

# Home Computing WEEKLY

An Argus Specialist Publication

Britain's brightest weekly, packed with reviews and listings

No. 55  
Mar 27-Apr 2, 1984

40p

**Software reviews for:**  
Spectrum, BBC, Commodore 64, Dragon, Texas, Oric

**FREE**  
competition  
£1,000-worth  
of software  
from  
**K-tel**

Type in our  
BBC listing  
and fly a  
space shuttle

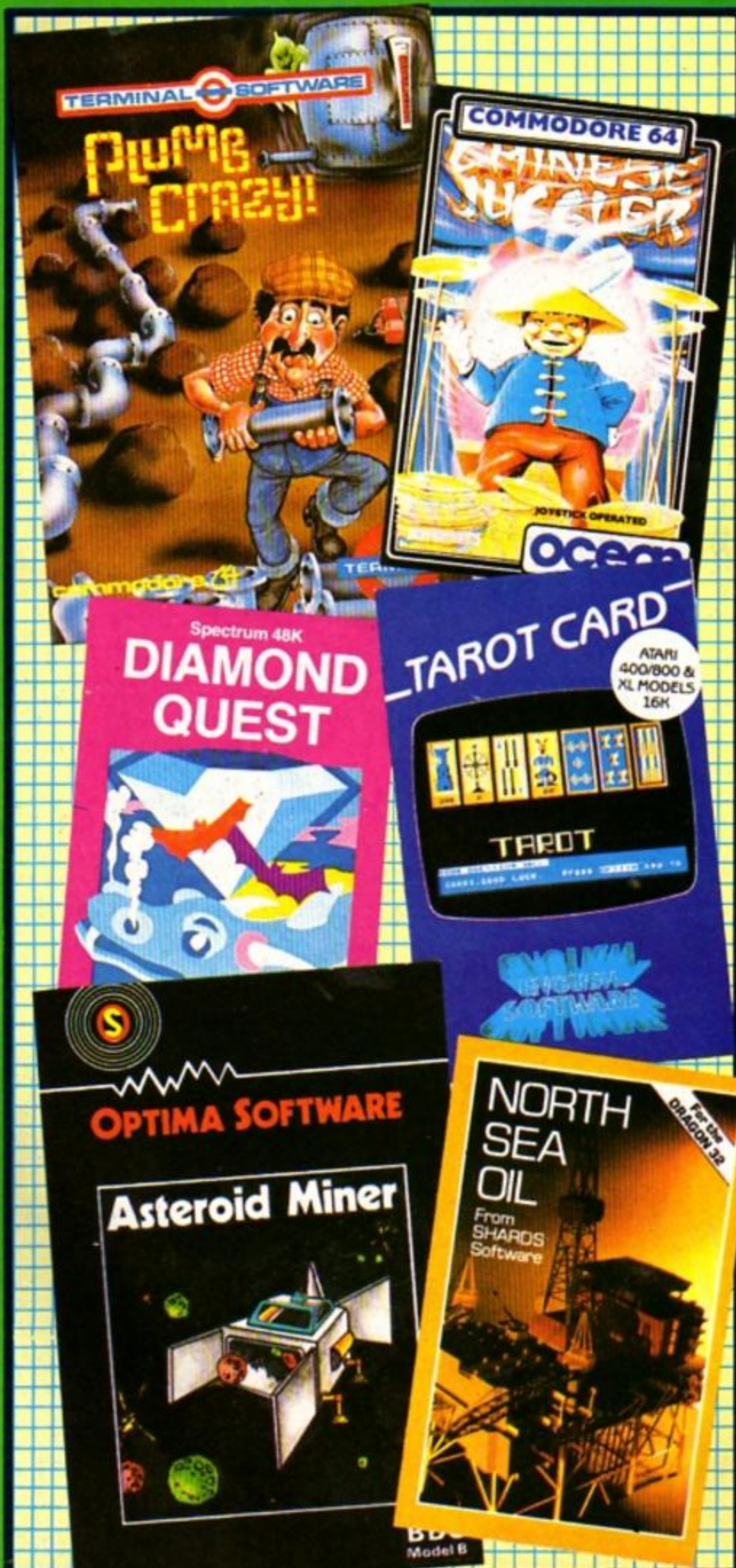
Spectrum: try  
our game and  
read about the  
secret in  
your ROM

