Type in our great game for the TI-99/4A . . . and have fun — page 13

Cricket scoreboard program for the Spectrum — page 25

More programs for VIC-20, Commodore 64, Spectrum

Programming advice for Atari and Oric

1¼m more micros, says new report

Another 1¼m people will own home computers by the end of the year — most of them male and aged 15-44.

The figures are from a new survey which estimates that computers worth £216m will be sold along with £30m worth of peripherals and software sales of £54m.

Commenting on the age of computer users, Mr. Edwards says, "This reflects the higher level of familiarity with new technology among the younger age bands and the disposable income in the 30s to 40s age band."

Continued on page 3

Micro games by cable next year

Games are to be sent by cable to home computer users.

W.H. Smith says its service will start next year and subscribers would choose from 20 games.

Each month some would be deleted and more added.

It will be the first service offered by the company's newly-formed cable services division, planned to serve cable and

Continued on page 5

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1½ m micros

Continued from front page

"This is further endorsed by the highest ownership level being in the AB socio-economic groupings (middle class), discussing progressively down the groupings."

But it points out "Over half the adult population has no desire to buy a home computer."

This rating is highest among women (64 per cent). The rating grows from 38 per cent of teenagers to 80 per cent of those over 65 and from 38 per cent of the AB grouping to 20 per cent of the C group.

The consumer research, therefore, suggests a potential market for home computers of over 1½m units.

"The very high desire to buy" segment of this demand will account for about 1½m of these units. This group is likely to respond to its desire sooner than later,"

Last year, Mintel says, 356,000 home computers — worth £566m at retail prices — were sold. Software worth £160m and peripherals valued at £100m were also purchased.

Half the sales of computers were in the Christmas shopping period. And for each month sales broke down into 72 per cent hardware, peripherals 10 per cent and software 18 per cent.

The exception was January when, following Christmas computer buying, software sales doubled their proportion.

Mintel finds price cutting in high street shops "a strange aspect" and says "This may be to attract market share or to de-stocks in anticipation of new products replacing those currently available." It expects this trend to continue into the second half of the year with the rate of fall easing.

Prices could drop by up to 15 per cent a year.

And Mintel sees high street multiples may well bring out their "own brand" computers.

It says, however, that multiple retailers were not looked on as favourably because busy shops made service difficult, after-sales care was poor and training had been inadequate.

Specialist computer chains had been strengthening their position by providing trained staff, technicians and engineers on hand and other facilities for buyers.

Mintel sees specialist chains such as Lasky's as growing and will still be more significant elements in the market next year's 17 per cent.

Estimates of the share of trade this year (last year in brackets) give W. H. Smith 18 per cent (17), Tandy 12 (12), Laskys 5 (3), Spectrums 8 (5), Currys/Micro C7 (4), Greens 4 (5), Davons 2 (3), Boots 2 (2).

Mintel's report. Home Computers, also goes into detail about other aspects of the market. It costs £95.

Mintel, 7 Arundel Street, London WC2R 3DR.

Cable games

Continued from front page

supply TV and headed by 37-year-old Francis Baron.

W. H. Smith has signed a deal with the Games Network, of Los Angeles, to distribute its services in the UK and Europe.

It says that the Games Network has a large and growing library of games — about 25 per cent educational — and suitable for all ages.

Although at the start the programs would come from America, there were plans to develop new games in Britain for distribution here and around the world.

W. H. Smith's chairman, Simon Hornby said: "Although we decided, after a great deal of research, not to join a consortium for investment in the actual cable operations, we have been keeping a close watch for opportunities in this field."

"The Games Network will be one of the first steps into providing cable services, and we are setting up this new Cable Services Division as we plan to introduce other services for cable operators."

W. H. Smith says that the Games Network will increase the overall market for computer games.

The Games Network will be in operation for the first time in Britain at the Cable and Satellite Television '83 Show at the National Exhibition Centre, Birmingham, on September 11-14.

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.

Competitive rates are paid.

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 Ligtrot, Home Computing Weekly, 185 Charing Cross Road, London WC2H 0EE.
Learning at home
It just goes to show that you can't keep a good micro down.
After Sinclair's early setback in the educational market, when the Spectrum missed out on being chosen by the government for use in secondary schools, it has bounced back. It is now the first company to offer the Micro-electronics Education Programme (range of educational software) direct to consumers.

Spectrum gets down to business
Oxford Computer Publishing has come up with two ways of making your Sinclair do home work for its living.
Finance Manager is intended for small business as well as home accounting, and has facilities to deal with automatic double entry, standing orders, accrual balances, new transactions, and bank statement reconciliation.
Address Manager is a filing, despatch and retrieval system for up to 400 addresses (in 40k).
Both programs are written in machine code, and both cost £8.95. Finance Manager is for the 48K Spectrum only.

Filing mode simple
Simple Software, formerly specialists in programs for the PBP, are now branching out into material for the Commodore 64.
Simple's latest offering is Simply File, a desk based database management system for the 64 and PET.
As the name suggests, the program is basically an electronic filing system which enables you to index, group and search for records in a number of criteria. It will also carry out calculations on groups of records, output information in the form of files for use with other programs, and if you've got a printer it will print out labels and summaries of selected groups of records.
Should you have the Simply Writer by the go-together package, it will work in conjunction with that too. Capacity is about 400 records of 254 characters each.
Price: £8.95
Simple Software, 15 Havelock Road, Brighton, Sussex BN1 8CL.

The Spectrum did get picked for use in primary schools, along with the BBC B and RNM 480Z. The MEP range that Sinclair is now selling was specially commissioned by the Department of Education for use with these three micros, and includes programs for maths, reading, language development and problem solving.
Sinclair believes that there still aren't enough micros in schools for children to make the most of the software range, and by selling it commercially, hopes to encourage learning at home too.
The four packs in the range each contain two software cassettes and full instructions, and cost £24.95 each.

Sinclair Research, Educational Division, St John's Wood, Camden, London NW3 3PS

Cartoons on computers
Cartoon strips B-C and The Wizard of Id are being turned into a series of games and educational programs.
When they will go on sale in America and Canada, but the Sydney Development Corporation says they will be coming to the U.K. soon.
Sydney has signed a licensing deal to use the characters created by award winning U.S. cartoonist Johnny Hart. His strips appears in several U.K. newspapers, including London's Standard.
Over the next 14 months Sydney, based in Vancouver, plan to bring out eight programs — for computers like Atari and Commodore 64 - called Quest for Tires, Wartype, Wartrop, Wizib, Wizmat, Wizspell, Dot to Dot Zoo and Bung Juggler.

Talking about maths
Children aged four to six can learn maths with a VIC-20 program which "speaks" to them, says Currah Computer Components.
Chattermaths, priced at £4.99, generates as voice from words sounds to ask and answer the questions. Correct answers make a figure climb a ladder.
Currah says the program is the first of a range of educational "speechware" for different age groups.
Currah Computer Components, Greythorpe Industrial Estate, Hartpool, Cleveland.

Price cuts that fuel micro wars
The millions upon millions of promotional pounds now being lavished on small computers (£4m from computer master Mattel, £10m from veteran Commodore) underline one widespread and unforeseen side effect of the micro-electronics revolution. That is, to create so great a product proliferation as to destroy price levels.
Since using the personal computer itself can be bewildering, the result is one of the strongest boom markets in history.
All over the world, people are buying sophisticated machines in large quantities and often at silly prices: even after a £16 cut, the Commodore 64 still costs £229. Yet many purchasers are not using their new babies to anything like their full potential. It's no longer true, in the States at least, that the overwhelming home use is for playing infatuated games. But early infancy is the present age of the computerised home.

Paradoxically, toy manufacturer Mattel is now trying to make the home computer more adult by offering a £100 console that will save lucky purchasers the bother of switching on the light. But is the buyer wise to fork out £799.50 for Mattel's Aquarius offering, without the that optional extra? Is the Sinclair Spectrum worth its few pounds more? And what about all the alternatives, exact and on the way?
Because of the attractive potential of the market and the ease of design, manufacture and entry created by the chip, it's almost anybody's game.
So sweeping a state of introductions and introductions simply give the consumer too much choice. Rational buying decisions have become as difficult as the market as in hi-fi, where again model proliferation is to blame. The consequences are already evident and inevitable.

