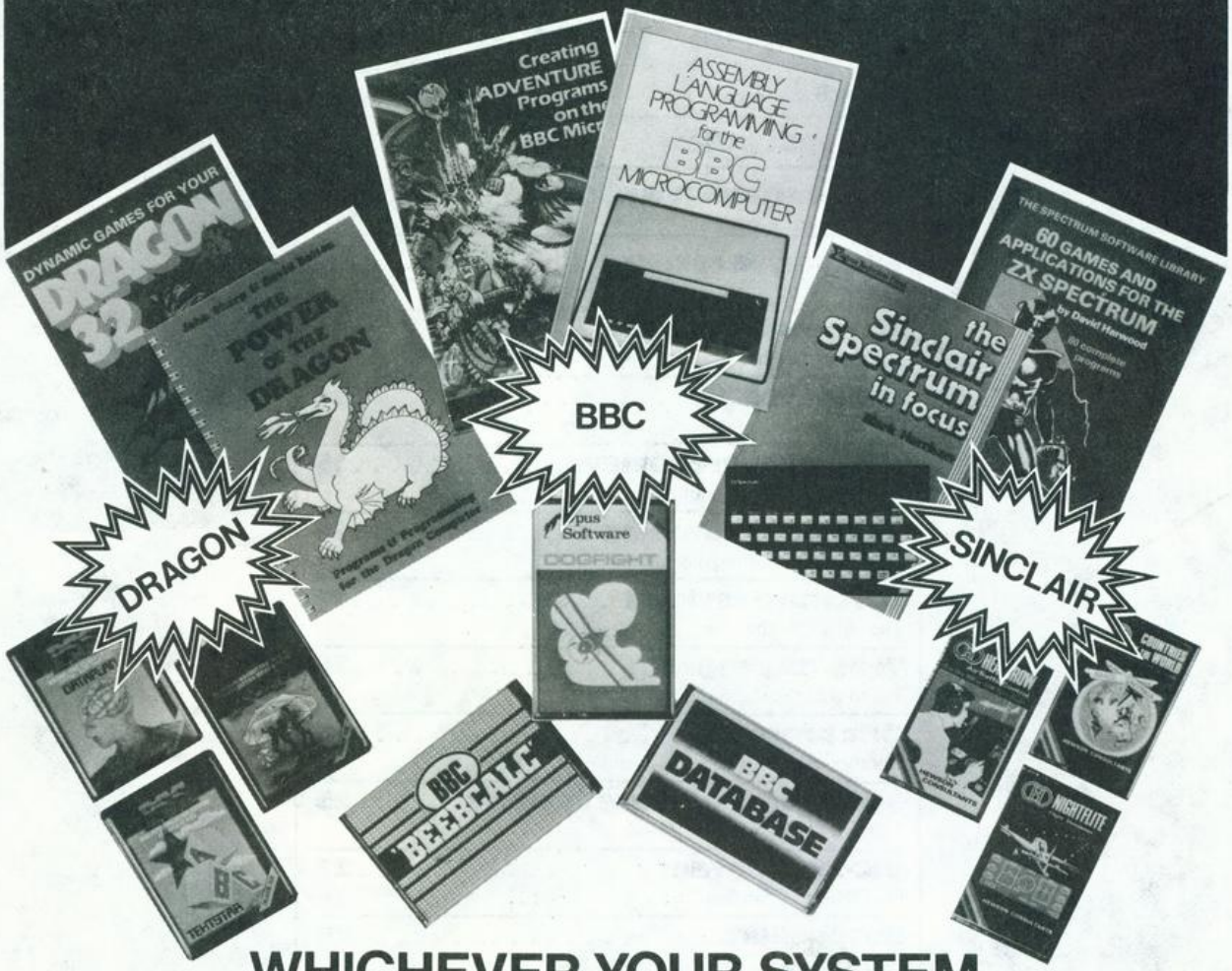

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Continued from front page

Microdrive men (from left) — Ben Cheese, Martin Brennan, John Williams, David Southward

He said: "Clive said 'What we want to do is this' and I came up with various ways of doing it. There were perhaps a dozen different ways.

"The satisfaction is not when it's launched but when a year or so has passed and there are tens of thousands of people with them.

"That's what really counts; that's what R and D is about."

Mr Southward, who works at Sinclair's St Ives laboratory, was recruited by Sir Clive from his earlier company, Sinclair Radionics, which has been taken over by the National Enterprise Board after running into money troubles.

John Williams, a colleague at St Ives who worked with Mr Southward on the ZX Printer, looked after the detailed mechanical design and Ben Cheese and Martin Brennan, both based in Cambridge, were responsible for the Electronics and software respectively.

They have also spent a lot of time at the manufacturers helping to get production under way.

Microdrives, which cost £49.95 each, have a 12 month warrenty and run tape in tiny cartridges at 30in a second with a claimed minimum storage capacity of 85K.

Each cartridge, costing £4.95, contains 20ft of tape — similar in quality to video tape — with two tracks on a width of a little over one-sixteenth of an inch.

The Microdrives have to be connected to Spectrum via the ZX Interface 1, costing £29.95 with Microdrives, or £49.95 separately.

As well as controlling up to eight Microdrives, the unit incorporates the industry standard RS-232 interface — allowing the computer to be linked to other computers and peripherals such as printers — and a network of a maximum of 64 Spectrums, provided none is more than 30ft apart.

A handful of software houses has already got the new equipment so they can produce software on cartridge.

Sinclair's managing director, Nigel Searle, said: "Initially there's not going to be a huge market. Although there are half a million Spectrums out there, there are not half a million Microdrives.

"I would think that it will follow the same pattern as cassette software. I would guess that someone will set up a duplicating service for Microdrive cartridges for the software companies."

Sir Clive, questioned later about the Government's approach to computers, said that the fifth generation of computers needed a central laboratory employing the country's best minds.

He said: "It needs to be done on the same principle as the atomic bomb.

"This new industrial revolution is as dependent on semiconductors as the first was in the manipulation of metal."

• **Microdrive review — see pages 11**

Sinclair Research, Camberley, Surrey GU15 3BR

Continued from front page

games, all at £5.95, just out from Apogee Games, trading name of Dialgrove.

Marketing director Chris Mallet, 28, said he and his brothers and fellow directors, Gareth and Chris, thought hard before deciding to bring out the game.

It was sent in by an unemployed Welsh student and originally, said Mr Mallet, "there was a certain amount of blood and we toned it down." The police were also missing from the original.

Mr Mallet said: "We first looked at it in April. At first we were not going to market it. We naturally thought it might encourage people.

"But now people grab you. You have no chance of winning if you hit a policeman. There is a chance of getting away if you break a window.

"There's always the problem of people being encouraged by these things. But I think it will keep them at their computers all day rather than throwing stones at windows.

"We hope the name Harry O'Hooligan will not encourage people to think only Irish people throw stones."

A Scotland Yard spokesman said: "Obviously, anything which encourages people to go out and do the real thing is a bad thing.

"Vandalism is a very big problem in London. Last year criminal damage increased by eight per cent over 1981, from 87,000 incidents to 93,000 in the Metropolitan Police area.

"We have not come across it, so it's too early to say if it will have any harmful effects on young people."

Apogee's other four tapes which have just been launched are three space games — Space Mite, Moon Strike and Lazer — and a version of Frogger called ZX Froggy.

Dialgrove, 10A James Street, London WC2E 8BT

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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Keep a copy of your submissions and include an SAE if you want them returned. Label everything clearly and give a daytime and home phone number if you can.

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

Commodore: VIC-20 goes on — and up

Commodore, expecting to outsell Sinclair computers soon, has condemned a report that VIC-20 production is to cease shortly.

Marketing boss John Baxter stressed: "Any rumours you hear about us withdrawing the VIC are nonsense."

Software houses Imagine and Quicksilva said they were now turning to the Commodore 64, which has 64K for the new price of £229. The unexpanded VIC-20 has 3½K and costs £139 for a package which includes a cassette recorder.

Imagine is soon to bring out a VIC-20 arcade game called Bewitched and general manager Bruce Everiss said: "We are not going to do any more games for the VIC.

"They are to stop making it this month. I'm not being dogmatic about August, but it's our perception that the VIC has only a limited life.

"It's cheaper for them to make a 64 than a VIC and also the VIC is totally out-classed by the Spectrum and Oric — even the Atari — on price and performance."

Mark Eyles, a Quicksilva director, said his company had no reports about VIC-20 production coming to an end.

He said: "We are no longer actively looking for games for the VIC-20. We are heading for the 64. It seems to be filling the gap in the market at around the £200 mark."

Mr Baxter said rumours may have got around because Commodore in America had stopped taking order for the VIC-20 — but only because of the demand.

He said: "You have got to plan months in advance and they took so many orders for the VIC — and they planned to make a million — that they had, not unnaturally, closed their order books.

"We are beginning to get into the same situation in the UK. We are fairly certain we can sell all our computers until the end of December. We put forward phenomenal sales targets.

"We are even asking other countries to let us know if they don't want all of theirs. I can guarantee that not only will we be producing until Christmas but for long after.

"If no-one wanted it we would withdraw it. But, to give an example, we sold 50,000 in June — along with 10,000 64s — and we could have sold a lot more VICs than that. We can sell more than we can produce.

"We are bringing out at least 15 more VIC programs by the end of the year."

And this is what Mr Baxter had to say about the competition: "Not only are we out-selling Sinclair, we are swamping them worldwide. We will also do this in the UK, not yet, but we will.

"We believe that in the UK we are selling 50 per cent by value and he has got 50 per cent by volume."

This meant Spectrum and ZX81 sales totalled 22 per cent of sale by value and Commodore's was 30 per cent by volume.

He said: "We are not sure whether we will beat him by volume this year, but we will beat him by value. We are selling more in America than Sinclair sells worldwide."

Commodore, he said, had 33 per cent of the US market, selling 5m computers.

Where to take those upgrade problems

We have had a number of letters from readers with problems regarding upgrades from the 16K to the 48K Spectrum. If this sounds like you, then the address to write to is Sinclair's Camberley office, below. Alternatively, ring Camberley on 0276 685311.

Sinclair Research, Stanhope Road, Camberley, Surrey GU15 3PS

Hitch for mail order plan

The Computer Trades Association has run into a snag with a proposed bonding scheme to protect mail order customers.

General secretary Nigel Backhurst said: "Two of the insurance companies we have spoken to have turned it down because there are too many variables in the market.

"It looks as if we would have to go to Lloyd's, which would mean the scheme would cost more."

The CTA began looking at the possibility of a bonding scheme — financed by the software companies — after receiving between 300 and 400 letters. Customers could claim for late or non-delivery.

Now it was planning a conference, probably in September, where software houses, magazines and the Department of Trade could discuss the issue.

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

The Aquarius, with plug-in Mini Expander (right) and Home Controller. Two remote control modules for home appliances are on the left

Micros amongst the groceries

Computers will soon be on sale in TV hire shops and alongside groceries in hypermarkets.

Radio Rentals are test marketing the £79.95 Aquarius this month and next. And Asda, the big hypermarket chain run by Associated Dairies, has agreed to sell the computer. So have other stores.

Mike Lunch, managing director of distributors Mattel, said Mattel, said Radio Rentals had been a long-standing customer for Mattel's Intellivision games players.

He said: "I'll put the computers where the people are, not where the expertise is."

But retailers had to carry a wide range of peripherals, make demonstrations, have staff training and have enough traffic through the store to make it worthwhile.

He said he even saw the computer going on sale in DIY shops and furniture showrooms, saying it was an entry-level machine designed for the family.

Mattel officially lauched the Aquarius here last week. The basic unit measures 13in by 6in with 49 Spectrum-like keys and 4K of RAM.

Add-one available at launch include a thermal printer (£139.95), cassette recorder (£49.95), Mini Expander with games controllers (£49.95), and 4K (£19.95) and 16K (£29.95) RAM packs.

There are 256 graphics characters, 16 colours on screen and a resolution of 320 by 192 pixels, or 40 by 24 characters.

Microsoft BASIC is built in and a range of games, education and home management cartridges will cost £19.95 to £49.95. Several Intellivision cartridge games have been adapted for the Aquarius.

● Mattel also demonstrated a home control system which, using the Aquarius, will control lights, appliances, central heating and any other electrical device.

A Home Controller unit and two modules will cost about £100 when available in the UK early next year.

The modules are plugged into wall sockets and appliance connected to them. And the Home Controller sends signals along the mains instructing them to turn on or off.

Mattell said up to 256 appliances can be controlled for up to 32 on/off switchings in seven-day cycles. Graphics guide the user on programming the unit.

Mr Lunch said the advantages included energy saving, security and convenience.

Mattel Electronics, 3 Fulton Road, Wembley, Middx HA9 0AE

US giant plans TV software ads

American company Parker Video Games is moving into home computer software, and plans to spend $6 million over the next few months to push its wares in the UK.

Television ads will tell British buyers about Parker's programs for the Atari 400 and 800 and VIC-20, as well as for dedicated games machines.

Parker Video Games, Palitoy, Owen Street, Coalville, Leics LE6 2DE

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Do you sincerely want to be conned?

As the owner of a working micro, the attitude of many home computer buyers makes me sick.

People without the slightest interest in computers and their uses are rushing out like lemmings to buy them — just because, all of a sudden, computers are the thing to have.

We've seen it all before, of course. Electric toothbrushes, sunbeds, tea makers, video recorders, Sony Walkmans (Walkmen?) — just five out of a long, long list of expensive consumer goodies which people with more money than sense feel that they have to buy.

And why? Just because, as Amundsen said on his reasons for going to the North Pole, because it's there. Or because the Jonesses have got one. Or because, well, that's progress — isn't it?

Some of these items can and do make life easier and more pleasant. You might buy a video recorder to avoid the expense of going out to the cinema, or because you work nights and always miss your favourite TV programmes. A Sony Walkman might make your journey to work more tolerable — and be easier on the ears of your fellow-passengers than a blaring transistor radio. So let's be charitable and assume that most people buy these things with a definite purpose in mind.

However, browsing through the computer mags, time after time I read letters from people moaning that the High Street chains which now stock micros won't tell them what the damn machines are for. What on earth is the point of buying a computer if you don't even know what you want to do with it?

It seems as though spending money — and we're talking about hundreds of pounds now — has become an end in itself. People feel they have a right to be sweet-talked into buying yet another hi-tech gadget they don't really need. They feel hard done by if the sales pitch isn't forthcoming.