Four listings  
for the VIC-20

Commodore 64:  
crack the code  
and draw 3D  
pictures at speed

Test your  
memory with  
our game for  
the Dragon

**AND:**  
your letters,  
news, One  
Woman's View,  
charts,  
U.S. Scene ...



## Musical Spectrums

Spectrums have joined an electronic rock group — a five-man band called Mensana.

Three of the computers are connected to keyboard synthesisers through home-made interfaces with a fourth used as a controller.

Band leader Barry Connor, a 35-year-old London bus driver, said they could now use far more sophisticated musical effects.

Up to 15 minutes of music could be stored in the Spectrums and manipulated by software written by group member and student Rupert Goodwins.

Mr Connor, who drives a No. 52 double decker between Mill Hill and Victoria, said: "It's as if you've got 10 hands up and down the keyboard. It extends what you are able to do."

"If you wanted to multi-track, for example, you would need a studio and expensive equipment. This way you don't."

"We are able to produce far more complex music, as if there were another three or four members of the band."

The sound is manipulated, or more added, using a joystick to

*Continued on page 5*

## Fourth name is final

Remember the Samurai, Elan and Flan? Now you can forget them all. The one to remember is Enterprise Computers.

It's the new name of the company which is launching two computers — 64K for £229 and a 128K model at £300 — now delayed until September.

Here's a step-by-step guide to the muddle over names:

- The first name, Samurai, was dropped because production is now taking place in the UK and not Japan and because there is a business computer of the same name, made largely by Hitachi.

- They then settled on Elan and produced paperwork, like manuals and a magazine, as well as products with that name. But it turned out to be used by several other

*Continued on page 5*

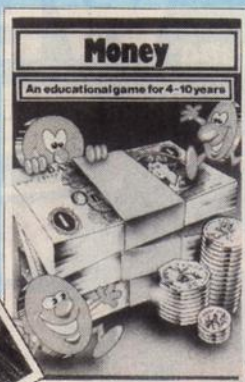


# Stell Software

— — — for top quality programs

## Make learning fun with these top quality educational games!

**Money** - an introduction to coins and notes and their use in shopping.  
4-10 yrs.  
(Spectrum 48k.)



**Missing Words** - watch the train move forward when you type in the right word.  
4-10 yrs.  
(Spectrum 48k.)



**Maths Invaders** - answer the questions correctly or the invaders will land on you.  
4-12 yrs.  
(Spectrum 16/48k, rs BBC B, Electron, & Commodore 64.)



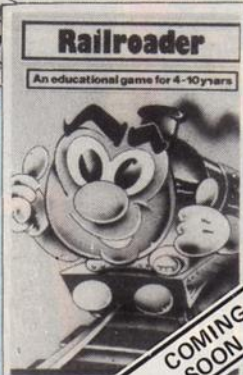
**Identikit** - choose from a range of features and build up a face on the screen.  
2-8 yrs.  
(Spectrum 48k, BBC B, Electron & Commodore 64.)



**Time** - learn to tell the time with this simple step by step guide  
3-10 yrs.  
(Spectrum 48k, BBC B, Electron.)



**Micros for Children 1**, a set of four educational games for children of 3-8 yrs. Excellent value. (Spectrum 16/48k.)



**Railroader** - lay track on the screen in any layout you want.  
4-10 yrs.  
(BBC B, Electron.)



Spectrum programs only **£6-95** BBC, Electron & Commodore 64 only **£7-95**

Ask for Stell Software at larger branches of Boots, John Menzies, and all good computer shops, where most titles are available.