The price wars that have forced down Sinclair's bottom line, the range price to £25 in the States will become endemic in many markets. The office of the future, for instance, is likely to be hit by price wars even before that future has become reality.
The price will plainly become too hot for some. Already, Texas Instruments has run into huge losses, while Tandy (which makes Sinclair's computers and markets them in the States) has met some heavy weather. If we were to a former, or Sir Clive's expected new offering fails to wow this oversupplied market the outlook for Britain's pioneer would become thick with dark clouds — especially now that the Americans are raising the advertising use so steeply, while cutting prices as sharply.
Truth has become as strange as fiction. In 1967, when Ivor Williams began his Management Today series on a mythical company called Hippo, he brought up an obviously mythical product: the expensive computer.
At £25, his dream has practically come true. The only trouble is that it probably means many expensive companies.

Robert Heller
Editor, Management Today
(this column is reproduced from Marketing magazine)

This space is for you to sound off about the micro scene, to present bouquets or to hurl brickbats. Share your view by writing them to Paul Lip- ton, Opinion, Home Computing Weekly, 164 Clarion Cross Road, Lon- don WC2H 0EE. Please include your occupation and your interest in com- puting.
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Acme, son of Bug-Byte

Bug-Byte has spawned another new software company
First some employees left to set up Acme, and now Alan Maton, 32, and his 26-year-old wife Sue have done the same.

Acme Software's home is a small office in The Albany, a building in central Liverpool where Bug-Byte began.

Bug-Byte co-director Tony Miller said: "It tends to happen at this time of the year, in time for the Christmas sales."

"Allan is a good friend of mine, and we have spent many enjoyable evenings together. I wish him the best of luck, and I think he's going to need it. It's quite difficult to make a name for yourself now."

"You are dealing with a few large firms who know what they are doing and have been doing it for several years."

"I hope Allan makes it. He's got the knowledge and the get-up-and-go."

Mr Maton, whose first four games go on sale in September, said: "You can't beat bunging your own boss. It's quite a challenge and I'm enjoying every minute of it."

"If I fail I've only got myself to blame, but if I succeed it will have one of the biggest heads around."

At Bug-Byte Mr Maton was responsible for despatch and checking on stock at dealers and distributors and Mrs Maton was Mr Miller's secretary. They say all their games will cost £39.50 Two of the first four are for the Vic-20; Alien, a space game, and Bridgejam, in which the player guides a man across bridges.

Connect Four is for the Lynx and Practically Impossible, a five level abstract game, runs on the Spectrum.

The next release will be an adventure for the One and Colour Game.

Acme will soon have its first employee, 16-year-old programmer Chris Cannon, whose job will be to evaluate programs.

As first the programs will be sold by mail only and then, Mr Maton says, Acme will establish a dealer network and take on more staff.

Acme Software, 49-51 The Albany, Old Hall Street, Liverpool.

Clockwatching computers

Glanmire's Controller lets your ZX micro keep an eye on the time.

Software for a rare beast

If you own that rare beast, the Lynx, a new company has come on the scene to sell software for it. Bus-Tech is Steve Pearson, Julie Hume and David John Munday, who hope to have their first programs ready to sell within a few weeks.

Though initially the company will be offering six arcade-type games — Lynx Muncher, Battle Brick, Death Ball, Zombie Panic, SS Orion and 3D Maze — the aim is to have some educational software and a graphics utility soon.

Meanwhile, with each order, Bus-Tech is giving away a simplified version of the graphics utility free. The games will be priced in the £4.50-£6.50 range.

Recorder discount

If you buy a Spectrum from Smiths, you can get a £10 discount off the price of Smiths' own brand of tape compatible cassette recorder, the CCR800, which normally costs £34.95.

A Smiths spokeswoman said that the offer would be open "indefinitely."

W H Smith, Strand House, 10 New Peter Lane, London EC4 1AD
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SOFTWARE REVIEWS

**Spritemap Commodore 64 E7**
Interceptor Marko Lindon House, The Green, Todmorden, Hants

This is not a game to start playing if you have to go out in the next hour. It is a game for the man where you run round a maze eating dots portrayed by four ghosts, trying to keep track of their positions at the same time.

Galactic Invasion Commodore 64 £6.95

The instructions are clear and concise and give you a guide to tactics you might use to attain a high score. A joystick makes life much easier especially with the speed some of the ghosts move at.

The graphics are very good and even if you are not skilled enough to get past the first screen, the game is fun and completeable.

A minor criticism: the remaining寿命 is cramped at the top of the screen and unless you use your finger at the highest score you get little chance to read it when you have run out of your three lives.

This is particularly relevant when you have three or four children playing, and they want to keep track of their personal high scores.

Instructions: 80%
Playability: 85%
Graphics: 80%
Value for money: 90%

**Frogger VIC-20 £3.99**

Rabbit 330 Station Road, Harrow HA1 2DE

For the benefit of any Morons who have just bought a VIC-20, Frogger involves placing a small frog across a large road followed by a large river to its resting place on the opposite bank.

The journey faced by the amphibians in this program is very hazardous involving slow cars, fast cars, buses, trolleys and alligators.

Noticeable by their absence are several features of the original game such as diving turtles, little bugs and frogs which can be killed to safety and by a car, but the game is complex and challenging as it stands.

Graphs are good, especially the alligators — not for those with heart trouble. Sound is almost non-existent, a fact I have noticed in several rabbit productions, but I suppose you can't have everything.

No frogs were found except possibly the leek of time limit. The bottom right hand corner of the screen clearly shows how the frog is Frogger, but that is as far as it goes.

It makes a change to do something humane for once in stead of using yet another galactic civilization.

Instructions: 70%
Playability: 80%
Graphics: 80%
Value for money: 75%

**Space Invaders TRS-80 Models I & II, Genie I & II £14.95**

Mollers 1, Blackheath Road Town Hall Square, Romford on hearth Esseuses

This version differs from many Space Invaders in that it allows the user to set a large number of variables at the commencement of any game. Such attributes include the scores and number of alien shapes, and sound and visual effects that may be turned on or off.

Sound is also adjustable, though I couldn't get the feel of it on my TRS-80 model III. Alien space ships gradually move down the screen and attack the player. The aim is to destroy them by machines with colour and sound.

The third expert level would really have to be written in assembler if it is to achieve a respectable advance on the level where the Earth is protected only by flat out.

Instructions: 80%
Playability: 70%
Graphics: 70%
Value for money: 75%

**Moze Chase Spectrum £4.95**

Howson, 8A St Mary's Street Wallingford, Oxon OX10 5EL

Unlike some programs, this one does not pretend to be what it is not. It is basically Pacman plus or minus a few features. There are four ghosts a man (instead of a month) and it's and boned strawberries and lemons to eat.

The ghosts are all white and behave in exactly the same way as each other — they do not have noses and paws like their arcade brothers. The graphics are just user-defined and are not very clever.

There are four modes on the 16k version and 12 on the 48k version. You can choose which ones you want. The appearance of the ghosts and the speed of the pacman is adjustable.

This is a very good game with a wide variety of difficulty levels and a lot of fun.

Instructions: 75%
Playability: 80%
Graphics: 75%
Value for money: 80%
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Warning: cigarettes can damage your home, your guests ... and your robot

Careless smokers cause fires. Can your heroic robot collect the cigarette ends before your party turns to ashes? Find out with Tony Garner's program for the standard TI-99/4A.

It's a great party but your guests can't seem to find the ashtrays!

Luckily, you have a robot which should collect the cigarette ends — guided by you and your TI-99/4A — before they become a fire hazard.

If a room contains 10 cigarette ends, the heat causes it to burst in to flames and, if the robot is trapped in the room, it perishes and the game comes to an end.

Otherwise he carries on with his heroic mission in the other rooms until he has cleared up the number of cigarette ends you selected when the game began.

Each time he bumps into a wall, a wall of furnishing his arm gets temporarily dispersed and he becomes incandescent while three extra cigarettes are dropped.

In four rooms are destroyed the game becomes a question of survival — the player's original figure is ignored while the demoralised robot tries weakly to keep two rooms, and finally one room clear.

There is no limit to the number of cigarettes that can be requested but, for a competitive game, it would be best to increase them gradually from about 30.

Regardless of average, the best score is the highest. But the average can be increased by incidental hazards. These increase your possible score without raising the number by which it is divided.

The range of the robot can be altered by changing the total of GOSUB 280 lines between 110 and 220.

The game can be made more dangerous by adding more GOSUB 210 lines in the same place or between lines 560 and 970.