I, for example, bought my computer as part of a word processing system, because word processing helps me to do my job faster and more easily. With the help of the computer, I can either do more work and make more money, or do my existing work faster and have more free time. As a £400 tool of my trade, it's cost-effective (and tax-deductible). As a £400 toy, it would be obscenely expensive.

There are all sorts of other useful jobs that computers can and do help people to carry out. Because a computer is programmable, the list is almost endless. But the fact that you can program a computer is the only thing that set it apart from any other tool — a drill, a lawnmower, a liquidiser.

And after all, you wouldn't just wander into the do-it-yourself section of your local department store, your money burning a hole in your pocket, and say to the assistant. "Look, what do these drills do? If I bought a drill, what could I do with it? I want to spend some money on a drill, but first, tell me what it's for."

You might want to know what sort of drill to buy to do a particular job — but would you expect a chain store to give you that kind of information? I certainly wouldn't — I'd go to a specialist shop. And a computer is a lot more complicated than a drill.

No doubt the High Street stores will soon wise up to the vast profits to be made and train their staff to give customers what they want to hear: how a microcomputer will boost their IQ, send their kids to the top of the class, make the breakfast, improve their sex lives and make them the envy of the neighbourhood. But I'm not convinced that it will really be a good thing.

Lynda Shaw
Freelance writer
Halifax, Yorks

Rosalind Bevan and Horton Venture — backed by Dragon Data

Dragon in sponsorship schemes

Dragon Data is putting its money on a horse — and its rider. The company is sponsoring three-day eventer Rosalind Bevan and her horse Horton Venture to the tune of £10,000 a year.

Rosalind, 18, is a near neighbour of Dragon's — she comes from Swansea. She was part of the British junior team that won the recent junior European Three Day Event Championships, and has her eye on the international competition.

Dragon also sponsored the Mirror Dinghy Class World Championships, held at the Mumbles Yacht Club in South Wales. A Dragon-32 micro was used to log times and calculate results during the event.

Dragon Data, Kinfig Industrial Estate, Margam, Port Talbot, West Glamorgan

Now there's two jacks

Jumping Jack has jumped once too often. . . and ended up giving his name to two different games.

Sumlock, the Manchester-based software house, brought out its Frogger-type VIC-20 program Jumpin' Jack about 12 months ago.

And now Imagine has brough out an entirely different arcade game for the Spectrum called Jumping Jack, with an added g.

But the two companies have come to an amicable agreement. Both will continue to market the games for the present machines.

And when Imagine launches versions for the Commodore 64 and Atari the name will change to Leggit. Sumlock will continue with the original name with its Commodore 64 version, due out in August.

Sumlock's sales directo Alan Lee said: "It's a different game and a different computer, but this should avoid confusion. There was no need for any hard bargaining."

And Imagine's general manager Bruce Everiss explained: "We did a search of trade names and the name wasn't there."

Sumlock, 198 Deansgate, Manchester M3 3NE
Imagine, Masons Building, Exchange Street East, Liverpool L2 3PN

Chip in to your BBC

BBC owners can put their own software on to an EPROM (electrically-programmable read-only memory) chip with the Eprom Programmer from Technomatic.

The programmer plugs straight into the BBC, and is driven by software on cassette, disc or even another EPROM. It takes around two to three minutes to program a wide range of EPROM chips.

You can also use it to customise commercially available EPROM chips. It can read, blank check, program and verify at any location on the EPROM.

Cost: £90.85.

Technomatic, 17 Burnley Road, London NW10 1ED

Make your BBC talk back

Just a few weeks after the launch of Acorn's speech chip for the BBC micro, a rival in the speech stakes has come on to the scene.

Smartmouth is a self-contained unit that plugs into the BBC's user port. According to its manufacturer, Technomatic, it can give an unlimited vocabulary

Price: about £45.

Technomatic, 17 Burnley Road, London NW10 1ED

Dragon extras

Elkan has announced three new products for use with the Dragon.

To help with your programming, there's a quick reference guide which fits neatly into your pocket.

It consists of 10 cards joined together concetina-wise, and containing all sorts of useful facts and tips: a memory map, system commands, control codes, special keyboard keys, and much more besides.

The quide is a joint effort by Elkan and US firm Nanos Systems, and apparently contains some information that hasn't yet been published anywhere else. Price: £3.95.

Secondly, the Dragon Cruncher conversion program will convert most Dragon programs for use on the Tandy Colour computer — or, more to the point, convert listings from one machine to the other. Price: £7.95.

Finally, for keen games players there is the Quick-shot self-centring joystick controller, with positive response fire button and contoured grip.

The controller plugs directly into the Dragon — no need for adaptors. Price: £15.95 each, or £26.45 for two. Also available for Atari 400 and 800, VIC-20 and Commodore 64.

Elkan Electronics, 11 Bury New Road, Prestwich, Manchester M25 8JZ

Teaching with animal magic

Four maze games make learning fun in Pathfinder, Widgit Software's new Spectrum tape for young children aged three to eight.

A rabbit has to eat its way through a maze of carrots. A kangaroo can be programmed to hop its way through a maze by remote control. A monster must be guided through a park to eat its picnic in a certain order. And there's a frog who has to get across a lily pond, collecting friends along the way — but without landing on any waterlilies.

Each game has two difficulty levels and colourful graphics.

You can see Pathfinder, which costs £5.95, at the ZX Fair in London on August 20.

Widgit Software, 48 Durham Road, East Finchley, London N2 9DT

Control with no strings attached

Due out soon from Unicorn Research is a cordless joystick for the Spectrum.

It works by sending an infra-red signal to an interface which plugs on to the Spectrum's edge connector, and will initially control any game designed for Kempston joysticks.

Later on, Unicorn hopes to develop a multi-programmable device so that any Spectrum game can be played by remote control. Oric and VIC versions are on the way.

Unicorn is also working on a duplicate keyboard for the Spectrum, for use in two-player games, and a 48K Spectrum adventure game called Elementary, My Dear Watson.

It's a 3D graphic adventure in which you must follow in Sherlock Holme's footsteps and solve 20 cases.

Unicorn, 312 Charminster Road, Bournemouth BH8 9RT

From book to software

Book publisher Collins has followed into the educational software market with a range of children's programs for the Spectrum.

Starting with pre-school children there's What's The Time, then Spectrum First Number, a counting program for four to six year olds. Both were written by primary school teacher Peter McBride, and cost £6.

For seven year olds upwards, Spectrum Know Your Tables aims to put the fun back into table learning. Written by Brian O'Byrne, the cost is again £6.

Finally, Peter McBride has produced a Spectrum Game Writer's Pack to teach children of 11 and over how to design and write their own games. Some ready-made games are also included. Price: £8.

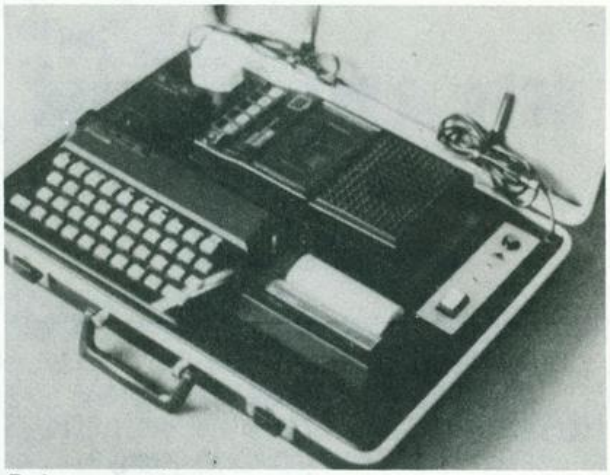
Collins Educational, 5 Buckingham Place, London SW1

Sixty-four varieties

It's no surprise to find that The Six-Four Supplies Company specialises in products for the Commodore 64. In particular, it is selling a range of 64 software imported from the USA.

Its range includes two word-processing packages, Script 64 and Totl. Text; a music synthesiser, Note Pro II; a Forth cartridge; Recipe Box, a database system; and Backup, which allows backup cassettes to be made for VIC or 64 software.

The Six-Four Supplies Company, PO Box 19, Whitstable, Kent CT5 1TJ



Pack away your Spectrum

Spectrum just in case

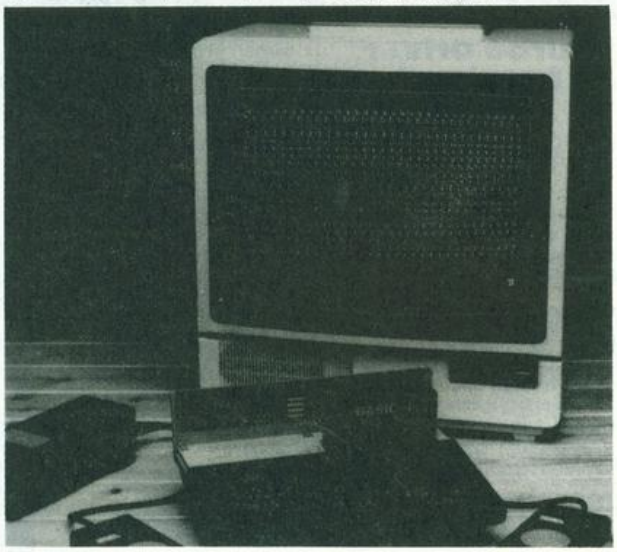
Treetop Designs have brought out a briefcase specially designed to store your Spectrum and accessories, and to double as a console too.

From the outside, it looks like an ordinary black briefcase. But the lid lifts off and inside there's a riased support for the Spectrum, housing for the power pack, recesses for printer and tape recorder and a socket for a 13 amp plug. There's also room for six cassettes and printer paper.

A switch panel allows you to turn the power on and off from the console.

The computer case costs £47.45 including postage.

Treetop Designs, 61 Widmore Road, Bromley, Kent



Sord's M5 — now £40 cheaper

Sord slash

Sord has slashed £40 off the price of its new M5 micro, just a few weeks after its UK launch.

General manager Yoshi Makishima gave two reasons for the price cut:

- Journalists and the retail trade told Sord the original price was too high for hobbyists and students.
- Sord's efficient plants in Japan had brought costs down.

Now the M5, marketed here by CGL, costs £149.95. And people who bought at the higher price are being offered Sord's BASIC G cartridge, usually £35, free of charge.

Sord, Samuel House, St Albans Street, London SW1

Hit the road with your micro

Driving's the theme of these five games. But are they drivingly addictive or will they drive you up the wall?

Roadrunner Spectrum £5.95

Protek, Clydesdale Bank Building, High Street, South Queensferry, Edinburgh EH30 9HW

After reading the cassette insert, I began to get quite excited. I started the tape and eagerly awaited my chance to drive my "turbo charged hot rod round a tortuous course."

On selecting the slow speed option, I was confronted with a full screen, symmetrical maze. I frantically scanned the screen and concluded that the only thing not moving — a strange, black, hat-shaped thing — must be me.

I started to move it around the maze leaving a pink trail behind. When caught by a ghost — why ghosts are chasing the "turbo charged hot rod", I cannot imagine — the program plays an abridged version of "Frere Gustav" (see page 135, Sinclair manual).

On my third attempt I completed the first maze, but I found the second maze to be exactly the same. My last life finished, the program politely informed me that I'd completed "1 screens."

The instructions were quite adequate, but there is not much you can write about such a simple game. One plus point — the program offers a choice of control keys:

M.T.

instructions	75%
playability	30%
graphics	30%
value for money	30%

★ ★

Race Fun 48K £5.99

Rabbit, 380 Station Road, Harrow HA1 2DE

This is a motor race simulation. On the left of the screen you have a speedometer, a fuel game, and current and highest scores. To the right you have a plan view of a race track with wide and narrow sections.

There are other cars on the track, moving at their own speeds, and you have to try to avoid contact with them.

While the program provided good and colourful graphics and a clear sense of competition with the other cars, there were some slight weaknesses.

When the speedometer shows zero speed, your car is still moving at a rate of knots, and you may think you are getting somewhere, but the score does not increase.

When fuel is exhausted, a distorted off-key version of the start of the funeral march is played. For anyone who has lost friends in motor racing accidents, this seems crass bad taste, to put it mildly. It is scarcely cheeful for anyone. **D.T.**

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

★ ★ ★ ★ ★

Turbo Driver Spectrum £5.95

Bos, Flockton House, Audby Lane, Wetherby, W.Yorks LS22 4FD

Turbo Driver doesn't quite match up to the specialised game console versions, but, then again, it doesn't cost £29.95!

Your car is left standing on the start line, and you must weave your way through many hazards, before catching the pack. It is then a question of trying to keep out of trouble, and in the lead, while four other cars try to carve you up!

The screen display is very fast and smooth-scrolling though the hoped-for 3D effect isn't quite right. Don't expect spectacular technicolour crashes either.

Each time you hit a hazard or a barrier, you simply use more fuel, and thus finish that bit sooner than you hoped. I suspect that the addition of a Kempston Joystick, for which the game is set up, would add to your chances.

I found the program good fun, without having to learn a million new buttons to press. And I was impressed by the sound. If the Spectrum has only a single channel sound device, how do they produce the horn effect which sounds like a chord? I have an idea, see what you think!

All in all, well worth adding to your collection, and a pleasant change from alien zapping. **D.M.**

instructions	60%
playability	90%
graphics	75%
value for money	90%

★ ★ ★ ★

Daddie's Hot Rod TI-99/4A £5.95

Lantern Software, 4 Haffenden Road, Tenterden TN30 6QD

The idea of this game is to drive your dad's Hot Rod car around the block while collecting hitch hikers and taking them to a garage on the way. Your car is displayed in the middle of the screen and the road scrolls up towards you.

You score a point each time you complete the course, and each time you transport a hitch hiker to the garage.

The program loaded first time and the only bug I found was that the program occasionally paused for a second or so, sometimes distracting your attention and making you crash.

The screen display was very good and colour and sound were both used very well.

Instructions were displayed on the screen at the beginning of the program, but they did not explain how to collect hitch hikers, or how to drop them off at the garage.

All in all, I enjoyed playing this game, and although it wasn't as fast as a game written in machine code, it was faster than most programs written in TI BASIC. **J.J.**

instructions	65%
playability	85%
graphics	90%
value for money	80%

★ ★ ★ ★ ★

Light Cycle Spectrum £5.95

PSS, 452 Stoney Stanton Road, Coventry

Light Cycle is a futuristic version of the old game Surround, where you create an ever-lengthening wall in an attempt to trap the computer into crashing its wall into yours, or forcing it to move off the edge of the play area.