In case of difficulties order direct from Stell Software.

Dealers should contact their regular distributors.

# No. 1 in Education

Stell Software Ltd, 26 Limefield Ave, Whalley, Leam, BBC 02M

**FIVERSOFT...FIVERSOFT...  
£5 Software**

HUNCHBACK ANT ATTACK  
MANIC MINER Mr WIMPEY  
ATIC ATAC ALCHEMIST  
STONKERS LUNAR JETMAN  
PL-EYED KONG  
UK's best software prices  
See next issues of How for details  
Kilroot Park, Carrickfergus  
Antrim BT38 7DD.

**Commodore rapped over ads**

Commodore has been rapped by the advertising watchdogs after 17 people complained about a shortage of peripherals.

It was by far the greatest number of complaints in the computer and software category in the latest report from the Advertising Standards Authority.

Commodore's national press advertising was headed: "What do you want, promises or peripherals?" And it went on to say: "...some computer companies don't even bother to produce a complete range of peripherals. The good news is Commodore dealers have a complete range of peripherals available now."

Details of Commodore's cassette player were included — but the complainants found it was not available at their local dealers.

Commodore said the advert was designed to highlight its full range of peripherals but that the campaign had resulted in many retailers running out of stock.

All possible steps had been taken to despatch cassette units to shops throughout the country in a bid to meet demand.

Upholding the complaints, the ASA said Commodore was at fault for running a campaign where the featured items, in these instances, were not in stock.

Commodore was requested to take greater care in future.

Acorn Computers was also told to take care following four complaints about the non-availability of its new Electron micro.

Advertisements said it was available from selected branches of W.H. Smith, Acorn stockists and by ordering on the phone.

Acorn said it had anticipated being able to meet demand but there was a shortage at the time of launch. It had withdrawn advertisements promptly, but not all could be cancelled.

A complaint against Boots was not upheld. It concerned an advertisement for a Sinclair

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**25p OFF** **DCP**  
Up to **FOUR** vouchers  
CAN BE USED FOR **DIRECT ORDERS — SEE ADS.**



Find the words and you could win a share of £1,000-worth of K-tel software. Turn to our competition page now



There are programs for all these computers in this week's issue of Home Computing Weekly. All of them have been tested for quality by our computer room staff

**Editor:** Paul Liptrot  
**Designer:** Bryan Pitchford  
**Managing Editor:** Ron Harris  
**Chief Executive:** Jim Connell

**Divisional Advertisement Manager:** Coleen Pimm  
**Advertisement Manager:** Ricky Holloway  
**Assistant Advertisement Manager:** Stuart Shield  
**Classified Advertising:** Debra Stuppel

**Argus Specialist Publications Ltd.**  
No.1 Golden Square, London W1R 3AB. 01-437 0626

Home Computing Weekly is published on Tuesdays. Distribution by Argus Press Sales and Distribution Ltd, 12-14 Paul Street, London EC2A 4JS. Printed by Alabaster Passmore & Sons, Ltd, of London and Maidstone, Kent. Design and origination by MM Design and Print, 145 Charing Cross Rd., London WC2 0EE

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## DETAILS

Level 9 Computing specialise in high, pure-text puzzle adventures with detailed scenery and a wealth of puzzles. All games have over 200 locations and a save game feature, and cost £9.90 inclusive.

### MIDDLE EARTH ADVENTURES

**1: COLOSSAL ADVENTURE.** A complete, full size version of the classic mainframe game "Adventure" with 70 bonus locations added.

### 2: ADVENTURE QUEST.

Centuries have passed since the time of Colossal Adventure and evil armies roam The Land. With cunning, you must overcome the many obstacles on the road to the Black Tower, source of their demonic power, and destroy it.

### 3: DUNGEON ADVENTURE.

The trilogy is completed by this massive adventure, set in the rich caves below the shattered Black Tower. A sense of humour is essential!