Hints: conversion
CALL HX CONVERT ASCII value in the variable D

CALL SOUND generates note or noise in following order: duration (negative values enable program to proceed during sound) note value (110 = low, 221 = middle C, volume 0 is loud, 30 is quiet) A negative value from 1 to 8 produces note three notes and one note can be bled at one time.

CALL UCHAR puts character (r = low 1 to 24, column 1) ASCII value and, if needed, number of repeats after and includes initial position, horizontally.

CALL UCCHAR as above but vertically.

CALL UCOLOR sets character set (multiples of eight from 32 to 15) foreground colours (1-16) and background colour (0-3). Transparency: 0 black, 3 dark blue, 7 dark red, 10 light red, 12 light yellow, 13 dark green, 14 magenta.

The data line in 1950 will need to be adjusted to the new dimensions of the room which will be set, depending on screen size, in lines 2360-2620. Doses will also have to be altered.

Graphs are designed to fit 2400-5070 are 42 robot 120TIMER 125 ash 126 cigarette end 144 chair 104 female guest 96 male guest 152 top wall 154 line wall 155 interval wall horizontal, 156 central corridor, 157 vertical wall.

The programs will well made at normal 16K but the array DIMs reached in 240 consumes a lot of memory.

The TI does not allow multiple statement lines, but these may well be required for other machines will less available memory.

The GOSUB structure should make life easy for the HMC micro users instead of a straightforward adaption.
Britain’s liveliest weekly for home computer users has thousands of pounds of prizes to be won in its **September** issues. Each competition has prizes worth at least £1,000.

And **September** is top value month for Home Computing Weekly readers. Each issue will have extra pages packed with information and quality games listings to type in. All this costs the readers the same as usual: Just 38p!

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**DRAGON**

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Economical strings
Ray Elder quite correctly points out in his article, The BASIC String in his June column, that using a string variable to store data on the ZX81 effectively means more than twice as much memory as the length of the string, when the string is defined in a program line. He suggested using STRING variables combined with PEEK and POKE as a valid and useful method of handling data.

However, there are two possible ways of using strings to store data which do not involve wasteful "double-up" of the data. The most familiar of these is to define the string by means of a command rather than in a program line. Thus you can write a command:

```
"Hello"
```

and then a program to PRINT the data may be:

```
PRINT "Hello"
```

This routine must be surrounded by the command GOTO 10, so RUN would CLEAR ALL. Another method, perhaps not so familiar, avoids the use of string variables altogether, although it does utilise a string in a program line. It has the additional benefit that the program can be RUN from a disk.

Obviously this is an extremely simple example for illustration purposes. One could also write, for example:

```
"He was a young man from the hill"
```

or:

```
"He was a young man from the hill"
```

Here's a quotation from the last example above:

```
In this case, the first string in line 20 contains the most significant byte, and so could string contains the least significant byte, of a two byte data set.
```

Of course, use of the technique need not be limited to PRINT statements, the following GOTO statement:

```
GOTO X = IF VAL (data) THEN can all be used, as with any other value in a program line
```

Nick Godwin, Eynesbury, Berwick

Microfair goes north
I have good news for M. Loyan who wrote in HCW 17, complaining about the lack of microfairs in Scotland. The Synthclyde Home Computer Fair takes place on August 26-27, at the McEwan Galleries, Sauchiehall Street, Glasgow. The fair will open to the public and exhibits are from not only Scotland but from the whole of the British Isles. We hope that this will be the first of many yet to come as we feel sadly left out in the microfair circuit by M. P. Moir, Rank Girls, Hamilton, Scotland.

It's time we leaned on micro makers
I am starting 4 Rat File on the Oric, I am one of those poor unfortunates who bought an Oric-Minted by their advertising, Professional Keyboard! 11 Colours! 28 days delivery! I am also one of the unfortunate who so badly needed the Orci switchboard about delivery dates. If any of your readers have bought an Oric and feel that they were deliberately misled, either in the Oric specifications or delivery dates, I would be pleased to hear from them.

Similarly I would like to hear from anybody who has had experienced problems with their after sales service. I am still waiting for a reply to a letter which I wrote to Peter Harding (Sales Director) in early April at the request of their P.R. consultant.

"We, the computer buying public, have been badly sold by the manufacturers and I feel it is time that we put some pressure on them. Similarly Acorn and Commodore have also misled us with unreasonably delivery dates, ambiguous specifications and/or very late "commo- soon" add-ons. But I bought an Oric, so it's Oric that I'm making a fuss about.

One other aspect to the software houses, following recent reports, letters and complaints. Don't expect too many women customers when successful adventurers are rewarded by marrying princeses if you want to alternate half your potential market, and ultimately half your potential authors, fine, as long as that is what you intend to do — Keith O'Neill, Hookstone, Goldsmith Avenue, Crawley, East Sussex TN6 1RG

My Oric's not so bad
Having read many articles in established computer magazines (Home Computing Weekly being one), I have found that people who write about the Oric always point out the bad points and ignore the good.

I have had my Oric now for nearly six months and I am very pleased with it. (It seems I am the only person who will!)

Admittedly it was very late in arriving, but when it did arrive, I found that what you can do is only limited by your imagination and your ability to write programs, and as software is becoming more readily available, things are definitely looking up for Oric owners.

Alan Greenshields, East Lothian, Scotland.

Problems with Vanguard
There seems to be a few problems with the listing of my VIC 20 program Vanguard, which was published in HCW 21. Most people who copied the program in have probably noticed that the first file contains the listing of the program with the benefit of whose who has, the problems and solutions are as follows:

Line 6530 should read POKE 196, 0, W 70, 8, 1
The line number 6515 between 6500 and 6510 should actually be 7000 and you should also remove PRNSO from the beginning.

Line 6900 should read

```
GEO (GEO) GREEN G RED 2 SPACES GREEN F RETURN
```

The words inside the square brackets are control characters and spaces.

One solution to the initialization program is the second one — Peter Beresford.
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Kaktus
Commodore 64 + Joystick £9.20
Supersoft Winchester House Chertsey Road, Weybridge, Middlesex KT15 2SR

This game must be one of the most unusual yet devised for the 64. The object is to protect a large green cactus at the centre of the screen from an assortment of desert creatures. Wasps and hornets circle the cactus and gradually get lower until they take a bite from the base, all the time discharging a mist of 'droppings' which hit the surrounding desert floors. Purple buzzards drop hawking eggs lethal to your muscle wash and which eat away the green in great numbers. Green blooey modes fill the patches of ground and can trap your base on each side of the cactus, but there are sometimes when shot.

Your cactus can survive 10 bites at its base, and powers can be eaten if the roofs are left unlit. But if the ground should be eaten away, the cactus will fall in an explosion of green, and you'll lose life.

64 owners should enjoy this game for its graphics and originality, but bear in mind it is fairly expensive.

L.C.
Instructions
Playability
Graphics
Value for money

Acmeen
Mutoids
BBC B/C £6.95
Soft Joe, Clapham Road, Mitcham, Surrey CR4 1RB

This game doesn't fit any previously categorized settings. It is really a cross between an adventure and a puzzle game. You wander around a captured spaceship, using a laser gun and trying to avoid moving ships. The stated aim is to survive and to set the self-destruct mechanism so that the aliens are prevented from reaching Earth. Your only simple survival was my main problem.

The game is rather boring after a while despite the six play levels. If you are unable to do anything before the time runs out, you are asked to read the instructions card that comes with the game to see why.

The graphics are not very impressive and the game is far too short and rather simple. The real problem is that the game relies far too much on random factors and not enough on skill (or lack of it). The graphics are good although the characters are rather small and the graphics are not very exciting. I would not recommend it for its contents and should not appeal to younger players.

B.C.
Instructions
Playability
Graphics
Value for money

Mangrove
Commodore 64 £9.20
Supersoft, Canning Road Harrow, Middlesex HA3 7JS

This game can be played with a joystick or keyboard. It requires you to maintain a cluster of healthy cells against attacking cancerous cells.

The wandering cancerous cells can quickly break up into large groups, and small clusters which then grow away. In fact, so quickly, that I found the game frustrating and equally quickly lost interest.

The screen display is clear and makes use of customized characters for the cells. At the top of the screen is displayed the number of healthy cells remaining, the current score and the highest score.

You can obtain some repairs from the onboard of the hostile cells by firing off a dose of radiation, but you have limited supplies.

Although the instructions card that comes with the game is quite clear I think some younger children will find it hard to understand the mechanics.

The concept behind the game is good but I feel it could have been implemented more imaginatively with better graphics and sound.