The PSS program has not added much to this old plot, and I found the graphics a little disappointing. There was nothing faintly resembling a cycle in the screen display, just thin lines described as laser trails.

On the plus side, the sound effects were excellent, true arcade quality. Nice crunching noises for the explosions were coupled with rippling colours in the screen border. Quite a lot of skill is needed to beat the computer even when the game is set on its lowest level.

Perhaps computer buffs who don't remember Surround would enjoy whiling away a few hours with Light Cycle, but those of us who do remember, might feel that more could have been done graphically to breathe new life into this old classic. **M.D.**

instructions	90%
playability	85%
graphics	70%
value for money	60%

★ ★ ★ ★ ★

Microdrive: does it live up to the promises?

In the first full review, David Nowotnik gives his verdicts on Sinclair's new mass storage device, and the Interface unit

Can it really be true? After 14 months of "coming soon" Sinclair's Microdrives have actually arrived. For me, the realisation of that fact occurred when a review model turned up at my local station the day following the launch.

The equipment arrived without the colourful packaging now associated with Sinclair's products.

I got down to a close examination of Uncle Clive's latest innovation.

By now you might be aware that an interface is necessary to use the Microdrive. The unit Sinclair provided is called ZX Interface 1, and you can use up to eight Microdrives with this interface. This unit is black, measures nine inches wide (the same as the Spectrum) and three inches broad.

It is half an inch deep at the front, and one inch at the back. This wedge-shaped box fits under the Spectrum, inclining the keyboard to a gentle forward angle, making the keys easier to read.

A block connector fits on top of the interface and is fitted into the Spectrum's user port. Before doing this, two of the screws on the underside of the Spectrum should be removed; these are replaced by screws on the interface which lock the unit into position under the Spectrum.

There are four connections at the back of the interface. There is a duplicate of the Spectrum user port for the ZX Printer and other devices, a nine-pin female RS-232 socket, and two 3.5mm jack sockets.

The jack sockets are for the network system. While the Microdrive has received all the publicity, this lesser-known facility on the interface also expands considerably the potential of the Spectrum.

For the ZX Net allows you to communicate with other Spectrums fitted with the interface unit. For example, through this system one Spectrum can access a Microdrive, or use a printer connected to another Spectrum, or transfer programs or data.

The RS-232 interface allows the Spectrum to be connected to a number of devices including professional printers and modems.

On the side of the interface is the port for the Microdrive. A flexible cable is provided to link the Interface and Microdrive.

The ZX Microdrive looks very similar to the prototype appearing in photographs a year ago. It is 3½in deep, 3¼ wide and stands 2in tall. At the front is the slot for the cartridges and an LED indicator light, which lights up when the drive is in operation.

Ports appear on both sides of the Microdrive. For the first drive the flexi-cable linking it to the interface is fitted to the right side. A solid block connector (provided with each Microdrive) fits to the other port to which a second drive can be fitted.

Using these solid connectors, you can have up to eight drives in a row.

The big secret — is it a tape or micro-floppy disc? — was revealed in HCW two weeks ago. The system is a continuous tape. The cartridge is no bigger than a book of matches, 1¾in by 1¼in by ¼in.

The tape is about one-sixteenth of an inch wide and 16ft in length. Each costs £4.95.

The interface unit has an in-built ROM which allows many existing commands to be modified for use by Net, the Microdrives and the RS-232 port.

For example, the command RUN (when used immediately after power up, or NEW) will automatically LOAD a program with a filename of "run" from Microdrive No. 1.

Such a program appears on the demonstration cartridge provided with the Microdrive. This program explains the purpose of the other programs on the cartridge, all of which demonstrate uses of the interface.

Particularly useful is a program called "Dbase prog", which uses a database (also on the cartridge) to explain the syntax and purpose of all commands used in conjunction with the RS-232 interface, Net and Microdrives.

The command to LOAD the program from the drive is: LOAD*"m";1;"Dbase prog". The asterisk, "m" indicates that LOAD refers to a Microdrive and the figure one indicates drive No. 1.

The syntax of SAVE, VERIFY and MERGE is similar.

The Microdrive is fast — but not as fast as the Sinclair claims. The average access time is claimed as 3.5 seconds. However the total time to LOAD the display and attribute files (7K) is eight seconds; 16K of program plus variables took 10 seconds to LOAD.

Part of the demo cartridge provides the check of SAVE/VERIFY and ERASE. It took 18 seconds to SAVE and VERIFY a 7K file, and 14 seconds to erase it.

The Dbase program on the demo cartridge loads files from the Microdrive when requested. Loading times were very variable. The same file took 40 seconds to LOAD on one occasion, 16 seconds sometime later.

Times to load files varied between three seconds and 45 seconds; if you ask for a non-existent file you have to wait 45 seconds for the "file not found" error message.

This demonstration LOADed individual records into RAM; it can be consistently faster to LOAD a complete file as an array.

The CAT command will display on the screen (or send to any other output device) the file names of programs and data on a cartridge, and show the remaining space on the cartridge.

Formatting a blank cartridge (this must be done before it can be used) and use of CAT reveals that only 89K is available on each cartridge. This is somewhat less than the earlier promise of 100K, although Sinclair guarantees that each cartridge will hold 85K or it can be returned for free replacement.

The review units were accompanied by a new 48K Spectrum. Was this unit sent to me as earlier releases of the Spectrum would not work with them?

But, after linking my issue 1 Spectrum to the Interface and Microdrive I can reveal that all was well. It worked as well as the brand new Spectrum.

Two years ago, some continuous tape fast-access devices, nicknamed "stringy floppies", made their way over from America.

Despite their very competitive price compared with disc drives, they never caught on.

However, the "stringy floppy" bearing the Sinclair brand name is a certain hit.

A lot more testing has to be done, but I found little to fault it apart from slow data access and rare error in SAVEing and LOADing.

Time will tell on the reliability of the Microdrive and the delicate-looking tape, but the £80 price tag — if you buy Microdrive and Interface together — is the best opportunity the average Spectrum owner will have to upgrade to a more powerful micro.

It will be particularly attractive to the bored games player seeking more constructive uses for his computer.

A Microdrive connected, showing how the cartridge is inserted

A life on the ocean waves can be risky

Set sail for danger with Bill Freestone's Armada game for the Spectrum

Ahoy there! Why not come sailing with your Spectrum? All you need is 16K.

As you look across the deck of your Elizabethan galleon you can almost smell the salty air wafting through you screen.

But you're not here to enjoy the view, Jim lad. There's work to be done.

The enemy are sailing across your screen and you have to sink them using the ship's cannon. Just press Z, X or C to send a cannon ball hurtling towards the enemy galleon.

The user defined characters are defined at the end of the program to keep them out of the way of the main program loop.

This mean that to start the program you must enter GOTO 300. When saving type SAVE "ARMADA" LINE 300. This will start the program at the appropriate place once loaded.

In case it is not clear which graphics characters should go into which lines they are included in my 'How it works' section.

How it works

100-103 move galleon sub-routine. Line 102 graphics: A,B,B,C,D,,F E

110-134 fire cannon sub-routine. Lines 110,120 and 130 graphic: G. 111, 121 and 131: G. 113, 123 and 132: I

200-205 sink galleon. Line 200 graphics: E,D,F,E

210-240 game over

300-575 define characters

600-640 instructions

```
  1 REM ARMADA BY BILL FREESTON
E FOR HOME COMPUTING WEEKLY
  3 PAPER 7: LET j=0: LET a=0:
INK 0: BORDER 2: CLS
  5 REM Set up sea+ sky+ your s
hip
 10 FOR u=0 TO 8: PRINT PAPER 1
; INK 5;AT u,0;"
                ": NEXT u
 11 FOR u=9 TO 14: PRINT PAPER
5;AT u,0;"
          ": NEXT u: LET s=0
 12 PLOT 0,55: DRAW 255,0
 13: FOR t=24 TO 4 STEP -4: PLO
T 0,t: DRAW 36,0: PLOT 52,t: DRA
W 78,0: PLOT 148,t: DRAW 62,0: P
LOT 228,t: DRAW 27,0: NEXT t
 15 REM DRAW Cannons
 20 PLOT 40,40: DRAW 0,-26: DRA
W 8,0,PI: DRAW 0,26: DRAW -8,0,P
I: PLOT 40,32: DRAW -4,0: DRAW 0
,-28: DRAW 16,0: DRAW 0,28: DRAW
 -4,0: CIRCLE 43,9,1: PLOT 38,4:
 DRAW 0,-2: DRAW 12,0: DRAW 0,2
 30 PLOT 215,40: DRAW 0,-26: DR
AW 8,0,PI: DRAW 0,26: DRAW -8,0,
PI: PLOT 215,32: DRAW -4,0: DRAW
 0,-28: DRAW 16,0: DRAW 0,28: DR
AW -4,0: CIRCLE 218,9,1: PLOT 21
3,4: DRAW 0,-2: DRAW 12,0: DRAW
0,2
 40 PLOT 135,40: DRAW 0,-26: DR
AW 8,0,PI: DRAW 0,26: DRAW -8,0,
PI: PLOT 135,32: DRAW -4,0: DRAW
 0,-28: DRAW 16,0: DRAW 0,28: DR
AW -4,0: CIRCLE 138,9,1: PLOT 13
3,4: DRAW 0,-2: DRAW 12,0: DRAW
0,2
 70 PRINT INK 7; PAPER 1;AT 0,1
0;"SCORE ";s: GO SUB 100
 75 REM Game controlls
 80 IF INKEY$="z" THEN GO SUB 1
10
 81 IF INKEY$="x" THEN GO SUB 1
20
 83 IF INKEY$="c" THEN GO SUB 1
30
 90 GO SUB 100: BEEP .1,-60: GO
 TO 70
 95 REM Moving gallion
 100 INK 7: PAPER 8: IF a=28 THE
N PRINT AT 8,a;"     ": PRINT AT
 7,a;"     ": PRINT AT 6,a;"     ":
 LET a=0: LET j=j+1: IF j>=5 THE
N GO TO 205
 101 PRINT INK 4;AT 6,a+2;" ": P
RINT INK 4;AT 8,a;" ": PRINT ; I
NK 4;AT 7,a;" ": LET a=a+1
 102 PRINT AT 8,a;"[illegible]": PRINT
AT 7,a;"[illegible]": PRINT AT 6,a+2;"†"
 103 RETURN
 105 REM Firing cannons
 110 FOR x=14 TO 11 STEP -1: PRI
NT INK 1;AT x,5;"●": GO SUB 100:
 BEEP .05,-50: PRINT INK 8;AT x,
5;" ": NEXT x
 111 FOR x=11 TO 8 STEP -1: PRIN
T INK 1;AT x,5;"•": BEEP .05,-50
: GO SUB 100: PRINT INK 8;AT x,5
;" ": NEXT x
 112 IF ATTR (x,5)=15 THEN LET s
=s+15: GO TO 200
 113 IF ATTR (x,5)<>15 THEN PRIN
T INK 5;AT 8,5;"※": BEEP .05,-30
: PRINT PAPER 8;AT 8,5;" "
 114 RETURN
 120 FOR x=14 TO 11 STEP -1: PRI
NT INK 1;AT x,17;"●": BEEP .05,-
50: GO SUB 100: PRINT INK 8;AT x
,17;" ": NEXT x
 121 FOR x=11 TO 8 STEP -1: PRIN
T INK 1;AT x,17;"•": BEEP .05,-5
0: GO SUB 100: PRINT INK 8;AT x,
17;" ": NEXT x
 122 IF ATTR (x,17)=15 THEN LET
s=s+10: GO TO 200
 123 IF ATTR (x,17)<>15 THEN PRI
NT INK 5;AT 8,17;"※": BEEP .05,-
30: PRINT PAPER 8;AT 8,17;" "
 124 RETURN
 130 FOR x=14 TO 11 STEP -1: PRI
NT INK 1;AT x,27;"●": BEEP .05,-
50: GO SUB 100: PRINT INK 8;AT x
,27;" ": NEXT x
 131 FOR x=11 TO 8 STEP -1: PRIN
T INK 1;AT x,27;"•": BEEP .05,-5
0: GO SUB 100: PRINT INK 8;AT x,
```

Hints on conversion

Spectrum colours are set using INK and PAPER with the following numbers: 0 black, 1 blue, 2 red, 3 magenta, 4 green, 5 cyan, 6 yellow, 7 white.

Colour commands inside print statements set colours for that print only and not the whole screen.

ATTR (R, C) reads the colour of the character square at position R rows and C columns. In this case it has been used to tell whether the enemy galleon has been hit.