### THE FIRST SILICON DREAM ADVENTURE

**4: SNOWBALL.** The first of Pete Austin's second trilogy. The giant colony starship, Snowball 9, has been sabotaged and is heading for the sun in this giant game with 7000 locations.

### THE LORDS OF TIME SAGA

**7: LORDS OF TIME.** Our congratulations to Sue Gazzard for her super design of this new time travel adventure through the ages of world history. Chill to the ice-age, go romin' with Caesars legions, shed light on the Dark Ages, etc. etc.

# LEVEL 9 ADVENTURES

**BBC 32K COMMODORE 64 SPECTRUM 48K  
LYNX 48K NASCOM 32K ORIC 48K ATARI 32K**



Level 9 adventures are available at £9.90 from good computer shops, or mail order from us at no extra charge. Send order, or SAE for catalogue, to the address below - and please describe your micro.

## LEVEL 9 COMPUTING

Dept HCW 229 Hughenden Road, High Wycombe, Bucks HP13 5PG

## REVIEWS

"Adventures which have a fast response time, are spectacular in the amount of detail and number of locations, and are available to cassette owners... Simply smashing!" - *Soft, Sept 83*

"Colossal Adventure is included in Practical Computing's top ten games choice for 1983: 'Poetic and tough as hell.'" - *PC, Dec 83*

"To sum up, Adventure Quest is a wonderful program, fast, exciting and challenging. If you like adventures then this one is for you!" - *NILUG issue 1.3*

"Dungeon Adventure is recommended. With more than 200 locations, 700 messages and 100 objects it will tease and delight!"

- *Educational Computing, Nov 83*

"Snowball... As in all Level 9's adventures, the real pleasure comes not from scoring points but in exploring the world in which the game is set and learning about its denizens... this program goes to prove that the mental pictures conjured up by a good textual adventure can be far more vivid than the graphics available on home computers."

- *Which Micro?, Feb 84*

"Lords of Time. This program, written by newcomer Sue Gazzard, joins my favourite series and is an extremely good addition to Level 9's consistently good catalogue... As we have come to expect from Level 9, the program is executed with wonderful style - none of those boring 'You can't do that!' messages! Highly recommended." - *PCW, 1st Feb 84*

# IT'S NEW! THE EMULATOR

## WHAT DOES IT DO?

# SPECTRUM = COMMODORE 64

## WHERE CAN I GET ONE?

# READ ON

Video Vault make it possible for you to load SPECTRUM SOFTWARE into your COMMODORE 64 with the NEW EMULATOR.

The Emulator translates Spectrum programs into language the Commodore 64 understands and microcodes the program to fit the available memory capacity of the Commodore 64.

LOADS BOTH  
BASIC AND  
MACHINE CODE  
PROGRAMS

THERE ARE OVER 1000  
SPECTRUM GAMES  
NOW AVAILABLE TO  
COMMODORE 64  
USERS

ORDER YOUR  
AMAZING EMULATOR  
NOW FOR  
ONLY £12.95 + p.p.

## SPECIAL OFFER! SAVE £1.00

TEST YOUR EMULATOR! On Oceans top selling Spectrum Game Kong (Rec Price) £5.90 Special Offer. £4.90 SAVE £1.00 when ordering with the Emulator.

UK & OVERSEAS TRADE ENQUIRIES VERY WELCOME.

THIS PRODUCT IS ONLY AVAILABLE MAIL ORDER FROM VIDEO VAULT.

Complete coupon below and post off with Cheque/P.O. or quote Access No for £13.50 (£12.95 plus 55p post & package) for each Emulator. And £4.90 for each Kong game.

Please send: Emulator plus Kong at £18.40 inc. p.p.  Tick as appropriate  
Emulator only at £13.50 inc. p.p.

Access No.

Name

Address

Tel:  HCWI

# Video Vault

Post of to Video Vault, 140 High St. West, Glossop, Derbyshire.

## Final name

From front page

companies, including EPROM makers Elan Digital Systems which took out an injunction banning its use in the UK.