L.C.
Instructions
Playability
Graphics
Value for money

Matrix
Commodore 64
Joystick only £8.50
Llamasoft, 45 Mount Pleasant, Tedley, Harrow, M26 5NN

This is an action-packed game making very good use of the 64's sound and colour features. Your spacecraft is located within a matrix (it moves) — clear the zones of drones (snake like creatures racing around).

While avoiding the bombs from the drones you also have to avoid the laser beams fired vertically and stay clear of delayed attack bombs fired horizontally across the matrix. If, by some miracle, you clear the zone of drones then you proceed to the next higher zone of greater complexity. There are 20 zones in all.

On your travels through the zones you are likely to meet nasty humans who point out your position to the enemy, deflection beams that rebound your shots, and caravans of camels (Llamas?). When you get hit you explode in a multicoloured shower of sparks with equally impressive sound effects.

The instruction card is very good, setting the scene for the game and giving a detailed explanation of the scoring etc.

L.C.
Instructions
Playability
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SOFTWARE REVIEWS

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VIC-20 PROGRAM

Steer with care or you won’t last

Your orders are to clear the dud mines... avoiding the live ones. Stephen Saxon briefs you on your mission for the unexpanded VIC-20

The game is set in the future where you have to steer a ship through a minefield. You have a limited number of lives and must clear the dud mines while avoiding the live ones.

The program uses multiple colour graphics and Commodore's standard character instructions to create a realistic mission scenario.

Hints on converting
- If you convert this program, bear in mind that the screensize of the VIC-20 is 22x23 and that VIC commands are different to the VIC-20 characters.
- The PEEK/POKE are 7680-8191 screen locations plus 9720-9747 for colour locations.
- 5879 screen and border colors.
- 11554 sets lower case and 11654 sets upper case.

```vic-20
10 PRINT "YOUR MISSION FOR THE UNEXPANDED VIC-20"
20 PRINT "INSTRUCTIONS ARE GIVEN IN THE PROGRAM, WRITTEN FOR THE UNEXPANDED VIC-20"
30 PRINT "SCORING IS DONE IN TWO WAYS:")
40 PRINT "1. POINTS ARE AWARDED FOR CLEARING EACH "
50 PRINT "MINE*")
60 PRINT "2. POINTS ARE AWARDED FOR CLEARING EACH "
70 PRINT "MINE*"
80 PRINT "THE OBJECT OF THIS GAME IS TO CLEAR"
90 PRINT "THE MINEFIELD OF DUD MINES WHILE AVOIDING"
100 PRINT "THE LIVE MINES (*)")
110 PRINT "THE CONTROLS ARE AS FOLLOWS:")
120 PRINT "UP = "
130 PRINT "DOWN = "
140 PRINT "LEFT = "
150 PRINT "RIGHT = "
160 PRINT "YOU HAVE 15 LIVES...")
170 PRINT "YOU WIN IF YOU CLEAR ALL THE MINES"
180 PRINT "YOU LOSE IF YOU TOUCH A LIVE MINE"
190 PRINT "YOU LOSE IF YOU RUN OUT OF LIVES"
200 PRINT "HAVE FUN!"
210 END
```

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SOFTWARE REVIEWS

Software off the beaten track

Read our reviewers' ratings of these five programs, which reveal some unexpected uses for your micro

Cocktails
48K Sharp
MZ-BOK £5.50

Epson, 25 Chartwell Place, off Downs Road, Epsom, Surrey

Here's a little gem for the hippies amongst us! The program has 102 different cocktails—imagine, you have to get through 102 recipes before you start to repeat yourself! Enter the contents of your drinks cabinet and after going in to a town, the computer will list the cocktails you can make from your stock of drinks.

A second option gives an alphabetical list of all 102 recipes. Browse through the list using 99 keys to call the next page, and then enter the number of the cocktail you want to make. The computer will list the recipe of your choice.

The program is supplied on cassette complete with a clear and well written set of User Notes. All special reports are available, and the user can choose to print a menu of cocktails for future reference.

The Cocktails program is a must for the cocktail lover.

Stock Control
48K Sharp
MZ-BOK £5.50

Epson, 25 Chartwell Place, off Downs Road, Epsom, Surrey

This utility program for the MZ-BOK is designed for the stock control of the contents of a domestic deep freezer. Supplied on cassette, it comes with four sheets of user notes.

For each stock item the program records item number, description, unit of measure, stock level, maximum acceptable stock level, stock value price, date of last receipt, and date of last issue. There is also a field for notes.

The various reports available are: any of which may be sent to a printer if required. The program will list by stock type or generate a total stock value. An extra three special reports are available: stock moving report, minimum stock report, and cost stock report. You can print out each program section by a menu, and HELP key is provided.

Considering the application, the program could be improved in overall, but for a good, reasonably fast stock control program, this fits the bill nicely.

As the program is written, a minimum of 256 bytes may be needed on file. With a 48K machine this could be stretched to 272 items. A minimum of 30 bytes will be needed on disk. If the program will run slower.

One among many minor bugs is that the N INPUT for wrong date is not accepted as it stands. A simple mod would correct this.

In summary, the program is well written, and the user interface is easy to use. It is a useful program for anyone who needs to keep track of their stock levels.

Learn to play guitar
Spectrum £6.00

Laverspond Site, Bankford Lane, Long Ditton, London, SM8 1DL

If you want to learn to play the classical guitar, this is not the program for you. It is a program for beginners who want to learn the basics of guitar playing. The program is designed for those who want to learn to play the guitar from scratch, and it covers all the essential techniques and skills required for playing the guitar.

The program is easy to use, and the instructions are clear and easy to follow. The lessons are structured in a logical way, and the user can progress at their own pace.

The program also includes a variety of exercises and practice songs to help the user improve their skills. Overall, this is an excellent program for anyone who wants to learn to play the classical guitar.

Pools
48K Spectrum £20 plus

Football Enquiries, Anon 9 New Road, Haverfordwest, Pembrokeshire SA61 1TT

Pools apparently calculates probable draws on past performance, selecting 22 matches for entry as 'Zero' points at 300 or 3600 levels. Instrutions, thankfully, avoid rambling and contradiction, and there was a helpful list of some options on the main menu. Every week, you must input number-coded details of all matches in the league and all results — very carefully, because there is no error trap function. 'Zero' points are all full points — eight score-draws can come up without warning. Complete a stake of 25p seems impractical and the suggested 45p or 11.80 presumably applies to a 'low dividend' Luton draw. Must reach E6 or £24

Everyone gets the same selection set of shared dividends could be published, but you are committed to spend the author £35 if three first dividends come up.

Facility for the Australian pools testing must await the start of the UK soccer season but using an old option it reached dividends draws and two non-score draws. You won't do better than

Cycle Planner/Growth Tracker
48K Spectrum £7.25

Medidata PO Box 25, London NW3 9RJ

It is unusual to find one, let alone two, programs which actually have genuine practical value at home. Designed primarily for use by women, these two could be of educational value for the whole family.

'Cycle planner' starts by providing you with some useful facts about the female menstrual cycle, then enables you to enter a calculator routine which allows you to calculate procreative dates of maximum fertility, including the time of greatest risk, and the date of birth of a child if conception occurs.

If the cycle is irregular, the dates

of the first day of at least the last three cycles have to be entered to estimate future dates. There is no way of storing any data, so this information has to be re-entered each time the program is used.

Another minor criticism is the lack of error trapping when a numeric input is requested. 'Growths tracker' is valuable base for extracting information on the growth of a foetus before birth development of a child (up to 24 months) after birth, and information on five of the most common childhood diseases. There is also a facility to enter individual details.

This cassette certainly won't be sold in the same numbers as space games, which is a pity, for it is much more useful and educational than average.

Instructions: ease of use 80% display 80% value for money 60%

Recommended: Recommended.
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Sirsar User June 1983

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Page 24
What's the score? Over to you and your computer

Don't be stumped for the latest score. Simon Edwards' SuperScore program for the 48K Spectrum will bowl them over at the local cricket club. Or you could try to catch out TV's computer.

The program can be used to keep a record of the score when listening to the cricket on the radio. You could try and outperform the Honeywell computer used on TV, if you have a spare set. I also use SuperScore to keep a record of the game of Howzat.

Alternatively you could take your computer to your local cricket club to impress them with your electronic wizardry.

The program can be SAVED in mid-game (use command S) which will also save all the variables. To make a copy of the program without variables (type V) when the scoreboard is displayed.