BEEP D,P sounds speaker for D duration in seconds, P pitch in semitones relative to middle C

DRAW X,Y draws line X pixels along and Y pixels up from last PLOT or DRAW command

DRAW X,Y,A draws a line X pixels along, Y pixels up and through an arc of A radians

CIRCLE X,Y,R draws a circle with center X,Y and radius R

OVER 1 allows a character to occupy the same square as another one. If your machine cannot do this don't worry — it's only used to underline the title in line 600

POKE USR "A" + g,r is the way characters are defined on the Spectrum. In this case row g of character "a" is being given the value r

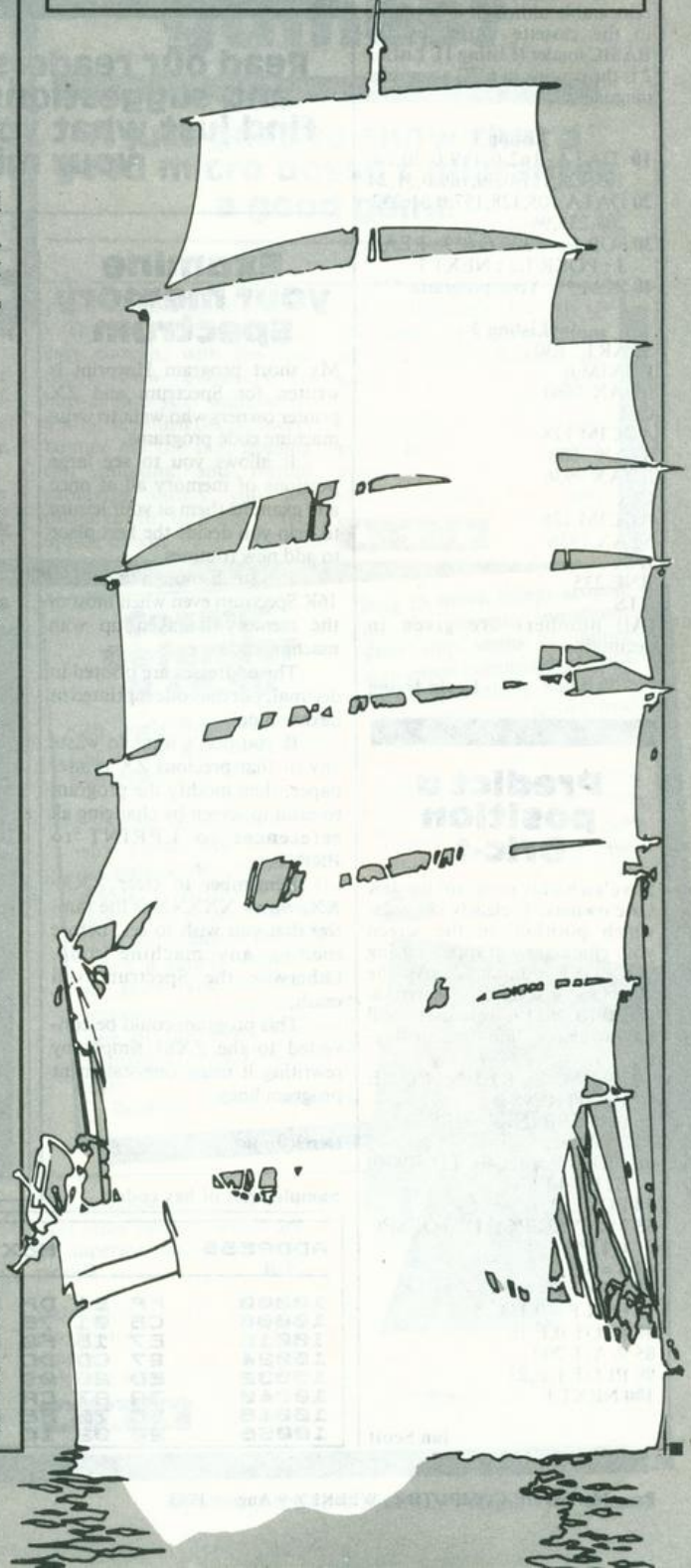
Variables

A column position of enemy galleon
J number of enemy galleons passed (game ends when it reaches five)
P used in a loop to change border colours while waiting for another game to be started
U used to set up sea and sky
R used to draw ship's deck
X row position of cannon ball
S score
G graphics loop variable
R data variable for graphics

SPECTRUM PROGRAM

```
27;" ": NEXT x
 132 IF ATTR (x,27)=15 THEN LET
s=s+5: GO TO 200
 133 IF ATTR (x,27)<>15 THEN PRI
NT INK 5;AT 8,27;"▒": BEEP .05,-
30: PRINT PAPER 8;AT 8,27;" "
 134 RETURN
 200 BEEP .1,6: PRINT AT 6,a;"
  ": PRINT AT 7,a;"  †": PRINT A
T 8,a;"╬ † ": BEEP .2,-6: PRINT
AT 7,a;"  ": PRINT AT 8,a;" †
": BEEP .3,-18: PRINT AT 8,a;"
 ": BEEP .4,-30: PAUSE 50: LET a
=0: PRINT INK 4; PAPER 8;AT x,0;
"
 ": GO TO 90
 205 BEEP 1,0: BEEP .5,12: BEEP
.25,24: CLS
 210 CLS : INK 0: PRINT AT 3,11;
"GAME OVER";AT 5,5;"YOU SCORED "
;s;" POINTS"
 215 PRINT AT 10,10;"TRY AGAIN "
'"  OR ARE YOU FEELING SEA SICK"
 220 PRINT '"BETTER GET SOME RU
M INSIDE YER'" IT MIGHT IMPROVE
 YOUR GAME"
 230 IF INKEY$="" THEN FOR p=1 T
O 7: BORDER p: PAUSE 30: IF INKE
Y$="" THEN NEXT p
 235 IF INKEY$="" THEN GO TO 230
 240 RUN

 300 REM Define graphics
 305 REM Stern of gallion
 310 FOR g=0 TO 7
 315 DATA 255,255,171,255,213,25
5,127,63
 320 READ r: POKE USR "a"+g,r
 325 NEXT g
 330 REM Middle of gallion
 335 FOR g=0 TO 7
 340 DATA 255,255,171,255,85,255
,255,255
 360 READ r: POKE USR "b"+g,r
 365 NEXT g
 370 REM Bows of gallion
 375 FOR g=0 TO 7
 380 DATA 255,143,223,87,142,252
,248,240
 385 READ r: POKE USR "c"+g,r
 390 NEXT g
 400 REM Castle+ Mizzen mast
 410 FOR g=0 TO 7
 420 DATA 144,80,48,16,24,148,24
8,255
 425 READ r: POKE USR "d"+g,r
 430 NEXT g
 440 REM Top sail
 445 FOR g=0 TO 7
 450 DATA 8,8,62,8,8,8,8,8
 455 READ r: POKE USR "e"+g,r
 460 NEXT g
 470 REM Main sail
 475 FOR g=0 TO 7
 480 DATA 8,8,127,8,8,8,8,8
 485 READ r: POKE USR "f"+g,r
 490 NEXT g
 500 REM First cannon ball
 510 FOR g=0 TO 7
 515 DATA 0,60,78,94,126,126,60,
0
 520 READ r: POKE USR "g"+g,r
 525 NEXT g
 530 REM Second cannon ball
 535 FOR g=0 TO 7
 540 DATA 0,0,24,44,60,24,0,0
 545 READ r: POKE USR "h"+g,r
 550 NEXT g
 560 REM Splash
 562 FOR g=0 TO 7
 565 DATA 66,20,160,8,69,146,16,
255
 570 READ r: POKE USR "i"+g,r
 575 NEXT g
 600 INK 0: CLS : PRINT AT 2,11;
"ARMADA"; FLASH 1; OVER 1;AT 2,1
1;"______"
 605 PRINT '"    AHOY THERE LAND
 LUBBERS"'" COME ABOARD,WE'VE G
OT A JOB                FOR YOU"
 610 PRINT '" JUST AIM THE CANNO
NS AND SINK             THE BAD G
UYS"
 615 PRINT 'TAB 10;"ITS VERY EAS
Y"'"          (Unless your cap'n hoo
k)"
 620 PRINT " JUST PRESS:-"'" "Z"
 TO FIRE THE FIST CANNON"
 625 PRINT " "X" TO FIRE THE SEC
OND CANNON"
 630 PRINT " AND "C" TO FIRE THE
 THIRD"
 635 PRINT '"" THE GAME IS OVER
WHEN 5 SHIPS            HAVE PASSE
D"
 640 PAUSE 0: RUN
```



Hey — want to hear a hint?

Read our readers' discoveries and suggestions. You could find just what you needed for your micro

Screen invert VIC-20

This routine will change inverted characters to normal characters and vice-versa. The routine will only work on a 5K/8K VIC-20.

To invert the screen you must call up the machine code with a SYS 830.

The routine is totally relocatable although it is placed in the cassette buffer by the BASIC loader (Listing 1). Listing 2 is the routine in 6502 assembler language.

Listing 1

```
10 DATA 162,0,189,0,30,24,
   105,128,157,0,30,189,0,31,24
20 DATA 105,128,157,0,31,232,
   208,235,96
30 FOR I = 830 TO 853 : READ
   J : POKR I,J : NEXT I
40 REM *** Your programe ***
```

Listing 2

```
START : 830
LDXIM 0
LDAX 7680
CLC
ADCIM 128
STAX 7680
LDAX 7936
CLC
ADCIM 128
STAX 7936
INX
BNE 235
RTS
(All numbers are given in
decimal).
```

Kevin Irving

Predict a position Oric-1

Here's a handy program for 48K Oric owners. It clearly shows at which position on the screen your character will appear, using the POKE command. As the 48K Oric's screen is stored at 48000 to 49119, 16K users will have to change line 40 accordingly.

```
10 REM SCREEN POKE
   POSITIONS
20 PAPER0:INK7 : CLS
30 S = 65
40 FOR P = 48040 TO 49040
   STEP 40
50 POKE P,S
55 ? "=";P SPC(11)"TO"SPC
   (11)P + 39
60 S = S + 1
70 NEXT P
75 FOR F = 0 TO 25
80 PLOT 0,F,12
85 WAIT 200
90 PLOT 1,F,23
100 NEXT F
```

Ian Scott

Examine your memory Spectrum

My short program Hexprint is written for Spectrum and ZX printer owners who want to write machine code programs.

It allows you to see large portions of memory all at once and examine them at your leisure to help you decide the best place to add new routines.

It is small enough to use in a 16K Spectrum even when most of the memory is taken up with machine code.

The addresses are printed in decimal, but the code is printed in hexadecimal.

If you don't want to waste any of that precious ZX printer paper, then modify the program to print to screen by changing all references to LPRINT to PRINT.

Remember to clear XXXXX, where XXXXX is the ramtop that you wish to set, before loading any machine code. Otherwise the Spectrum will crash.

This program could be converted to the ZX81 simply by rewriting it using one-statement program lines.

Derek Jones

```
[illegible] © Derek Jones 1983

Program Listing

  10 CLS : PRINT AT 0,7; INVERSE
 1;"H E X   P R I N T"
  20 LET V$="0123456789ABCDEF"
  30 PRINT AT 7,0;"Start Address
"
  40 INPUT "Address ? ";a
  50 PRINT AT 7,15;a
  60 PRINT : PRINT "End   Addres
s"
  70 INPUT "Address ? ";b
  80 PRINT AT 9,15;b
  85 INPUT "All O.K. ? ";a$: IF
a$="n" OR a$="N" THEN GO TO 10
  90 IF a$<>"y" AND a$<>"Y" THEN
 GO TO 85
  95 LPRINT : LPRINT : LPRINT "
: LPRINT : LPRINT "ADDRESS
  HEX   CODE          ": LPRINT "
 LPRINT
 100 FOR n=a TO b STEP 8
 110 LPRINT n;TAB 8;
 120 FOR c=0 TO 7
 130 LET d=PEEK (n+c)
 150 LET e=INT (d/16)
 155 LET e$=V$(e+1)
 160 LET d=d-(e*16)
 170 LET f$=V$(d+1)
 180 LET h$=" "+e$+f$
 190 LPRINT h$;
 200 NEXT c
 210 LPRINT
 220 NEXT n
 230 PRINT AT 21,0;"Press ""N""
to stop; ""Y"" to run"
 240 IF INKEY$="y" OR INKEY$="Y"
 THEN GO TO 10
 250 IF INKEY$<>"n" AND INKEY$<>
"N" THEN GO TO 240
```

Sample print of hex code

```
ADDRESS          HEX   CODE

10000     FF 24 DF FE 28 20 0C FD
10008     CB 01 76 20 17 CD 52 2A
10016     E7 16 F0 05 00 4F 21 95
10024     27 CD DC 16 30 06 4E 21
10032     ED 26 09 46 D1 7A B6 38
10040     3A A7 CA 16 00 C5 21 35
10048     5C 7B FE ED 20 06 CB 76
10056     20 02 1E 99 D5 CD 30 25
```

Protected programs Spectrum

To fully protect your program, you need to dabble in machine code. But if this appears formidable, the following routine will give a virtually undeletable program line. Type in your message at Line 1, such as:

1 REM copyright your name

And then enter POKE (PEEK 23635 + 256 * PEEK 23636) + 1,0. In effect this alters the starting address of the program, giving a virtually undeletable line at 0. Try removing this line! Using the direct colour tip above you can use line 0 to blank out the rest of the program. **Tim Boone**

Why not send in your tip, too?

Should you switch on to these BBC games?

It just goes to show that a good micro doesn't guarantee a good game

Wall
B £5.95

Program Power, 8/8A Regent Street, Chapel Allerton, Leeds L57 4PE

One of the many Breakout-type arcade games, and not a particularly outstanding one at that.

One of my criteria is whether it is better than versions published as a listing. This game, although providing plenty of options, is not as good as some I have typed in.

The program loaded first time and in two sections, first instructions (which can be omitted on future loadings), then the game.

Colour, graphics and sound are good, and control keys are efficient. But I found that I soon became bored with it. There isn't even a high score hall of fame feature.

R.E.

instructions	90%
playability	40%
graphics	45%
value for money	30%

★ ★

Bouncer
B £8

A & F, 830 Hyde Road, Manchester M18 7JD

You control a 'circle of antimatter' into which the bouncing aliens, who inhabit this planet, are sucked. But if the vortex you control is slightly off centre then the vortex is itself destroyed.

If you cannot clear the area of bouncing beings before the stars twinkle their last then your time (and game) is gone.

The first two sheets are easy enough, with few and fairly slow bouncers to hoover into your antimatter, but on the third the bouncers bounce off the sky, needing fast thinking and mental geometry unless you are prepared to turn the VDU upside down!

Unfortunately that's it — there are no extra revelations as you move through the game.

D.C.

instructions	50%
playability	40%
graphics	70%
value for money	50%

★ ★ ★

Painter
B £8

A & F, 830 Hyde Road, Manchester M18 7JD

This is one of my top three favourite games without a doubt! A paint roller has to be steered around some 'rooms' in order to colour them in. It ain't that simple, however, as there are Chasers trying to stop you and who destroy your roller if they do.

With only three rollers and with ever-more intricate patterns to paint, life is bad enough — but the chasers actually become more numerous and more 'intelligent' as time goes on. (I'd swear they get faster too but no-one believes me!)

This game has high addictive value. One of my guests played it till 2 am. It's fast, colourful, responsive and has some of the rudest sound effects you've ever heard.

D.C.

instructions	80%
playability	100%
graphics	90%
value for money	100%

★ ★ ★ ★ ★

Cosmic Defender
B £6.50

Soft Joe's Business Centre, Claughton Rd, Birkenhead, Merseyside L41 6ES

I suppose most people know why games are written in machine code, rather than BASIC — BASIC is just too slow for good animation. Well, this game is in BASIC.

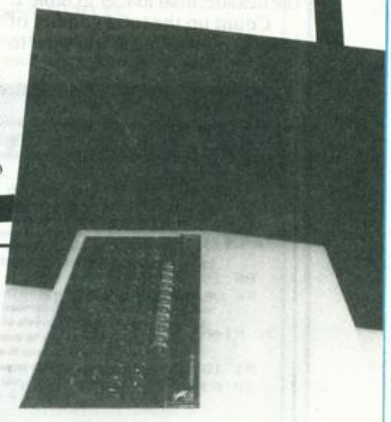
It's a simple shoot/bomb the aliens type, nothing new, unexceptional graphics and one of the worst keyboard control layouts I've seen in ages.