● So, to fill in the weeks while Enterprise was quietly registered world-wide, the computer was renamed the Flan. It had the double advantages of being quick and easy to do — just one stroke had to be removed from the E in Elan.

● Enterprise is now the name of both the computers and the company. The difficulty of the name, plus other problems, means that the first micros will now be in the shops in September, five months late.

Marketing director Mike Shirley said: "We have been

looking at the question of an international trading name for some months.

"The court injunction and the overseas distributor contact we made at the Consumer Electronics Show in Las Vegas brought the issue into focus.

"It seemed likely that we would encounter problems registering the old name not only in this country, but around the world too.

"We decided to dispel these doubts now, rather than face possible legal wrangles over the coming months and years."

Mr Shirley said the 64K model would be the first in the shops and that well-known high street chain stores had agreed to stock it.

It would include an interactive demonstration tape and he said at least 20 items of software would be available at launch, mostly written by Intelligent Software which designed the computer's own software.



Mike Shirley

Third party software houses would be provided with models in May to encourage them to write for the Enterprise.

Enterprise has signed a deal with Tyneside company Welwyn Electronics to make 150,000 computers in the first year and several thousand would be available at launch, said Mr Shirley.

Apart from RAM, the two models are identical. The features include: Z80A processor, typewriter-style keyboard with eight function keys and small joystick, video and sound chips dubbed Nick and Dave, built-in word processor, cassette recording meter, 672 x 512 screen resolution with 256 colours at one time, four voice, eight octave stereo sound through TV speaker and expandable RAM, up to 3,968K for the 128K model.

Mr Shirley said Enterprise would be producing its own peripherals, including badging other company's products. It would, for example, be putting an Enterprise box around another maker's disc drive.

Mensana, 49 Bramsgrove Rd, Edgware, Middx

Enterprise Computers, 31-37 Hoxton St, London N1

From page 3

ZX81 Special Deal which included a cassette with the claimed normal price of £4.95.

Illustrated was ZX81 VU-File and the complainant said that, as this usually sold for £7.95, it was not included in the deal.

Boots said it was. It had been included in initial supplies, but, as demand was likely to exceed supply, the advertisement said "Title subject to availability" and referred to £4.95 so as not to "over-claim". The authority commented that it would have been clearer to say "at least" £4.95.

A complaint against Atari was upheld over an advertisement for the Atari 600XL which said "RAM" is the measurement of a computer's power".

The advertisers said this would be generally understood, but the ASA disagreed and requested that the claim was amended in future advertisements.

Sinclair Research was asked to take care in future over claims about the screen display of the Spectrum available to inexperienced programmers using BASIC.

An advertisement said the resolution was 256 x 192 pixels but a complainant said his only produced 256 x 176, and the manual confirmed this. An independent expert told the ASA that professionally written software using machine code used all the graphics capability.

Advertising Standards Authority, Brook House, Torrington Place, London WC1E 7HN

## Survive or sacrifice

Conquer tests of endurance and skill or you'll end up as a human sacrifice. That's the theme of a new game, Aztec Challenge, just out for the Commodore 64 from Audio-genic.

There are seven levels — plus two additional phases — and the action takes place in the ancient pyramid of Tenochtitlan.

Aztec Challenge costs £8.95 or £12.95 on disc.

Audio-genic, PO Box 88, Reading, Berks

# You could be on our pages

We welcome programs, articles and tips from our readers.

**PROGRAMS** must always be sent on cassette. Listings are helpful, but not necessary. 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 made 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 Liptrot, Home Computing Weekly, No.1 Golden Square, London W1R 3AB

# Say no to seduction

"Why are girls not interested in computing?", bemoans the industry, belatedly realising that Man comes in two models and that only 50 per cent of the market has been tapped.

Plans have clearly been made for our seduction and hints of the approach are already appearing, sadly reminiscent of TV's old ideas of "women's programmes".