With each game you will be asked whether you wish to count each ball. If you reply Y then you must type O when no runs are scored from a ball. If you reply N then you must remember to type 0 at the end of each over. When the program appears remember to press the correct key for each. After you have typed the required information,

At last the cricket score book can be made redundant. SuperScore is a cricket scoring program for the 48K Spectrum.

A scoreboard is displayed. Input is by single letters or numbers using INKEYS. Information on each innings is retained and can be viewed.

A list of all instructions is included in the program. The program can score in any limited or full innings, or two innings, with three POKEs used to:

- Simple functions
- POKE K609..W
- POKE 13658.6

Don't be stumped for the latest score. Simon Edwards' SuperScore program for the 48K Spectrum will bowl them over at the local cricket club. Or you could try to catch out TV's computer.

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SPECTRUM PROGRAM

420 LET a(t,b,s) = t*(t,b,s) ; 429 LET a(t,b,s) = t*(t,b,s) + 10
430 LET b(t,b,s) = b(t,b,s) ; 431 LET b(t,b,s) = b(t,b,s) + 10
432 LET s(t,b,s) = s(t,b,s) ; 433 LET s(t,b,s) = s(t,b,s) + 10
434 IF a(t,b,s) THEN PRINT AT z, v + t, s + w + v
435 IF b(t,b,s) THEN PRINT AT z, v + t, s + w + w
436 IF s(t,b,s) THEN PRINT AT z, v + t, s + w + w + w
437 LET a(t,b,s) = a(t,b,s) + 10
438 LET b(t,b,s) = b(t,b,s) + 10
439 LET s(t,b,s) = s(t,b,s) + 10
440 NEXT t, b, s

100 LET a = 0 : b = 0 : s = 0 : GOSUB 1000
101 LET a = 0 : b = 0 : s = 0 : GOSUB 1000

1020 LET c(t,b,s) = c(t,b,s) + 10
1021 LET c(t,b,s) = c(t,b,s) + 10
1022 LET c(t,b,s) = c(t,b,s) + 10
1023 IF c(t,b,s) THEN PRINT AT z, v + t, s + w + w
1024 IF c(t,b,s) THEN PRINT AT z, v + t, s + w + w + w
1025 IF c(t,b,s) THEN PRINT AT z, v + t, s + w + w + w + w
1026 LET c(t,b,s) = c(t,b,s) + 10
1027 LET c(t,b,s) = c(t,b,s) + 10
1028 LET c(t,b,s) = c(t,b,s) + 10
1029 NEXT t, b, s

1300 LET a(t,b,s) = a(t,b,s) + 10
1301 LET b(t,b,s) = b(t,b,s) + 10
1302 LET s(t,b,s) = s(t,b,s) + 10
1303 IF a(t,b,s) THEN PRINT AT z, v + t, s + w + w
1304 IF b(t,b,s) THEN PRINT AT z, v + t, s + w + w + w
1305 IF s(t,b,s) THEN PRINT AT z, v + t, s + w + w + w + w
1306 LET a(t,b,s) = a(t,b,s) + 10
1307 LET b(t,b,s) = b(t,b,s) + 10
1308 LET s(t,b,s) = s(t,b,s) + 10
1309 NEXT t, b, s

39% PRINT AT v + z, "Tipe A if the year or the runs exceed 99.
392% INPUT "No. of runs scored? ": n
393 LET t = 1*10: LET b = v + z: LET s = w + w: PRINT AT z, v + t, s + w + w
394 IF n = 0 THEN GOTO 390
395 IF n THEN GOTO 392
396 NEXT t, b, s

1980 LET a(t,b,s) = a(t,b,s) + 10
1981 LET b(t,b,s) = b(t,b,s) + 10
1982 LET s(t,b,s) = s(t,b,s) + 10
1983 IF a(t,b,s) THEN PRINT AT z, v + t, s + w + w
1984 IF b(t,b,s) THEN PRINT AT z, v + t, s + w + w + w
1985 IF s(t,b,s) THEN PRINT AT z, v + t, s + w + w + w + w
1986 LET a(t,b,s) = a(t,b,s) + 10
1987 LET b(t,b,s) = b(t,b,s) + 10
1988 LET s(t,b,s) = s(t,b,s) + 10
1989 NEXT t, b, s

2080 LET a(t,b,s) = a(t,b,s) + 10
2081 LET b(t,b,s) = b(t,b,s) + 10
2082 LET s(t,b,s) = s(t,b,s) + 10
2083 IF a(t,b,s) THEN PRINT AT z, v + t, s + w + w
2084 IF b(t,b,s) THEN PRINT AT z, v + t, s + w + w + w
2085 IF s(t,b,s) THEN PRINT AT z, v + t, s + w + w + w + w
2086 LET a(t,b,s) = a(t,b,s) + 10
2087 LET b(t,b,s) = b(t,b,s) + 10
2088 LET s(t,b,s) = s(t,b,s) + 10
2089 NEXT t, b, s

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THE BEST GAMES FOR YOUR 64 STIX & CRAZY KONG £8

OTHER ARCADE GAMES FOR THE 64 INCLUDE TANK ATAK, MANGROVE AND KAKTUS (£8) WE HAVE 2 FANTASY GAMES, LORD OF THE BALROGS (£6) AND HALLS OF DEATH (£8), AND A SUPERB MACHINE CODE, ADVENTURE GOBLIN TOWERS AT £12

SUPERSOFT

Winchester House, Canning Road, Wealdstone, Harrow, Middlesex, HA3 7SJ
Telephone: 01-861 1166
We go into the ATARI's ANTIC chip with Marc Freebury to find out how to flip pages and use fine scrolling.

The slight flicker in this can be worked out in machine code. Horizontal fine-scrolling has the added problem that the lines on the screen are contiguous memory locations, so if you scroll one in the middle alone, what comes out is the "edge." The answer is that the characters from the line above/below come on to fill the gap, as a result the whole screen gets thrown out of line.

This can be demonstrated by changing the 34 in line 20 to a 90. We can see then both horizontal and vertical fine-scrolling. Register Horizontal Scroll at location 54276 controls the amount.

To correct the displacement problem, screen data must be arranged and retrieved in lines of greater width than one normal line. So, to do this, we POKE location 559, register DMACTL with 35. This means that ANTIC will now pull 48 locations per line instead of 40.

It also means that you will have to organise your information accordingly. Now the rough edges are not displayed on screen and scrolling in both directions appears smooth.

For the best example of fine-scrolling, try getting a look at Eastern From 1941 from the ATARI Program Exchange.
SOFTWARE REVIEWS

What’s new in programmed learning?

Our review panel gives marks out of a hundred to a selection of software for learning at home and at school.

Punchman

1 and 2
BBC 32K £7.95
Chalksoft, Lowwood Cottage, Tonewalde Wellington Somerset

This review looks at the classic game, Punchman, which involves using a panel to move an animated character across a grid, trying to avoid obstacles and collect coins. The game is simple but addictive, with each level adding more complexity.

abc lift off

Spectrum

£7.95
Longman/Micromega, Longman House, Burnt Mill, Harlow, Essex CM20 2JE

A new early learner program

There are two parts to this program and you can choose which you require.

First is the alphabet, the letter A and an apple are displayed top left and in the bottom right corner, for a drawing of an apple is shown.

By pressing the next letter (B), a new picture (an biscuit) is drawn and the name written up. This continues throughout the alphabet.

The second section is a little game. A rocket is drawn then three stars below it which move up beneath the contents are revealed and a world is displayed.

Pressing at this point adds the octopus to the stage, but not the letter B and on the right corner, the rocket is still there. The game is simple but engaging.

Facemaker

BBC 32K £9.95
Ask London House, 68 Upper Richmond Road, London SW15

This has to be the most surprising educational program I have seen.

The idea is to build up faces on the screen by answering questions about the features and setting up the product of your answers appear.

The questions cover such things as eyes, hair, mouth, ears, nose and some alternatives are given. It is a small, but large for people.

My first criticism is that there are no enough alternatives in some cases like ear size, so you have to make up yourself.

There are also no alternatives for age or colour, but in some ways it would not really be of great value in multi-ethnic schools.

Hide & Seek

BBC 32K £9.95
Ask London House, 68 Upper Richmond Road, London SW15

Based on the old familiar games of Hide & Seek, Findaman and Kim's Game, this program's overall aim is memory training, and it succeeds very well indeed.

There are three games, usually with more than one difficulty level so the program will span a large age range.