Because BASIC takes so long to move things around on the screen, sometimes your ship seems to ignore movement commands. I can't think of anything about this one to make me recommend that you buy it.

B.J.

instructions	90%
playability	20%
graphics	50%
value for money	10%

★



Swoop
B £6.95

Program Power 8/8A Regent. Street, Chapel Allerton, Leeds LST 4PE

A very limited version of the Galaxians arcade game with only a couple of descending aliens at a time.

However on landing they do not return to the pack but mutate into destructive exploding eggs.

There are eight phases of "sheets" of increased difficulty. Colour and sound is used well, but graphics tend to be "chunky".

The keys are responsive and easy to use.

A disappointing game — I have other versions which are far superior (and which cost more!).

R.E.

instructions	90%
playability	60%
graphics	55%
value for money	57%

★ ★ ★

Make fast work of SCROLLing with your ZX81

Speed up your programs with a touch of machine code. It's not as daunting as it seems if you follow David Nowotnik's advice. You'll need at least 4K of RAM

Fast moving graphics on all microcomputers often depend on routines written in machine code.

This is particularly important on the ZX81 where the operating speed of BASIC is much slower compared with other micros.

But the prospect of writing machine code can be quite daunting to relative beginners to computing. Fortunately, it usually is not necessary to write a whole program in machine code, just the parts that need high speed.

From a library of short machine code routines you could build up a fast moving game. To start you off in the right direction, this article will show you how to build up routines on the ZX81, with four short machine code routines as examples.

The command SCROLL is provided on the ZX81; its function is to move every screen character up one square. You could also scroll downwards, or left, or right, and the routines 1, 2, and 3 in **table 1** do just that.

The fourth routine inverts the screen, that is, it converts black to white and white to black in every screen position. Please note that all four routines will only work when the computer has access to more than 4K of RAM.

The easiest method of storing machine code on the ZX81 is in a REM line, this line being the first line of the program.

The numbers in table 1 are in hexadecimal (base 16); each pair of digits represents a number between 0 and 255 in decimal, and requires one byte of RAM for storage. You can enter these machine code hex numbers using the hexadecimal loader in **table 2.**

Count up the total number of bytes in the routine(s) you want to use. This is the number of bytes (characters) you will need in line 1 in table 2. Type in one full stop for every byte you need, then add a few extra for safety.

When you RUN this program, type in the hex numbers in table 1, one pair of digits for each INPUT prompt, and S to stop. Make sure you enter the numbers in the right order.

One routine may follow immediately after another provided that you have made enough space available. Just enter the routines you want for your particular application.

Before you use the machine code routines, you should check that all numbers have been entered correctly.

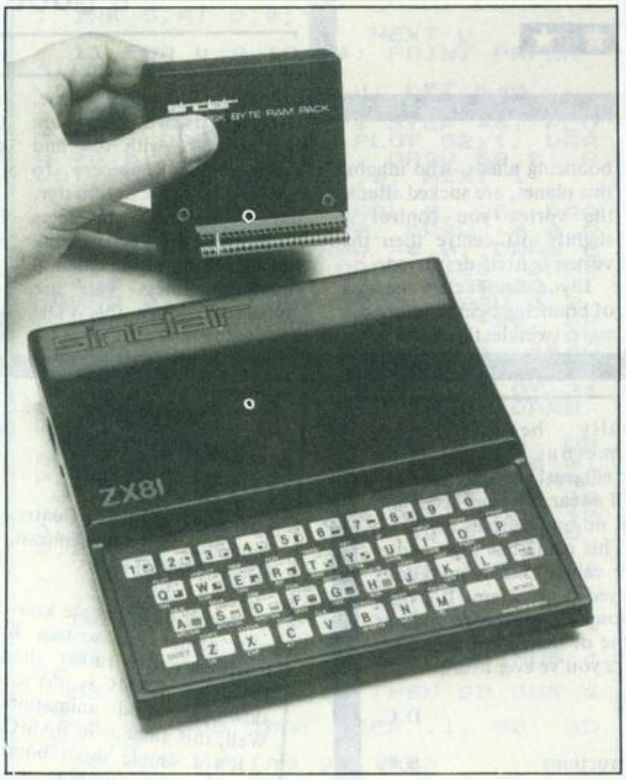


Table 1 — machine code hexadecimal listing

```
1. Reverse SCROLL

  01 18 03 2A 0C 40 09 EB 01 F7 02 2A 0C 40 09 ED B8
  1B 06 20 3E 00 12 1B 10 FC C9

2. Left SCROLL

  06 18 2A 0C 40 54 5D 23 23 13 7E FE 76 28 03 12 18
  F6 3E 00 12 23 13 10 EF C9

3. Right SCROLL

  01 18 03 2A 0C 40 09 54 5D 06 18 2B 2B 1B 7E FE 76
  28 03 12 18 F6 3E 00 12 2B 1B 10 EF C9


4. Invert Routine

  2A 0C 40 06 18 C5 06 20 23 7E C6 80 77 10 F9 23 C1
  10 F2 C9
```

A number of readers reported problems in trying to use the routine in my last article on ZX81 machine code (HCW No. 17). This may be due to the incorrect entry of numbers, so they may care to use this check routine as well. First, delete lines 2 to 8 of the hex loader routine, then add the lines in **table 3.** Now RUN.

The routine prints on the screen the storage position (address) and the value held at that address in hex. Check the value, then press a key to move onto the next address.

Press BREAK once you have checked the entire routine. If found you have made one or more mistakes, make a note of the addresses and the correct byte values.

Following BREAK you can correct the value by using POKE as a direct command to place the correct value into the appropriate address. Before using POKE, you will have to convert the hex value into decimal; this you can do using the tables at the back of the ZX81 handbook.

You should also use this routine to note the start addresses of all routines. If you have only one routine (or the first in your series of routines), it will start at address 16514.

You can identify the start of the second and subsequent routines as the address which **follows** a byte value of C9 (hex).

C9 is the Z80 machine code instruction for RETurn; a machine code routine is similar to a subroutine in BASIC, and you return from the routine in much the same way. You will need to know the start addresses when you call the routines from BASIC with the USR function.

Note that not all machine code routines will start at their first address and end at their last; it just so happens that these do.

Once you have checked your routines, and noted all the start addresses, delete lines 2 to 10, and enter the program lines in **table 4.** This is a very simple program to fill the screen with text. SAVE it before you try any machine code routines.

You can get the machine code to work by using direct commands RAND USR x, where x is the start address of the machine code routine. Alternatively, the RAND USR x command can be entered as a program line.

Why not try some? Used inside FOR — NEXT loops, SCROLLing left, right, or down

can be an attractive way of clearing the screen. And invert insider or FOR —NEXT loop produces an effective simulation of an explosion.

As a final note to readers who experienced some problems in my READ/DATA article in HCW No. 17, I have reproduced **table 5.** To obtain a demonstration of the OUT OF DATA ERROR message, change the first number in line 170 to 6, and add a final line: 180 PAUSE 200.

Table 2 — hex loader

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

Table 3 — byte value check routine

```
 2 LET X=16514
 3 LET Y=PEEK X
 4 LET Z=INT(Y/16)
 5 LET Z1=Y-16*Z
 6 SCROLL
 7 PRINT X,CHR$(Z+28);CHR$(Z1+28)
 8 IF INKEY$=""THEN GOTO 8
 9 LET X=X+1
10 GOTO 3
```

Table 4 — demonstration routine

```
10 FOR I=1 TO 10
20 PRINT"ANYTHING ON THE SCREEN"
30 PRINT
40 NEXTI
```

Table 5 — an example of READ/DATA

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

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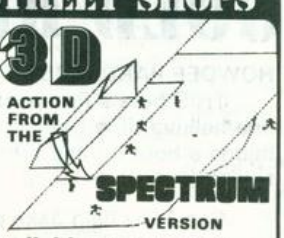

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SINCLAIR USER FEBRUARY 1983

Although I'm no great football fan, I really enjoyed playing this game — excellent use is made of colour and user-defined graphics. The game is very logically put together, so that the development of strategy and tactics has a real effect. For example, one of my teams got through to the fourth round of the F.A. Cup where it was beaten by a second division side. This upset morale and meant that our promotion bid failed. Perhaps I should have given up the F.A. Cup run and held some good players back — the possibilities are endless. Brian Clough had better watch out!

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5-Alike 48K Oric-1 £4.95

Pasesoft, 213-215 Market Street, Hyde, Cheshire SK1 1HF

This is a game that you may have heard of as Yahtzi, although it is simply a variation of poker dice.

Up to six players take it in turns to roll five dice. Each player can then reroll any of the dice, the object being to make up one of a number of different combinations, such as Pontoon, where the dice add up to 21, a four or five dice run, or three, four or five of a kind etc.

You have 13 turns and after each turn you must allocate his score to one of the 13 different categories to score points.

As a newcomer to this type of game I was pleased to see a wealth of examples in the instructions, and I found the game to be both compelling and interesting. I would recommend it to anyone looking for a break from frantic keyboard-bashing.

The graphics (consisting of five disc faces) are colourful and attractive and it's nice to hear some alternative sounds to preprogrammed zaps and pings. I suspect that I shall keep coming back to this one for quite a while.

G.P.

instructions	80%
playability	70%
graphics	65%
value for money	75%

★ ★ ★ ★

Darts BBC B £8.50

Rainbow Research, 288 High Street, Enfield EN3 4HF

My first niggle about this program surfaced while reading the on-screen instructions. Why, when the BBC has cursor control keys, direct the target crosswires with keys 1,2,3 and 4?

The drawing of the dart board was very slow and could do with speeding up, either by using better BASIC techniques or putting this section in machine code.

Once drawn, the target crosswires start to wander around and are repositioned by using the aformentioned control keys.

When you judge you're on target, not always easy as the crosswires tend to merge with the board on a colour TV, you fire your dart by hitting key 5.

The flight of the dart is again very ponderous and may drift off target slightly. On arrival your score is added to the running total until the third dart, when the whole lot is deducted from the total and player two has his go.

The game soon loses its appeal mainly due to the slow speed and lack of good sound effects. **J.H.**

instructions	80%
playability	30%
graphics	30%
value for money	20%

★ ★

Blackjack 19K Jupiter Ace £6.50

JRS, 15 Wayside Avenue, Worthing, Sussex BN13 3JU

An effective implementation of the classic game also known as pontoon, twenty-one and even on occasion, vingt-et-un: this is the one Tandy have been giving away free with every TRS80 for ages now and this version is almost as good.

Using a notional four packs of cards, the computer plays banker for one to four players, gives each a (theoretical) twenty pounds, plays ten hands and then cashes up. The winner is of course the richest.

The game keeps track of the cash for each player, and deals out tolerable if somewhat small graphic presentations of the playing cards.

The instructions could be somewhat bewildering to the novice for neither on the cassette card nor on the screen are the rules clearly set out. It wouldn't have cost much to print them on the card, given the very adequate profit margins on games software, and it is something the customer has a right to expect.

For those new to it, it should make a welcome change from ghosts in mazes and with all the practice the computer can give could even prove profitable in those holiday casinos on the Costa Paquet!

G.M.

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

★ ★ ★ ★ ★

Dominoes Spectrum £4.95

Micromega, 230-236 Lavender Hill, London SW11 1LE

This program gives little incentive to leave T'Rovers and go home to your Spectrum. It is a competent version of the classic pub game, but sadly lacks the welcome chink of glasses and other atmospherics.

The author had remembered that domino novices still exist and good instructions are included on the easy-loading cassette. "Wait a moment" ordered the computer and 30 seconds later I was sat in front of 13 dominoes, dealt by my opponent, the Spectrum, who duly promised to forget them!

Specifying which dominoes I wanted to play was easy, but telling the computer where to place them was another matter — for reasons best known to himself the author has done away with the familiar right-angled shapes produced during a game and invented an unnecessarily complicated system of his own.

This detracted from the playability of a game whose very subject matter is not the most exciting. Nevertheless the Spectrum is a good opponent and the score is currently 4-2 in its favour. **T.B.**

instructions	70%
playability	40%
graphics	30%
value for money	40%

★ ★ ★

Bandit Dragon 32 £6,50

Soft Joe's £6.50, Business Centre, Claughton Rd, Birkenhead, Merseyside

A rather nice simulation of a fruit machine, Bandit includes holds, nudges a gamble feature and has large colourful symbols.

Excellent instructions explain how to play and give payout rates.

A jackpot of 500 credits for three Dragon Bars is a very rare event and your 250 credits with which you start soon disappears.

But not having full sound effects the symbols are displayed much faster and you are not driven mad by the beeps.

This is a very addictive game which you can play for hourse without needing a stack of 10p pieces.

D.W.

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

★ ★ ★ ★ ★

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To reach your seed-box and plant the seeds you must clear the slugs from each level by dropping slug pellets, using the space bar.

To reverse direction use the R key, but remember that the effort will reduce your oxygen reserve. Do not run out of pellets or descend a ladder before the slugs are killed or they will get their revenge.

Main variables

R row of man on screen
C column of man on screen
CE erase column of man
RE erase row of man
X define direction of man
SP quantity of slug pellets
SG number of slugs
L oxygen level

How it works

150-340 define characters and colours
350-420 input and check number of slug pellets
430-570 set up screen graphics
580-640 set initial variables and man's position
660-1200 set man moving, detect key presses and hits on slugs, descend ladders
1220-1760 lose and win routines, request another game
1780-1810 subroutine to clear screen

```
100 REM  SLUGS AND LADDERS
110 REM
120 REM     BY B.BALDWIN
130 REM     DEF GRAPHICS
140 CALL CLEAR
150 CALL CHAR(104,"00000000FFFFFFFF")
160 CALL CHAR(100,"00000008C9C9FFFF")
170 CALL CHAR(96,"1C1C08FEDD1C1436")
180 CALL CHAR(136,"FFFFFFFF")
190 CALL CHAR(120,"000000383838")
200 CALL CHAR(128,"AA55AA55AA55AA55")
210 CALL CHAR(97,"9D9D89FF9D9D95B7")
220 CALL CHAR(99,"FFFFFFFFFFFFFFFF")
230 CALL CHAR(98,"81FF81FF81FF81FF")
240 CALL CHAR(144,"00FFFFFFFFFFFF00")
250 CALL CHAR(152,"10925438FE385492")
260 CALL CHAR(105,"10101092D6D67C38")
270 CALL COLOR(14,10,11)
280 CALL COLOR(16,14,11)
290 CALL COLOR(10,13,11)
300 CALL COLOR(9,2,11)
310 CALL COLOR(12,5,11)
320 CALL COLOR(13,9,12)
330 CALL COLOR(9,2,11)
340 CALL COLOR(15,2,16)
350 PRINT "   HOW MANY SLUG PELLETS?"::
360 INPUT "       (20 TO 40) ":SP
370 IF (SP<20)+(SP>40)THEN 360
```

Hints on conversion

Texas BASIC has some unusual commands for graphics and sound:

CALL CHAR (number, hexadecimal string) controls the user definition of characters. Number refers to the ASCII code of the re-defined character.