"Bright, colourful graphics", they say. Man has always felt that women see things differently. Presumably it's the manly thing to like dull black and white. "You don't see the nasties!" Oh, goodness! I mean, if we saw this graphic representation of a Dragon or something we might scream or even faint right away.

On the other hand, it's apparently all right to expect us to kill these unseen monsters if we want to win the game. And, let's face it, in the present state of graphic art it takes a lot of goodwill in the eye of the beholder, male or female, to accept what appears as what it is said to be. Some of them may be frightful, but frightening they're not.

Isn't it about time men learned the real facts of life?

Apart from the obvious, there is absolutely no difference between little boys and little girls. Some, of both sexes, will like football, fighting and eating and hate baths and going to bed. Some, of both sexes, like reading, embroidery, cooking, dressing up and playing with Action Man.

Little girls can be just as violent as girls, as many a mother with a beat-up son can confirm. And, as for them being frightened by nasties, you should see them avidly watching horror movies while Dad stares uncomfortably at the ceiling.

In other words, there's no need for different programs for girls. Like boys, they will buy those that interest them. And it's the attitude that girls need something different from boys that really causes the problem.

Just as we were beginning to overcome the old idea that girls don't do wood or metalwork or become engineers recessions and unemployment hit us. What with that, education cuts and scarcity of equipment, are schools actively encouraging girls in computer studies.

Does your son sit playing with his micro while your daughter has to help Mum with the washing up? Did you buy son a micro and daughter a nice cardigan for Christmas? And, if daughter complains, does Dad patiently explain that son needs it for his future career prospects and does Mum, forgive her, agree?

If, instead of Page Three females holding computers, magazines and other branches of the industry starting publicising the work of women already active within it, parents, teachers and the girls themselves could be encouraged to more positive attitudes.

But please, not "Mrs Bloggs uses her micro to work out her Fair Isle knitting patterns" or "Mary Jones keeps her weekly housekeeping budget on the Dragon". Somewhere, no doubt, there is a Mrs Bloggs and a Mary doing just that. But to keep insisting that women only do what men regard as "womanly" pursuits is both patronising and defeating the object of drawing them into what is at present a male dominated activity.

**Dorene Cox**  
Dagenham, Essex

• This space is for you to sound off about the micro scene, to present bouquets, to hurl brickbats, or just to share your opinions or experiences. Contributions from individuals earn a fee. Send your views to Paul Liprot, Editor, Home Computing Weekly, No.1 Golden Square, London W1R 3AB

## TOP SAVINGS

### ★ ★ PRINTERS ★ ★

	PRICE EX VAT		PRICE EX VAT
<b>BROTHER</b>		<b>QUME</b>	
HR1	£449.00	9/45 RD	£1595.00
HR15	£349.00	9/55 RD	£1945.00
HR25	£549.00	11/40 RD	£1195.00
EP22	£130.00	11/55 RD	£1375.00
EP44	£182.00	SHEET FEEDER	£490.00
<b>CANON</b>		<b>RICOH</b>	
PJ1080A 40cps	£369.00	RP1300S	£915.00
PW1080A 160cps	£279.00	RP1600S	£1190.00
PW1156A 160cps	£339.00	RP1600S SHEET FEEDER	£459.00
<b>DIABLO</b>		RP1600S TRACTOR	£138.00
630 API	£1325.00	FLOWWRITER 1600	£1249.00
SHEET FEEDER	£490.00	<b>SEIKOSHA</b>	
<b>EPSON</b>		GP100A	£175.00
RX 80T	£215.00	GP250X	£219.00
RX 80F/T	£242.00	GP700A Colour	£349.00
FX 80	£329.00	<b>STAR</b>	
MX 100F/T III	£375.00	GEMINI 10X	£199.00
FX 100F/T	£430.00	GEMINI 15X	£279.00
<b>MANNESMANN TALLY</b>		DELTA 10	£305.00
MT 80	£199.00	DELTA 15	£399.00
MT160	£419.25	<b>TEC</b>	
MT180	£800.00	1550 P	£475.00
PIXY PLOTTER	£505.00	STARWRITER F1040	£895.00
<b>NEC</b>		STARWRITER F1055	£1235.00
2010 20cps	£645.00	SHEET FEEDER	£459.00
3510 35cps	£1149.00	<b>PRINTERS - OTHER</b>	
7710 55cps	£1499.00	ANADEX DP6500 500cps	£2019.00
<b>OKI MICROLINE</b>		DRE 8925 240cps	£1385.00
OKI 80A	£180.00	FUJITSU SP830	£1545.00
OKI 82A	£269.00	HERMES 612C 400cps	£1695.00
OKI 83A	£420.00	JUKI 6100	£345.00
OKI 84A(P)	£655.00	OLIVETTI INK-JET JP101	£189.00
OKI 84A(S)	£730.00	OLYMPIA ESW103	£825.00
OKI 92P	£379.00	SHINWA CP80	£185.00
OKI 93P	£499.00	SMITH CORONA TP1	£249.00
OKI 92S	£450.00		
OKI 93S	£575.00		
OKI 2410P	£1595.00		