Besides being useful as a simple player game I would suggest that it would be a good game for a small group of children to encourage communication and discussion skills. The input is recorded from single key presses to spell complete words but the error trapping is such that it is very difficult to crash the program accidentally.

The most outstanding feature of the program is the number of characters and variety of the graphic shapes presented. They are just the right size and are very easily recognizable. The instructions are to the high standard that the company usually presents.

I would however suggest you use command EXE before loading as this will stop the initial sound effects from driving you mad.

Tele-Tutor 1

Dragan £25
Microdeal, 14 Truro Road, St. Austell, Cornwall PL25 5JE

This package contains two games with four items an oral spelling test, a multiple choice vocabulary quiz, a math drill and Estimate, to help improve mental arithmetic. An A+ hardback ring binder contains all the information needed to load and use the programs.

The package is designed for children aged five to ten. An ambitious claim, yet one that is achieved by allowing you to input data on two of the programs - spelling and word drill.

The two math programs offer different level skills that adjust as the work progresses and up to five or six pupils may work at the same time.

All the results are shown at the end and in one case a high return. The success rate is formed at the correct answers are given. A mode is particularly for schools is the option to print results.

I found the spelling and vocabulary work too slow for general classroom use. Having my own data in it would be between ten and fifteen minutes per child. Good at home however allowing reinforcement of school work.

The maths work, by contrast was very good at school.

There's a lot of potential for this sort of package and it is great for the Dragon's future as a school based computer.

Instructions: 60% value for money: 70%
Will you survive to reach the underwater city?

Take up the challenge of Clive Wright's game for the Commodore 64. It's addictive and makes good use of sprites and graphics.

**How it works**

100-123 set up user-defined graphics
135-151 set up sound
145-151 set up sprite
215-220 print title, logo, controls
210-216 input level of play, call main
230-233 set up paper colour etc
underwater done effect
236-286 prim loop, including
286-288 work out and print
rock string and tuned
296-309 work out whether to move caverns left/right
600-611 city reached, graphics
610-611 three sprite, sound
2000-2001 no three sprite, sound
3000-3001 reverting game off
3000-3001 reverting game on
4000-4000 ship is lost & input
4000-4015 damage counter
7000-7000 lose/game over round
5055-5055 win/game over round
9000-9058 edge of caverns
random user-defined graphics
5000-5000 edit data

**Hints on conversion**

Unfortunately you're a bit stuck unless your computer has sprites like the 64. For example, the Amstrad 400 or 800 or the Storit MS. So I don't suggest that anyone with a home video machine tries to convert this program.

- Clive Wright is with AC Computers, who have brought us an extended BASIL for the Commodore 64. It's called IC BASIC, and for £15.95 on tape, adds 90 new commands. For details including a detailed discussion of IC BASIC, commands send an SASE to AC Computers, 28 Askerfield Avenue, Altrincham, Dandy DE3 2SU.

**Variables**

- general purpose loop
- WL width, decided by level of play
- RT rate at which caverns narrow
- H damage
- width of cavern
- N sprite data
- S start of opening in cavern
- T keep track of clock
- E end of opening in cavern
- WAS string for creating wall
- EPS string for creating spaces
- RKS cavern rock formation
- LH left/right hand portion
- X determines keypresses
- M number of minutes
- number of seconds
- total number of seconds
- random variable for cavern edge formation

Resistance to damage and can sustain a scrape. At the end you will be given the time for your journey, whether or not it was successful.

If you find it too easy, I suggest you change H = 16 in line 230 to a lower number, perhaps 15 or 8.

Most earlier versions of this game have been rather non-addictive and had the problem that when the background scrolled the ship did too - much too the annoyance of the player.

But with the 64 the sprites are totally independent of the background. Yet they can still detect collisions with, in this case, the rocks.

In addition, the 64 has much better sound, that the average micro and good use can be made of user-defined graphics.
Top Ten programs for the Spectrum

1. Flight Simulation
2. Jet Pac
3. Mad Martha
4. Transylvanian Tower
5. Super Spy
6. Horace and the Spiders
7. Maniac Mites
8. Test Match
9. Arcadia
10. Scrabble

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

Top Ten programs for the Dragon 32

1. Space War
2. The King
3. Android Attack
4. Nightflight
5. Froger
6. Planet Invasion
7. Cuthbert Goes Walkabout
8. Champions
9. Dragon Trek
10. Space Shuttle Simulator

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

Top Ten programs for the ZX81

1. Space Raiders
2. Espionage Island
3. Football Manager
4. Flight Simulation
5. 1K Games
6. 1K Chess
7. Defender
8. Scramble
9. Planet of Death
10. Fantasy Games

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

Top Ten programs for the VIC-20

1. Arcadia
2. Wacky Waiters
3. Panzo
4. Cosmids
5. Catcha Snatcha
6. Escape MCP
7. Cydons
8. Gunrunner
9. Laser Zone
10. English Invaders

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

U.S. SCENE

Taking the worry out of buying

Let's start this week with a prediction of the future of home computing by certain respected members of the profession. First of all, Clem Smith, research director of the well-known Yankee Group. In Mr. Smith's opinion, from five to eight million computers will be sold this year there. He also predicts that even before there will be many computers in each household just like there are radios now.

Some of his other predictions: home computers will be much more commonplace, used as communication terminals when 2000 baud modems that cost less than $100 become available in quantity that word of mouth will become the primary criteria for program buying. That home computers will be placed in one of three categories: novices, 16K or professional 64K, that there will be at least 500,000 computer dealers in the U.S. by the end of this year and that dealers will begin to specialize their offerings to one or two lines.

Dan Ross, of Times Corp., which markets their versions of the Spectrum and ZX81, looks for personal computerists software products to really take off in sales, and to have pressure to stick with the competitive emphasis shifting to value and features.

Many other leaders agreed that obsolence of customer's equipment should be minimized, more emphasis should be placed on after-purchase support, and that sales support should feature in depth product availability.

It would certainly be nice for those predictions to come true if anything else, a little stability in the marketplace would be nice. There are many consumers who are afraid to buy the most cost effective product, regardless of whether it is hardware or software, for fear that it may not be around in a year or two. Then they just want to end up with a very expensive paperweight or dust collector.

I realize that there are some available software or hardware for the Tandy Color Computer. I can say that I am biased against the machine. It is just that I have never seen them advertised or written about for it at all.

Here is the rare exception. Super "Color" Winter II, version 3.0, has just been made available. This little software package is a word processor offering eight high resolution, wide displays having true descenders. It also offers 64K of memory and the ROM-based version to a 64K computer or 51K using the disk or tape version.

Many features in this word processor include: lowercase, line numbers, block moves, various delete functions, and full cursor control. The program allows you to automatically justify print lines, use special mail directives, perform underlining, include headers and footnotes, and pause between single sheet feeds. It also allows you to view a reproduction of the finished copy on the screen before printing it.

Using special horizontal scrolling techniques, you can create and edit pages totaling up to 400 columns per line. There are preprogrammed functions that will allow you, automatically include standard phrases, edit and create columns, link text files, and other features.

Printing commands can be placed anywhere in the text to control the printed output on the fly. All versions include the necessary commands to save and load files to tape while the disk version includes the means up to three disk operating system commands that the Color Computer will support.

The tape and disk versions use at least 2K and cost about $200 and $100 respectively. The ROM-based version requires a 64K machine and costs about $50. For further details contact the manufacturer, SoftLink Corporation, 9072 Lindale Avenue South, Minneapolis, Minnesota 55420. This seems like a very good product for the price.

That's it for this week.

John Hagen  Fairfield, California
Frogger
TRS-80
Models I and III £14

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

This game is also available on disc for an extra £2. Both versions are joystick compatible, and can provide sound through an appropriate amplifier.

There's a standard road and river scenario, with the added graphics of crocodiles and snakes, and another, more challenging version, with more objects to dodge and a faster pace.

The producers have done their best to make the most of the TRS-80's limited graphics, and have provided a humorous soundtrack. It's a real pity that the machine doesn't allow colour. The screen is very crowded, and it does take a while to recognize some of the objects.

Having said that, I enjoyed the game, and found it much more playable once I had got used to the scenery and positions of the objects, rather than the crocodiles and snakes.

The trouble is, it contains some bugs. Strange things sometimes occur when you are three quarters of the way across the screen. You may lose a life or reappear in an odd place! Before buying the game I would advise you to check that these bugs have been ironed out.

The keyboard or joystick can be used to play the game — the keys are sensibly placed.