CALL HCHAR (row, column, number) prints the character whose ASCII code is number at position row, column on the screen. The T199/4A has a screen size of 24 rows by 32 columns.

CALL GCHAR (row, column, variable) is the equivalent of PEEK. The ASCII code of the character at position row, column on the screen is left in the designated variable.

CALL SOUND (d, f, v) sounds a note of frequency f, duration d milli-seconds and volume v.

CALL KEY (O, K, S), the equivalent of INKEYS, will leave the ASCII code of the key pressed in the variable K.

CALL CLEAR clears the screen. A direct equivalent of CLS.

```
380 REM   SET SCREEN
390 CALL CLEAR
400 CALL SCREEN(2)
410 CALL COLOR(1,11,11)
420 RANDOMIZE
430 FOR I=4 TO 24 STEP 5
440 CALL HCHAR(I,1,144,32)
450 NEXT I
460 CALL VCHAR(1,3,98,24)
470 CALL VCHAR(1,32,99,24)
480 CALL HCHAR(23,30,128)
490 CALL HCHAR(1,4,136,27)
500 FOR I=8 TO 23 STEP 5
510 FOR J=1 TO 5
520 SC=INT(27*RND)+4
530 CALL GCHAR(I,SC,SS)
540 IF SS<>32 THEN 520
550 CALL HCHAR(I,SC,104)
560 NEXT J
570 NEXT I
580 X=1
590 L=32
600 RE=1
610 CE=1
620 SG=5
630 R=3
```

```
640 C=4
650 REM   START GAME
660 CALL HCHAR(R,C,96)
670 IF SP=0 THEN 1320
680 CALL KEY(0,K,S)
690 RE=R
700 CE=C
710 IF S<>0 THEN 940
720 C=C+X
730 IF C>30 THEN 770
740 IF C=3 THEN 810
750 CALL HCHAR(RE,CE,32)
760 GOTO 660
770 CALL HCHAR(RE,CE,32)
780 IF (C=31)*(R=23)THEN 1420
790 C=31
800 GOTO 660
810 CALL HCHAR(RE,CE,32)
820 FOR I=R+1 TO R+5
830 CALL HCHAR(I,C,97)
840 CALL SOUND(100,200,1)
850 CALL HCHAR(I,C,98)
860 NEXT I
870 R=R+5
880 CALL HCHAR(R,3,98)
```

```
890 X=1
900 IF SG>0 THEN 1230
910 SG=5
920 GOTO 640
930 REM   DETECT KEYS
940 IF K<>82 THEN 1010
950 L=L-1
960 IF L=3 THEN 1710
970 CALL HCHAR(1,L,32)
980 X=-X
990 CALL SOUND(20,1600,5)
1000 GOTO 720
1010 IF K<>32 THEN 720
1020 SP=SP-1
1030 FOR I=R+2 TO R+5
1040 CALL GCHAR(I,C,HS)
1050 CALL HCHAR(I,C,120)
1060 CALL SOUND(20,400,1)
1070 CALL HCHAR(I,C,32)
1080 NEXT I
1090 IF HS<>128 THEN 1110
1100 CALL HCHAR(23,30,128)
1110 IF HS<>104 THEN 720
1120 REM   HIT SLUG
1130 CALL HCHAR(R+5,C,104)
1140 CALL COLOR(10,14,11)
```

TI-99/4A PROGRAM

```
1150 SG=SG-1
1160 FOR I=5 TO 0 STEP -1
1170 CALL SOUND(100,-6,I)
1180 NEXT I
1190 CALL HCHAR(R+5,C,32)
1200 CALL COLOR(10,13,11)
1210 GOTO 720
1220 REM   LOSE ROUTINES
1230 CALL HCHAR(R,4,96)
1240 FOR I=16 TO 1 STEP -1
1250 CALL HCHAR(R,I+3,104)
1260 CALL SOUND(100,-6,I)
1270 NEXT I
1280 GOSUB 1780
1290 PRINT "  THE SLUGS SLAUGHTERED YOU":::
1300 GOTO 1670
1310 END
1320 FOR I=4 TO 31
1330 CALL COLOR(10,14,11)
1340 CALL HCHAR(R,I,104)
1350 CALL SOUND(50,-6,1)
1360 CALL COLOR(10,13,11)
1370 NEXT I
1380 GOSUB 1780
1390 PRINT "   YOU RAN OUT OF PELLETS":::
1400 GOTO 1290
1410 REM   WIN ROUTINE
1420 FOR I=30 TO 3 STEP -2
1430 CALL HCHAR(R,I,96)
1440 CALL SOUND(10,800,2)
1450 CALL HCHAR(R,I,32)
1460 NEXT I
1470 FOR I=23 TO 3 STEP -2
1480 CALL HCHAR(I,3,97)
1490 CALL SOUND(50,200,2)
1500 CALL HCHAR(I,3,98)
1510 NEXT I
1520 CALL HCHAR(3,2,96)
1530 FOR I=28 TO 5 STEP -4
1540 CALL HCHAR(23,I,105)
1550 CALL SOUND(20,1600,2)
1560 NEXT I
1570 FOR I=28 TO 5 STEP -4
1580 CALL HCHAR(22,I,152)
1590 CALL SOUND(20,1600,2)
1600 NEXT I
1610 CALL SOUND(100,294,1,440,1,370,1)
1620 CALL SOUND(1000,294,1,440,1,370,1)
1630 FOR I=1 TO 500
1640 NEXT I
1650 GOSUB 1780
1660 PRINT TAB(10);"WELL DONE":::
1670 PRINT TAB(6);"ANOTHER GAME? (Y/N)":::
1680 CALL KEY(0,K,S)
1690 IF S=0 THEN 1680
1700 IF K=89 THEN 350 ELSE 1310
1710 CALL HCHAR(R,C,100)
1720 FOR I=1 TO 500
1730 NEXT I
1740 GOSUB 1780
1750 REM   LOSE AGAIN
1760 PRINT "     YOU RAN OUT OF OXYGEN":::
1770 GOTO 1670
1780 CALL COLOR(1,4,4)
1790 CALL SCREEN(4)
1800 CALL CLEAR
1810 RETURN
```


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Space Defence occupies 12K, so it will run on both models of the Oric.

Your controls:

1 down
2 up
9 fire

Hints on conversion

PLOT may be used as ? AT or can, with some alteration, be POKEd on the screen. Instead of SCRN, PEEK commands can be used.

INKEY$ may be used instead of KEY$ and WAIT could be replaced by PAUSE.

The Oric sound commands, ZAP, PIG, EXPLODE and SHOOT, would have to be replaced with whatever your machine offers.

Those aliens never learn. They're out to conquer Earth again, and your mission is to stop them. Kevin Wilson and Peter Slatter wrote Space Defence for both models of the Oric

How it works

1-15 clear screen, print Space Defence 16 times on assortment of coloured backgrounds
16-24 instructions
27-32 select level, check for silly variables
800-810 initialise variables
900-950 plot alien craft and your craft, checks for collision
960-1000 move your craft and fire
1010-1020 ensures you don't move off screen
1030-1060 plot alien craft clear
1070-2000 check for alien ships landed
2030-2031 after measured period print score, add possible 200-point bonus, speeds up movement of alien ships
8000-9000 if high score asks your name, option to replay
10000-11050 plot bullets, checks for hit — and if so which one — pushes alien back, increments score by 10

Variables

S score
Z, Y, X, W, co-ordinate of alien craft
A, Y, co-ordinate of your ship

```
1 REM *SPACE  DEFENCE*
2 REM *BY K.WILSON & P.SLATTER*
3 CLS:PAPER6:INK0
4 PRINT:PRINT:PRINT:PRINT:PRINT:FORS=1 TO 16
5 PRINTCHR$(140)"     S P A C E   D E F E N C E "
6 WAIT 30:NEXTS
7 FOR V=1TO5
8 INK0:WAIT50
9 FOR D=1TO7
10 PAPERD
11 WAIT 50
12 NEXT D
14 NEXT V
15 INK0:PAPER2:CLS
16 PRINTCHR$(140)SPC(6)"I N S T R U C T I O N S ":WAIT40
17 PRINT:PRINT  "FOUR ALIEN SHIPS ADVANCE TOWARDS YOU."
18 PRINT:PRINT  "YOU HAVE TO PUSH THEM BACK BY SHOOTING THEM."
19 PRINT:PRINT"IF THEY REACH YOUR SIDE OF THE SCREEN,THE GAME IS AU
TOMATICALLY OVER."
20 PRINT:PRINT  "SOUND'S EASY eh!"
21 PRINT:PRINT  "THEY WILL GRADUALLY SPEED UP AS TIME  PROGRESSES."

22 PRINT:PRINT:PRINTCHR$(140)CHR$(132)SPC(10)"1-DOWN"
23 PRINT:PRINT:PRINTCHR$(140)CHR$(129)SPC(10)"2-UP"
24 PRINT:PRINT:PRINTCHR$(140)SPC(11)"9-FIRE":WAIT1500:CLS
27 PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRIN
T:INPUT"LEVEL=1-EASY,2-AVERAGE,3-PRO";U:CLS
28 IF U<1 THEN U=1
29 IF U>3 THEN U=3
30 IF U=1THENP=.1
31 IF U=2THENP=.2
32 IF U=3THENP=.4
33 S=0
800 Z=3:Y=3:X=3:W=3:T=3:A=15
801 HS=HS
810 Z=3:A=15:W=3:X=3:Y=3
900 HS=HS:FOR D=1 TO150
910 PLOTZ,2,"(+)"
920 PLOTX,8,"(+)"
930 PLOTY,16,"(+)"
940 PLOTW,20,"(+)"
941 IFSCRN(35,A)=125THENGOTO7990
950 PLOT35,A,"-=)"
960 R$=KEY$
970 PLOT35,A,"   "
980 IFR$="1"THENA=A+1
990 IFR$="2"THENA=A-1
992 PLOT 35,A,"-=)"
1000 IFR$="9"THENGOTO10000
1010 IFA<0THENA=0
1020 IFA>26THENA=26
1030 PLOTZ,2,"   "
1040 PLOTX,8,"   "
```

```
1050 PLOTY,16,"   "
1060 PLOTW,20,"   "
1070 IFZ>35THENGOTO8050
1080 IFX>35THENGOTO8050
1090 IFY>35THENGOTO8050
2000 IFW>35THENGOTO8050
2010 Z=Z+P:X=X+P:Y=Y+P:W=W+P
2011 PLOT35,A,"-=)"
2020 NEXT D
2030 P=P+.05:PRINT"WAVE COMPLETE,GETTING FASTER":S=S+200:WAIT300
2031 PRINT:PRINT  " YOUR SCORE SO FAR=";S:WAIT150
2040 :WAIT200:CLS:GOTO810
7990 CLS
8000 PRINT:PRINT:PRINT"YOUR SCORE";S:EXPLODE:GOTO9001:CLS
8001 CLS
8050 FOR K=1TO25
8060 PAPER2:EXPLODE
8070 PAPER1
8075 NEXT K
8080 CLS
9000 PRINT"THEY LANDED YOUR SCORE=";S
9001 IF S>HSTHEN INPUT"ENTER NAME";D$
9002 IF S>HS THEN HS=S
9003 PRINT"HIGH SCORE=";HS;"   BY   ";D$
9004 PRINT" ANOTHER GO (Y/N)"
9005 INPUT B$
9006 IF B$="Y" THEN CLS:GOTO27
9007 PRINT"GOOD BYE "
9008 END
10000 ZAP:FOR Q=1TO25
10001 PLOT35,A,"-=)"
10010 IFSCRN(35-Q,A)=125THENEXPLODE:GOTO11000
10020 PLOT35-Q,A,"-":PLOT35-Q,A," "
10030 NEXT Q
10040 GOTO1010
11000 S=S+10
11010 IFA=2THENPLOT35-Q-2,A,"   ":Z=1
11020 IFA=8THENPLOT35-Q-2,A,"   ":X=1
11030 IFA=16THENPLOT35-Q-2,A,"   ":Y=1
11040 IFA=20THENPLOT35-Q-2,A,"   ":W=1
11050 GOTO10040
```

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Hidden City 48K £5.95

Bytewell, 203 Court Road, Barry, South Glamorgan CF6 7EW

Can you free your planet from entrenched alien forces who have built cities underground?

First dive from outer space to the underground space tunnel at bottom right. Your three shields won't last long unless you are quick, even at the lowest of six skill levels.

Dive into the alien fuel dump maze, fill up and on into the subterranean tunnel. Peculiarly, you can gain points from 'active' space mines while the 'inactive' dispose of you (as do tunnel walls, floor or defence stations).

At last you come to the alien city. One shot into the hearts of the reactor returns you a hero of your people.

Colour and sound are well used but not spectacular. There are one or two rough edges — some jerkiness of movement and at times control is not very responsive.

P.C.

instructions	70%
playability	85%
graphics	80%
value for money	75%

★ ★ ★

Zzoom 48K £5.50

Imagine, Masons Buildings, Exchange Street East, Liverpool L2 3PN

Fight off enemy planes and tanks to allow the refugees to escape. Similar in concept to many battle/space games but with outstanding graphics and good sound, this game really is exciting. The realism generated by 3D effecs of swooping, diving, bombing, attacking planes and the little men running and shaking their fists at the attackers is superb.

There are options to use the most popular Joysticks (Kempston etc) or keyboard. The keyboard option allows a choice of several different key combinations.

Without doubt the best combat game, so far, that I have played on the Spectrum — I even bought a joystick specifically to play it. **R.E.**

playability	100%
playability	100%
graphics	100%
value for money	100%

★ ★ ★ ★

Violent Universe £5.50

Quest, 119 The Promenade, Cheltenham, Glos

This is a fast, colourful game, making excellent use of the Spectrum's graphics and sound.