D.R.

Croaker
BBC B £7.95

Program Power, 8/8a Regent Street, Chapel Allerton, Leeds LS7 4PE

This is Program Power's version of the amphibian arcade classic, which places you in control of a somewhat mishapen frog.

Points are awarded for each successful move and for each frog delivered safely home. Bonus points are awarded for swift completion of each phase, when a family of six frogs are all home. Each phase becomes progressively more difficult.

The game is well presented with concise instructions on the cassette insert. The instructions are also included within the program. Use of graphics and sound is excellent. Most pleasing is the ability to be able to switch off the background music. I found one small bug in that the escape key does not appear to be fully error trapped. Try it and see.

J.W.

Super Frog Kti 99/4A (Extended Basic) £15

By Norton Software, from Stainless Software, 10 Altstone Road, Stockport

The game begins with the question: Do you want to play the Advanced game? If you answer Yes, you are asked for the password. Of course you don't know unless you got it by playing sufficiently well at the non-advanced game.

The latter is slow to start, but the graphics are quite good and colourful. You guide your frog across a busy road, followed by splash-free guidance across a river via logs, branches, etc. The occasional crocodile may be thrown in for good measure.

Time is a factor, displayed via a shortening red line, while you attempt to steer your frog across the opposite river bank.

Have you four 'lives' and once you get the hang of it, it can be quite fun.

P.B.

Leapfrog
TI-99/4A (Extended Basic) £5.99

Saturn Software, 39 River Park, Marriott, Wilsley

The tape contains two versions, one for keyboard and one for joysticks. The colourfull graphics and sound effects were good, making extensive use of Expanded Basic's spare facilities.

The game itself was unfortunately a little limited in scope, missing several features found on other versions. Still, with a price tag of £5.99, it can be considered value for money.

V.A.

Frogger 64
Commodore
64 £7

Interceptor Micro, Lindon House, The Green, Tadley, Hants

Apart from frogs, road, and river complete with logs and turtles, other objects on the screen are alligators, worms, crocodiles, lady frogs and flies. The graphics for all of these are of an extremely high standard. It would have been better, however, if the frogs moved smoothly rather than flashing from one place to another.

The game is potentially a winner. The trouble is that it contains some bugs. Strange things sometimes occur when you are three quarters of the way across the screen. You may lose a life or reappear in an odd place!

Before buying the game I would advise you to check that these bugs have been ironed out.

The keyboard or joystick can be used to play the game — the keys are sensibly placed.

R.I.
In my previous article I demonstrated how multi-coloured displays may be obtained on the ORIC in TEXT mode.

Many of the principles described in that article can be applied to Oric's HIRES mode, but there are a number of differences. So, although this article aims to show how high resolution colour displays can be obtained on the Oric, I'll start by re-capping on the principles developed last time.

The Oric display file in TEXT mode contains a mixture of characters and attributes. The file is located between 40000 and 49119 on the 48K Oric, and 15232 and 16351 in the 16K version.

The lower address corresponds to the top left screen position, the higher to the bottom right position. Each byte corresponds to one character square of the screen display of 25 rows by 40 characters. The top left character of each row are the attributes for PAPER and INK. Attributes have byte values between 0 and 255.

By changing the value of the row, one can either select characters (byte values between 32 and 127, and 160 and 255), or modify attributes. The first two attributes in the row are defined as foreground and background colors for the whole row, unless, in progressing row across the screen, another attribute is encountered. At this point the previous row of attributes is discarded. Attributes appear as spaces on the screen.

The display file in HIRES mode is much larger than in TEXT, extending from 40960 to 49119 (48K), or 8192 to 16351 (16K).

The major part of the display (40960-48599) is devoted to the high resolution chart, while 120 bytes (40960-40979) are used for the top three rows of TEXT style display at the bottom of the screen.

To demonstrate how the display file is arranged, type in the following short routine, and run:

```
10 HIRES
20 FOR I = 40970 TO 40999
30 POKE I, 0 PRINT
40 NEXTI
```

As the value 60 is POKE'D sequentially into the display file, the address to which the value is placed is printed on the TEXT portion of the screen.

The demonstration should show two things. One byte in HIRES mode stores the four digits for one row of six dots. And, the display file starts at the top left of the screen, and works its way across, after 40 bytes (or 40 x 6 = 240 dots), the next byte (41000) starts on the left of the second row, and so on down the screen.

Like TEXT mode, the global INK and PAPER colours are stored as attributes on the display file, unless you want a white on black display.

```
10 HIRES
20 FOR I = 40970 TO 40999
30 POKE I, 0 PRINT
40 NEXTI
```

You should get rows of colour on the screen. Type PAPER 4, and you'll get just one block of colour. Add the line

```
35 POKE 40,N1
```

and run again. You get the same block of colour, but the colours change half way along the row. Line 30 POKEs the background colour attributes down the left hand side of the screen.

This defines the colour for the whole row (without line 35). With line 35, more attributes are placed along each row. These redefine the colour of the right of the attribute. The PAPER command will alter the attributes in the first column, but not those preceded by line 35.

The FILL command can be used instead of POKE. FILL effectively POKE's a number into a specified block of bytes. The top left position in the block used by FILL is the cursor position. This command is:

```
10 HIRES
20 FILL 40,10,60,1
```

This will fill a block of 10 columns across, and 20 rows down, with the dot pattern appropriate to the value 60. The block is positioned at the top left of the screen, as the cursor starts at this position. Add a line

```
13 CURSET 20,20,0
```

and RUN again. Now the filled block has moved away from the cursor position. The top right most pixel of the block used by FILL is at the cursor position.

Note that after FILL, the cursor position is in the byte immediately below the bottom left hand corner of the block filled. FILL can be used with attributes in the same way, but you should only define FILL one byte, or one column of bytes, as you would use PAPER. Use a FATT with N, as the number of columns to be filled.

When you have an attribute on a line, the space appears as a blank. If you use the commands DRAW or CIRCLE, and the line goes through the attribute, then nothing will appear on the screen at the attribute position.

For example:

```
10 HIRES
20 CURSET 10,10
30 POKE 41020,20
40 DRAW 200,10
```

Note that, should the DRAW command go through any attributes, your program may stop with a system error message.

One final tip for HIRES mode. The command 'CLS' will only work on the TEXT portion of the screen. To clear the screen use HIRES again.

Table 1 - calculation of the value for dot patterns in HIRES mode.

<table>
<thead>
<tr>
<th>32</th>
<th>16</th>
<th>8</th>
<th>4</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

Add up the numbers associated with the hexes (dots) that you want switched on, then add 64 (number range 64-127). Note, you can use numbers between 32 and 63, but the left most dot will always be on.

<table>
<thead>
<tr>
<th>Colour</th>
<th>light</th>
<th>background</th>
</tr>
</thead>
<tbody>
<tr>
<td>black</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>red</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>green</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>yellow</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>blue</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>purple</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>cyan</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>white</td>
<td>7</td>
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Page 36  HOME COMPUTING WEEKLY 23 August 1983
Find words you never knew existed

See what your computer can do with words. Bryn Phillips wrote Anagram for the unexpanded VIC-20, but it will easily convert to other micros

Variables

<table>
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<tr>
<th>LT(h)</th>
<th>characters in word(s)</th>
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</thead>
<tbody>
<tr>
<td>DIR</td>
<td>order of characters in anagram</td>
</tr>
<tr>
<td>SSD</td>
<td>specified characters in anagram</td>
</tr>
<tr>
<td>PDD</td>
<td>position of specified characters</td>
</tr>
<tr>
<td>ANARG</td>
<td>array to check the characters in anagram match characters in word</td>
</tr>
<tr>
<td>NLI</td>
<td>number of letters in word</td>
</tr>
<tr>
<td>LPPD</td>
<td>characters in specified anagram</td>
</tr>
</tbody>
</table>

Impress your friends, offend your enemies. Just let your program loose on their names and it will generate several good — or nasty — anagrams.

It could also be used for semi-serious applications such as Scrabble, crosswords and communications.

Type it into an unexpanded VIC-20 and the title 'Anagram' appears, and it randomly rearranges until C is pressed. You are then asked to enter your word/s, which can be up to 20 characters long.

The program recognizes spaces as characters and it's a good idea to include some spaces as this tends to generate the best anagrams.

Now sit back, watch the screen and let imagination hit you. The computer does the work and it's far easier than fiddling with Scrabble tiles.

If you see a letter grouping, type it back to you press S. You can then enter this grouping anywhere in the anagram and the computer will build round it.