Your space craft (same as in Black Hole) moves around the screen, leaving behind it up to six gas clouds to destroy the suicidal anti-matter alien craft which are out to get your convoy of spaceships.

The keys are responsive and easy to use, but there is a joystick option, and using one makes the game easier to play.

Instructions are given on screen and insert, though I could have done with a chart explaining which were friendly and which were alien craft; telling them apart only comes with practice.

My solution was to simply destroy everything in sight.

An addictive game, with an increasing difficulty level to keep your interest. **R.E.**

instructions	76%
playability	94%
graphics	98%
value for money	92%

★ ★ ★ ★ ★

Cosmos £5.95

Abbex, 20 Ashley Court, London NW4

In Cosmos you use your starship to defend mine cargo vessels from alien ships, warp mines and asteroids. To help you, you have two lasers and an on-board computer which gives you various status reports.

Your objective, as you patrol nine possible sectors of space, is to shoot the aliens and asteroids as you scroll them into your laser gunsight, located in the middle of your window on space. Your stock of cargo ships diminishes as they get hit by either aliens or asteroids.

Instead of fumbling for single keys, the whole keyboard is divided into sectors, and any one of five keys in the given sector will work.

This program is well written and has good graphics. The only thing lacking is sound. The struggle to save the universe carries on without a single whisper.

M.B.

instructions	95%
playability	85%
graphics	85%
value for money	80%

★ ★ ★ ★ ★

Trog 48K £4.95

Macronics, 26 Spiers Close, Knowle, Solihull B93 9ES

You're the sole survivor of the star-fleet, lost in the far reaches of the Galaxy. In your lust for revenge you must contend with alien ships and rogue meteors.

You manoeuvre up and down to avoid collisions and to blast your way to a huge points tally. In tight spots you can evade destruction by entering hyperspace.

Your precious fuel is replenished when you destroy a Scapian (who?) ship. But be careful, they hover tantalizingly out of range.

The game's instructions are clear and concise, but note the spelling errors! The game is easy to play thanks to the well allocated control keys, or you can use a joystick.

Be careful not press CAPS SHIFT and BREAK together at the end of a game.

Imaginative use of colour and graphics combine to produce an effective screen display.

C.C.

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

★ ★ ★ ★ ★

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SUMLOCK MICROWARE

198 Deansgate, Manchester, M3 3NE. Dept. HCS1.

Why wait? Here's how to find that program . . . fast

We all know how long it takes for the computer to find a program on a long tape, even using the tape counter. Mike Roberts shows how to do it the easy way on the unexpanded VIC-20

How it works
10-100 introduction
120 define constants
130 set up screen, display tape name
140 display directory contents
150-160 get and check required program
170-210 turn tape deck off and wait for f/fwd to be pressed
220-250 wait for the right sector, then turn off tape
260-280 wait for stop/eject button to be pressed
290-310 end message, restore system to normal
500 tape catalog name
510 number of sectors on tape
520-610 program names — must be padded out to 16 characters

Variables
CS clear screen
RS reverse field
QS quotation marks
A$ temporary variable for reAd
X number of sectors to tape
I loop variable
A required progrAm number
37148 POKE location for turning tape on and off
37151 PEEK location to check if tape key is down
TI$ TIme variable
B counter for wait
TI TIme counter

This tape cataloguing system will allow you to find and LOAD/SAVE programs on a tape quickly.

It does this by keeping a record (directory or catalogue) of all the programs on the tape and, by using the fast forward function of the tape deck, gets to the right place on the tape fast.

The catalogue program must be recorded at the beginning of a blank tape. It is currently set up for a C60 cassette, allowing 10 programs of about 8K on each side. But this can be changed.

The longest it will take to find a program is about 1 minute 40 seconds, and this is reduced to nothing at all at the beginning of the tape.

The name of the tape, how many programs are on the tape, and their names are all at the end of the program in DATA statements, so they can be easily changed.

The program names are in quotes with 16 characters. This is because future names must be allowed for so when an amendment is made and the catalogue reSAVED it will not record over the next program on the tape.

As the 10 sectors are all of a fixed length, a program may be overwritten without fear of destroying the program after it — as long as the 8K maximum is kept to. And, if this program is used as a part of a much larger file handler, a kind of random access is possible.

Overall this program tries to make the most of a tape drive and brings it to floppy tape level of access time.

This is only possible because the Commodore tape drive is directly computer controlled and, as such, a lot more can be done with it than with more conventional computers. When this is coupled with the 100 per cent reliability, it more than makes up for the extra cost.

When first started off the tape name and the names of all the programs on the tape are displayed with their sector numbers. You are then invited to select one of the numbers.

Then you must press the fast/forward key on the tape deck. Nothing will happen to the tape deck at this point. Press the keyboard key to signify completion and the tape will start fast forwarding. After a delay the tape will stop and you must press the stop/eject key. Then the program will stop and invite you to LOAD or SAVE a program on tape at that point.

As this program is run whenever a program is needed it can have possibilities for utility software and POKES etc incorporated in it, i.e. POKE650,129 which will make all the keys repeat on the keyboard, or colour POKES and other things that need be run at the beginning of a session.

If all REMS are left out the program will run on a standard 3.5K VIC-20 with Commodore cassette drive.

```
100 :
120 CS=CHR$(147):RS=CHR$(18):QS=CHR$(34):REM** SET UP CURSOR CONTROLS **
130 PRINTCS;RS;QS;:READ#1;PRINT#3;QS:REM** START UP MESSAGE **
140 PRINT:READ#1,FOR I=1TOX:READ#1,PRINT" "A$:NEXT:REM PRINT DIRECTORY CONTENTS
150 PRINT:PRINT"WHICH PROGRAM ?":PRINT"ENTER A NUMBER BETWEEN 1 AND";X:INPUTA
151 REM** WHAT PROGRAM ? **
160 IFA<1ORA>XTHEN150:REM** CHECK BETWEEN LIMITS **
170 POKE37148,6:REM** TURN CASSETTE OFF **
180 PRINTC$;"  PRESS FAST FORWARD  BUTTON DOWN THEN PRESSANY KEY"
190 POKE198,0
200 IFPEEK(198)=0THEN200:REM** WAIT FOR KEY TO BE PRESSED **
210 IFPEEK(37151)AND64THEN180:REM** CHECK TO SEE IF F/FWD HAS BEEN DEPRESSED **
220 PRINT:PRINT" PLEASE WAIT FOR THE  PROGRAM TO BE FOUND"
230 POKE37148,14:TI$="000000":B=(A-1)*10:REM** TURN THE TAPE BACK ON **
240 IFTI/60<BTHEN240:REM** WAIT A#10 SECONDS **
250 POKE37148,6:REM** TURN OFF TAPE **
260 PRINT:PRINT"PRESS THE STOP/EJECT  BUTTON ON THE CASETTE"
270 IFPEEK(37151)AND64THEN290
280 GOTO270:REM** WAIT FOR STOP/EJECT **
290 PRINT:PRINT"YOU ARE NOW READY TO":PRINT:PRINT"LOAD"Q$:RESTORE:FORI=1TOA+2:
READ#1:NEXT
300 PRINT:PRINT:POKE37148,14:REM** END MESSAGE AND TURN TAPE BACK ON **
310 POKE198,0:REM** KILL KEYBOARD BUFFER **
500 DATA TAPE NAME
505 REM** ↑ NAME THAT THE TAPE CATALOG HAS **
510 DATA 10
515 REM** ↑ NUMBER OF PROGRAMS ON THE TAPE **
517 REM** MUST BE MATCHED BY NUMBER OF DATA STATMENTS **
520 DATA "PROGRAM 1       "
530 DATA "PROGRAM 2       "
540 DATA "PROGRAM 3       "
550 DATA "PROGRAM 4       "
560 DATA "PROGRAM 5       "
570 DATA "PROGRAM 6       "
580 DATA "PROGRAM 7       "
590 DATA "PROGRAM 8       "
600 DATA "PROGRAM 9       "
610 DATA "PROGRAM 10      "
620 REM** EXAMPLE NAMES ARE 16 CHARACTERS LONG **
READY.
```

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Alternative: Piccadilly Line (from Heathrow etc) to Finsbury Park or Wood Green — Link with W3 bus service to the fair.

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New Generation Software

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Top Ten programs for the VIC-20

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

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

Top Ten programs for the ZX81

1	Scramble	Quicksilva (3)
2	Football Manager	Addictive (1)
3	Defender	Quicksilva (8)
4	Flight Simulation	Sinclair (2)
5	1K Chess	Sinclair (4)
6	1K Games	Sinclair (6)
7	Fantasy Games	Sinclair (5)
8	Invaders	Quicksilva (–)
9	Espionage Island	Sinclair (10)
10	Invaders	Bug Byte (–)

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

Top Ten programs for the Spectrum

1	Jet Pac	Ultimate (1)
2	Transylvanian Tower	Richard Shepherd (3)
3	Flight Simulation	Psion (2)
4	Horace Goes Skiing	Psion/M. House (4)
5	Horace and the Spiders	Psion/M. House (6)
6	Monsters in Hell	Softek (7)
7	Penetrator	Melbourne House (10)
8	Pssst	Ultimate (–)
9	3D Tanx	dk'tronics (5)
10	Mad Martha	Microgen (–)

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

Top Ten programs for the Dragon-32

1	Mountain	Dragon (–)
2	Basic Tutorial	Ampalsoft (–)
3	Personal Finance	Dragon (–)
4	Special Collection 1	Dragon (–)
5	The King	Microdeal (1)
6	Android Attack	Microdeal (3)
7	Planet Invasion	Microdeal (4)
8	Space War	Microdeal (2)
9	Nightflight	Salamander (5)
10	Dragon Trek	Wintersoft (6)

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

A human face for micros

This week I received a complementary copy of a magazine called Micro Discovery in the post. After having my fill of so-called new and revolutionary computing magazines, I have to say that this one appears to live up to its promise.

All too often, magazines try to be all things to all people, and end up being nothing to anyone. In no other trade is this more true than in personal computing. It seems that all too often most articles I read are either too machine-dependent or not machine-dependent enough. Alternatively, they might be too general or too specific. Not so with Micro Discovery. The emphasis is on people involved with computing rather than being hardware oriented, software oriented, or anything-else oriented. I find this approach meaningful and rewarding.

The magazine calls itself the non-technical magazine of personal computing, which is a very appropriate sub-title. As the publisher is quick to state in the introduction, this magazine addresses the human side of micros. There are examples of humor, poetry(!), stories, and articles full of information throughout the pages of the first issue. One feature alone is enough to make me a devoted reader — each issue includes a glossary of special terms. Isn't that a human touch? How many times have all of us reading an interesting technical article only to be stopped cold by a term, phrase, or work we didn't understand? It used to happen to me all the time before I became a foreign correspondent (a little humor there).

Among the interesting articles in the first issue are these: Poems, by Ray Bradbury (fiction writer of note), an interview of Grace Hopper (often called the mother of computing, or perhaps the grandmother), and an essay on the need for instructions in plain English (amen). Additionally there are columns on new hardware and software, and a regular column called The Computer Generation dealing with the many benefits that children can obtain from micros. Let me heartily recommend this magazine to all you computer-using human beings out there. Write to Micro Discovery, 5152 Katella Avenue, Suite 102, Los Alamitos, CA 90720. One year subscription in the U.S. is $24; no foreign listing was provided.

★★★★

It looks like Commodore has licked its largest enemy to sales in this country (its own marketing organization). In the first quarter of this year, the firm has announced earnings up 130% from the same time frame last year. The increased income is attributed to increased demand primarily for the 64 and VIC-20 computers.

Not exactly hurting sales was the decision to market those computers through two of America's largest retail store chains, Sears and Zayre. Another large American retailer, J. C. Penney, is rumored to be close to finalizing a deal with Commodore too. Stockholders in the firm were probably very happy when they received 128% higher earnings for the first three months of this year, again compared to the same time period last year.

★★★★

News on educational programs: Milliken Publishing Company has just announced that it is putting its EduFun line of programs in ROM cartridges. Their line is designed for children between the ages of five and fourteen years, so the decision was made due to the fact that such a media is less prone to disaster compared with cassettes or discs. The faster loading time is a secondary but important consideration too.

The programs are basically games, but in order to win, a user must master one or more basic skills. The cartridges (of which there are three packages of two games each so far) all cost $35, and run on the Atari 400 and 800 and the VIC-20. They will be available for the Commodore 64 in the fall sometime. Milliken is based in St. Louis, Missouri.

That's it for this week

Bud Izen **Fairfield, California**

Intergalactic games for earthlings

Visit strange planets, meet weird alien civilisations . . . and shoot them.

Alien Taxi
TRS-80 Models I & III
£12 (cass.) £14 (disc)

Microdeal, 41 Truro Road, St Austel, Cornwall PL25 5JE

Alien Taxi is a simple game to play, but, I found, one of the most difficult to master. Using the arrow keys, or a joystick if you have one, you guide a small space ship off a launch pad (next to a hotel) and land on other space ship 'pads' to collect passengers.

The amount of thrust you give to your ship is shown on a speed indicator in addition to the physical speed of your ship.

The sound is also a great help as it echoes the speed of your ship by rising in tone with the increase of speed.

This is not a game that you will master easily, but if you allow it to go into the demonstration mode you will quickly get the idea of how it should be played.

The landscape scrolls horizontally. Though, due to my lack of skill, I have not seen all of it yet, I get the impression that, as my skill increases there are more challenges awaiting me around the corner.

D.B.

instructions	50%
playability	70%
graphics	60%
value for money	60%

★ ★ ★

Frantic
VIC-20
£5.50

Imagine, Masons Buildings, Exchange Street East, Liverpool, Merseyside

One of the favoured activities in many computer games is to kill as many aliens as possible. This game is no exception.

You pilot a space-ship descending through a planet. Sundry aliens appear and shoot at you. You, if you can, reciprocate. As the aliens shoot, some nice graphics give a 3D impression of a laser coming at you.

To help you locate the nasties, you have two radar screens. I found these screens difficult to interpret and not really much help.

Overall the graphics are above average but the aliens appeared as messy, multi-coloured blobs.

For some reason Imagine have this aversion to sensible and clear instructions. The first 50% (the bit describing the mission) was simply gratuitous rubbish which, if anything, made the game appear to be better than it was. Come on Imagine, give some decent instructions.

The key options for controlling the ship, however, were excellent.

A.W.

instructions	50%
playability	70%
graphics	75%
value for money	60%

★ ★ ★

Planet Conquest
Dragon-32
plus 1 joystick
£6.95

Blaby Computer Games, Crossways House, Lutterworth Road, Blaby, Leicestershire

Lunar Lander games have never excited me over-much, but this at least offers variety with options for colour or monochrome TVs, five skill levels and a progression through three screens.

On the first, you land your descending triangle of a ship on one of five flat pads, the number of landings varying with the skill level.

Success brings the launch of a rocket and a trickier surface, then you hopefully go on to a third screen where your ship will also be fired at from the ground as it descends.

Retaliation is at hand, though, as the fire button will shoot in the direction of travel to remove either a nasty piece of landscape or an even nastier inhabitant.

This joystick control is smooth, and a welcome change from the usual frantic keyboard punching, though it is possible to bump against parts of the planet without being wiped out. This is a drawback, as is the lack of a high-score record.

The high-res graphics are acceptable, though won't take anyone's breath away — in fact, that can also be said for the game itself.

M.G.

instructions	80%
playability	60%
graphics	50%
value for money	50%

★ ★ ★

Galactic Commander
BBC B £6.95

Micropower, 8/8A Regent Street, Chapel Allerton, Leeds L57 4PE

This is a variation of the Luner Lander arcade game. There are nine levels of increasing difficulty. Graphics and sound are excellent, but due to mode 4 the colour is limited. Keys are responsive and easy to operate.

I found this an addictive, challenging and enjoyable game. Level 0 is easy, levels 3 upwards very hard.

The instructions are good but include a few spelling mistakes. No score of hall of fame feature, but an option to play a particular level or go through the whole sequence to achieve a Galactic Commander qualification. Some nice, humourous comments are given!

R.E.

instructions	95%
playability	90%
graphics	97%
value for money	90%

★ ★ ★ ★ ★

Xenon Raid
Atari 400/800
32K £14.95

English Software, 50 Newton St, Piccadilly, Manchester

The scene: a convoy of vital new weapons is being transported by road to aid in the war against the Xenons.

Your mission: prevent any of the raiding parties from destroying the convoy.

Three Xenons at a time attack your scoutship as it patrols ahead of the main convoy. You must blast them or wait until their limited fuel reserves dry up, forcing them to abandon the attack.

Next, you must load the refueller with fuel pods and dock with your scoutship in time, then back to the attack.

Xenon is **fast**, with good sound effects. If you enjoy do or die games, Xenon's five levels and three difficulties should keep you happy for a long time.

M.F.

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

★ ★ ★ ★

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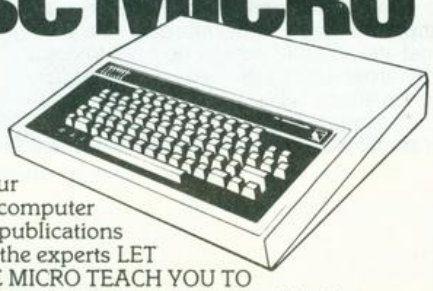

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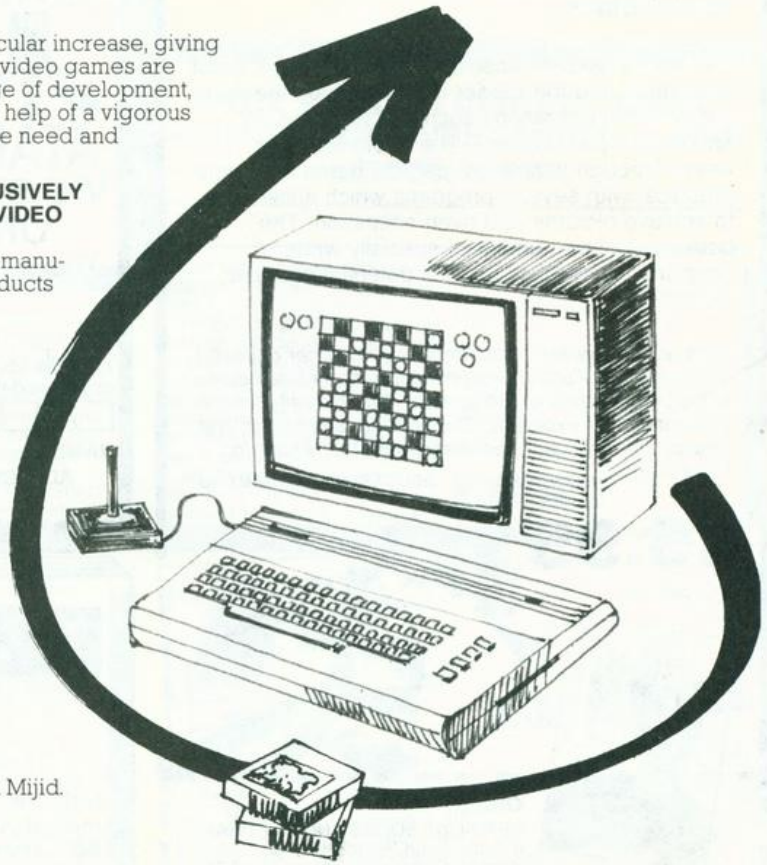

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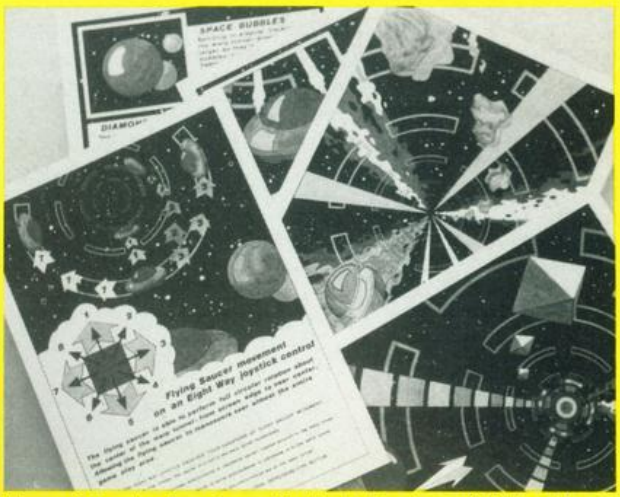
In search of the ultimate game

Ultimate Play the Game has shown that you can go a long way in eight months. One of its four directors, Timothy Stamper, told Candice Goodwin some of the secrets of the company's success



Some of the storyboards used in the design stage of Ultimate's games

Carole Ward, Ultimate's graphics expert and co-director

It wouldn't be entirely true to say that the name of Ultimate Play the Game is on everyone's lips — it's too much of a mouthful for that. But in a mere eight months, the company has certainly made a name for itself among Spectrum owners.

Its first program, Jet Pac, got rave reviews in the computer press, HCW included, and propelled itself at high speed up the software charts. Its second release, the strangely-named Pssst, was equally warmly received.

And Timothy Stamper, one of the four co-directors of Ultimate Play the Game (henceforth to be referred to as Ultimate), says eager fans have been clamouring for news of the two latest offerings, Tranz Am and Cookie.

Timothy has no false modesty about his company's achievements. "We're really excellent at arcade games", he said. "We chose his company's name because we felt it was representative of our products: the ultimate games. It's also a name that sticks in people's minds."

Ultimate's only slightly more than overnight success becomes more understandable when you find out that three of the four directors came straight from designing games for arcade machines.

"We were working in the arcade game field for two-and-half years, selling games to the US and Japan", Timothy recalled. "So we've got an advantage over other companies because we've got enough experience to know whether a program or concept will sell.

"But in term of the arcade machine market, we were just a small company. The big companies in the field were starting to use sophisticated techniques like laser disc storage, and that's amazingly expensive. It takes millions of pounds of investment, and we couldn't afford it".

So the three decided to move into the computer games market. They produced a couple more arcade games which they sold to Japan, and used the proceeds to set up Ultimate last November.

Most of the start-up money went into buying an advanced development system for writing programs on.

Timothy said: "It'd be a bit basic to develop programs on the Spectrum itself. With our equipment we can make modifications on the development system and run the program simultaneously on the Spectrum to see the effect.

"We've got very powerful programming tools on the development system, and we could produce a different program every two weeks on it. It also means we can convert programs very quickly to run on other machines."

Timothy was unwilling to give much away about the system Ultimate uses, but he would say: "the largest arcade company in the States had a custom-developed Hewlett Packard system, and our is faster than theirs by a long way."

He was equally cagey about how much the system cost, but said that it was several thousand pounds.

When Ultimate was set up, the three partners took on a fourth director, Carole Ward, with a degree in graphic design. The other two directors are John Lathbury and Timothy's brother Chris, both of whom are qualified software engineers.

Ultimate never uses freelance programmers. According to Timothy: "There are some very good programmers about, but they aren't quite good enough, because they don't know the market. We wouldn't buy the rights to someone else's program, but we might buy the rights for the idea, if it was a good one."

Not that ideas are something Ultimate seems to be short of — Timothy claims that they have hundreds of concepts just waiting to be turned into games. Once one of the team has had an inspiration, all four of them put their heads together to work out what the final product will look like and what will happen in the game.

Ultimate's ultimate aim is to produce a new game each month for all the big-selling micros. The reasons for starting out with the Spectrum were purely economic — to finance the costs of the development system, and to provide revenue quickly, they needed a big-selling computer, and the 16K Spectrum fitted the bill.

Now that the company is well under way, they plan to adapt the games for the VIC-20, Commodore 64 and Atari micros, as well as moving into 48K Spectrum games.

But its aim will still be to keep prices competitive. "Our sales strategy is to supply the best product we can produce for the least money", said Timothy.

It's a formula that seems to have worked so far. Ultimate's programs are on sale in most of the high street chains, and Timothy reckons that the company's turnover will be "into the millions" by the end of its first year. Take off a proportion for poetic licence, and that's still a healthy figure.

Mind you, that has come about by the four-partners putting in a 16-hour day, seven days a week, at the company's headquarters — a cottage at The Green, Ashby de la Zouch in Leicestershire.

And most of the first year's revenue will, Timothy says, go straight back into the company. "We believe in keeping our products at the top, and we'll invest money to do so."

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D.T. feted . . .

May I thank your reviewer D.T. for a very fair review of my program SYS 64, in HCW 19, in view of the errors contained in the program's instructions. These are now being corrected, but I would like to point out another error (yawn) to those who have already bought the program.

A PRINT statement does not have to precede every LPRINT — just one will do after a CLS. This also applies to LLIST.

By the way, the program does not need to combine characters to put them on the screen as it has routines to place each character on the screen independently. This was the only convenient way to make AT, TAB, DELETE etc work in 64 column mode. There is a demonstration on the tape (LOAD "demo") to show this.

Ron Seniscal, Hull,

. . . And slated

We thank you for the review of our cassette The Visual Processor, but we feel that your reviewer D.T. has entirely misunderstood the purpose for which this program was written.

It sets out not to teach machine code but to provide a stepping stone to an understanding of microprocessor operation, which is one of the most difficult concepts to come to terms with on the road to learning machine code.

It was designed as a visually interesting and easily understood simulation for a teaching situation, in which it has been used successfully by the author.

We feel this misunderstanding may have occurred because the pre-production cassette which the reviewer was sent was not accompanied by its comprehensive manual. We were therefore pleased with the instruction and usability ratings given, as these were obviously based solely on the prompts that the program provides (or he has amazing powers of ESP).

With regard to there being only 16 instructions, it is interesting to note that the language Cesil, which is taught to O-Level Computer Studies students, has only 14.

Concerning the fact that 'end' is printed as part of a prompt, in current production versions 'END' has been substituted even though it was close to impossible to enter it in lower case anyway.

T. J. Gilberts, Gilsoft, Barry, South Glamorgan

Club corner — in Leeds . .

The Garforth BBC User Group meets on the first and third Tuesday of every month. Meetings are at 7.30 at Garforth Welfare Hall.

Dave Carlos, Garforth, Leeds

. . . in Manchester .

Manchester Atari computer enthusiasts meet at 7.30 every other Thursday evening at the Ellemere Hotel, Worsley Road, Worsley, Manchester. For further information, ring M. Davies on Bolton 700757 or Jack Young on 061-799 0124.

M. Davies, Bolton, Lancs

. . . for BBC disc users . . .

A group of BBC disc users is getting together to produce a monthly disc for members of the Format 40/80 Disc Club.

The idea is to exchange programs of all kinds, including school, educational and of course games. This will be done by a monthly disc to members ready to BOOT up with menu.

Would any interested BBC disc user please send a stamped addressed envelope giving their disc details, for more information to myself at the address below.

Peter Hughes, Format 40/80 Disc Club, c/o The Lending Library, Five Marsh Street, Bristol BS1 4AA

. . . for ZX micros . . .

The International Sinclair User Group has now been formed with the blessing of Sir Clive Sinclair and Sinclair Research.

The group will cater only for Sinclair micros, and will publish a monthly newsletter, ZX Press, and a quarterly supplement which will form into a reference manual.

The group will supply Sinclair related products to members at discount prices, and further proposals are close liaison with Sinclair Research and the formation of a software library. Anyone interested should contact us at the address below.

V. Webber and P. Paton, 176 Todmorden Road, Burnley, Lancs

Don't let the micro fans suffer

I have been interested in computers for about a year now, though I did not get my own computer until Christmas last. Over the past months I have watched the industry grow, and there is a fair share of good and bad companies.

Since issue two of HCW I have read all of the readers' comments and noticed the following two points seem to occur. I have called these a grumble and an annoyance.

Firstly, buy-and-try shops are a well discussed subject among those in the business, and I believe that these kind of shops are not a bad idea. The thing that is at the centre of the subject seems to be illegal copying.

Seriously, I think that the tightening of the belt that is going on is going to hurt many people. Not just the company concerned, but the person doing the copying.

I have heard that you can even get fined for not reporting someone that you know is copying tapes etc. A lot of the time it is only young people who are copying a friends tape because he cannot afford his own. I think that copying should be stopped but in a different way if possible.

Secondly, incorrect advertisments seem to be cropping up all over the place these days. Claims that are made but not included in the final product, untold hidden extras, long periods to wait when quick service is stated, these are just a few of the things that are getting out of hand.

I really do think, and many people that I know would back me up, that companies should get their policies right. It is putting a lot of first time-buyers off computers, just because some companies are not telling the truth.

I hope that points are settled soon before it is too late and we all suffer.

D. J. Meehan, Woking, Surrey

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