When you have an anagram you like, you can SAVE it, plus 14 more. When you have finished, terminate the program and the computer will list your chosen anagrams.

I have written the program in 'no frills' BASIC, avoiding FEEKs and POKEs, to allow easy conversion. It will also run on Commodore PET.

How it works

15-34 display title
160-200 break up word into characters
210-350 create anagram by random arrangement of all unspecified characters
360-400 print anagram and allow characters to be typed
410-520 subroutine to allow part of anagram to be typed
530-1550 subroutine to print options
560-2140 subroutine to SAVE anagram and to list selected anagrams to date

Hints on conversion

Few problems would be expected in converting this program to run on other micros BASIC. Considerable use has been made of the cursor controls in the PRINT statements, and in converting the program some effort would be required to achieve a satisfactory screen format.

There may also be differences in some of the string handling commands, but otherwise conversion should be straightforward.

Listing

```
1000 DATA "\"" """
1010 DATA "\"" """
1020 DATA "\"" """
1030 DATA "\"" """
1040 DATA "\"" """
1050 DATA "\"" """
1060 DATA "\"" """
1070 DATA "\"" """
1080 DATA "\"" """
1090 DATA "\"" """
1100 DATA "\"" """
1110 DATA "\"" """
1120 DATA "\"" """
1130 DATA "\"" """
1140 DATA "\"" """
1150 DATA "\"" """
```

HOME COMPUTING WEEKLY 23 August 1983  Page 37
Have you got what it takes to face the giant spiders?

If you can't stand spiders you'll hate the man-eaters in this Spectrum program by Clyde Bish. Why not grit your teeth and type it in?

Variables
p = position of man
x,y = position of spiders
s = score (how many moves you manage)
s = spider death counter
a,d = difficulty level

Spectrum Program

How it works:
1-8 set graphics, real console and score, set difficulty level
2-5 input and move man
6-10 move spiders relative to man's new position, check spiders reach man, fall into pond
11-13 end and game continue
14-16 print text of play
17-19 dimension arrays, set man's start position to centre screen
180-210 print points
210-218 set up spider positions
220-236 clear man
240-275 print man in start position

Nests on conversion
ZX81 users should replace the user defined graphics with available symbols e.g. adding a pond etc., and use the DFCC's variables to control the code of the chosen symbols

To help users, other BASICs include the INK/PAPER colours are 0 black, 1 blue, 2 green, 3 cyan

The key to the spiders' tracking ability is contained in the lines 110-140

Page 38  HOME COMPUTING WEEKLY 23 August 1983
Inside...
The New ZX Microdrive!
Latest software...
Latest prices...
The ZX Microdrive—and more!

For some lime now, the new ZX Microdrive has been the subject of much discussion. Which is only to be expected, when the object of everyone's anticipation is completely new to the world of computing.

Microdrive provides high-speed access to truly massive storage. With just one Microdrive, you'll have at least 85K bytes of storage, and the ability to LOAD and SAVE in mere seconds. Yet the ZX Microdrive is about the size of a Spectrum mains adaptor, and costs less than £50!

First stocks are now in. Microdrives will be released on an order of priority basis. Spectrum owners who purchased by mail order, direct from us, will be sent full details including how to order, in a series of mailings that begins with the earliest names on our list.

And if you didn't buy by mail order?

Don't worry — for a colour brochure with full information on Microdrives, including how to order, just send us your name and address (use the coupon at the back of this issue of Sinclair Special). But remember, the sooner you send us your name, the sooner you'll get on the list.

Of course, there's much more to Sinclair than Microdrives, as you'll see on these pages. The latest releases of Spectrum and ZX81 software have been amongst the most successful ever. Prices of most established Sinclair products are at their lowest ever. To buy what you want, just use the Order Form.

Until the next issue of Sinclair Special, and more good news.

PS: Come and see us — and all that's new at Sinclair — at the PCW Show, Barbican Centre, from Sept 26th to Oct 2nd. We'll be pleased to see you!

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At least 85K bytes storage, loads a typical 48K program in as little as 9 seconds: £49.95.

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Six new ways to make more of your Spectrum

Take a look at these brand new titles. Each is an outstanding new program using the full potential of the Spectrum for games with stunningly animated graphics for strategies of fiendish cunning, for masterly applications of computing capability.

Cyrus IS Chess Based on the Cyrus Program which won the 2nd European Microcomputer Chess Championship and trounced the previously unbeaten Cray Blitz machine. With 8 playing levels, cursor piece movement, replay and take-back facilities plus two player option. The 48K version has many additional features including an extensive library of chess openings. For 16K or 48K RAM Spectrum.

Horace and the Spiders Make your way with Horace to the House of Spiders, armed only with a limited supply of anti-spider bite serum. In the house destroy the webs before the spiders can repair them. Then destroy the spiders, before they destroy Horace! Undoubtedly the creepiest Horace program ever produced! For 16K or 48K RAM Spectrum.

Computer Scrabble The famous board game on-screen—with the whole board on view! A huge vocabulary of over 11,000 words. Full-size letter tiles, four skill levels—the highest of which is virtually unbeatable. For 1 to 4 players. For 48K RAM Spectrum.

Backgammon A fast, exciting program, with traditional board display, rolling dice and doubling cube. Four skill levels. For experts—or beginners (Rules are included—it's the quickest way to learn the game). For 16K or 48K RAM Spectrum.

FORTH Learn a new programming language, as simple as BASIC, but with the speed of machine code. Complete with Editor and User manual. For 48K RAM Spectrum.


Overleaf—your Sinclair order form.
These three new cassettes offer two totally different challenges to you and your ZX81. The games – like so many ZX81 games today – really do use the ZX81’s capability. The FORTH program is a fascinating extension of your own computer understanding.

**Sabotage.** Defender or attacker? The choice is yours in this exciting game. Be the guard and defend the ammunition in the compound – or be the Saboteur and attack it! Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

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Simply fill in the relevant section(s) on the order-form below. Please allow 28 days for delivery. Orders may be sent FREEPOST (no stamp required). Credit-card holders may order by phone, calling 01-200 0200, 24 hours a day. 14-day money-back option.

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<td>ZX Printer</td>
<td>1014</td>
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<td>12A Mains Adaptor for use with ZX81 computer/ZX Printer combo (only required if you have an early ZX81 with 07A Adaptor)</td>
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SOFTWARE REVIEWS

Raider of the Cursed Mine
48K Spectrum £5.50

Arcade, Technology House, 22 Church Rd, Organ- ham B80 6DG

The evil spirits that inhabit the cursed mine have been around forever to steal their diamonds. Beware of falling boulders and hogs that chase you around. Your object is to reach the exit. The graphics are good and the music is very catchy. A bonus is given which varies with the length of time you take to reach the exit.

This is an action game. Stop guessing! It's a good maze game and original at that. There's little doubt that the game is not as complex as the original, but it's still different and entertaining. The graphics are good and the music helps to keep you going. The game is worth trying.

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Escape-MCP
VIC-20 £5.99

Rabbit Software, 15 Station Rd, Harrow HA1 2DE

For some reason only one of the four copies of this game would load, which means it's a rabbit program!

This is a maze game. Stop guessing! It's a good maze game and original at that. There's little doubt that the game is not as complex as the original, but it's still different and entertaining. The graphics are good and the music helps to keep you going. The game is worth trying.

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Star Trek
Commodore 64 £7.00

Intercenter, Mocart, London W1V 5HJ

Star Trek is one of the best video games I've seen, with a space ship and environment that make you want to visit. The graphics are good, the sound effects are good, the music is good, and the gameplay is good. The only thing that could be improved is the control system, which is a bit slow.

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Hummer
House of Horror
Spectrum 48K £7

Lasersound, Stratford, London E15

This is a typical haunted house adventure game, in which you have to traverse 60 rooms on four floors to reach a monster with your hands. The display is a sequence of 3D rooms all the same except for the number of doors and the occassional trap. The game is not very long and you don't have to keep a note of your strength, which drops with moves and traps. The game is very good.

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Rattler
Attack
TI-99/4A (Extended basic) plus Joystick £10.00

Lanters, 4 Harlenden Rd, Tadworth, Surrey SM8 6QD

Forty of Star Wars will not be disappointed with the introduction to the theme of Rattler Attack. Your mission is to destroy the enemy's ships using your ship's laser. The game is not too difficult, but it's still fun. The graphics are good and the sound effects are good. The game is worth playing.

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