### ★ ★ MONITORS & VDU's ★ ★

	PRICE EX VAT
JVC 12in Hi-Res	£229.95
KAGA 12in Hi-Res	£215.00
NEC JB201ME	£185.00
SANYO 14in Colour Hi-Res	£435.00
SANYO 12in Hi-Res	£84.50
HAZELTINE ESPRIT VDU	£395.00
TELEVIDEO 910 VDU	£489.00

### ★ ★ COMPUTERS ★ ★

	PRICE EX VAT
<b>APRICOT</b>	
256K 0.315MB	£1275.00
256K 0.315MB MONITOR	£1440.00
256K 315Kx2	£1445.00
256K 315Kx2 MONITOR	£1575.00
<b>SIRIUS</b>	
128K 1.2MB	£1675.00
256K 2.4MB	£2165.00
256K 10MB	£2995.00
128K MEMORY EXPANSION	£222.00
256K MEMORY EXPANSION	£344.00
512K MEMORY EXPANSION	£589.00
EXTERNAL 10MB HARD DISK	£1375.00
<b>COMMODORE</b>	
COMMODORE 64	£156.51
COMMODORE DISK 1541	£165.21
COMMODORE C2N 1530 CASSETTE	£36.51
COMMODORE MPS801 PRINTER	£175.00
IBEK 64/Parallel INTERFACE	£59.50
COMMODORE 8096	£675.00
<b>EPSON</b>	
EXTERNAL 10MB HARD DISK	£1375.00
OX10	£1600.00
<b>KAYPRO</b>	
KAYPRO II	£1195.00
KAYPRO 10MB	£2250.00
<b>OLIVETTI</b>	
160KB 2x320KB Disk Drives	£1895.00
<b>SANYO</b>	
MBC 550	£650.00
MBC 555	£799.00
<b>SPECTRUM</b>	
SPECTRUM 48K	£108.70

## MAYFAIR MICROS

362 YORK ROAD LONDON SW18 1SP TEL: 01-870 3255

We're offering seventy -two prize packages of K-tel software in this week's competition

K-tel burst onto the software scene recently with a series of double-value tapes — two programs on the same cassette.

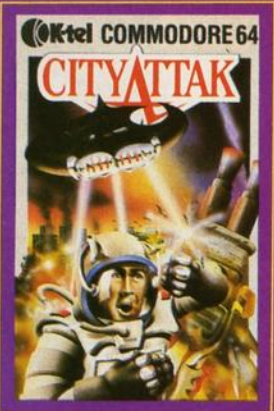
And now you stand a chance of winning a share of £1,000-worth of K-tel games. All you have to do is spot the K-tel titles in our word square.

Each of our 72 winners will receive two tapes for the Spectrum, VIC-20 or Commodore 64.

The prizes will include K-tel's latest releases: Cityattak, a fast-moving arcade-style game; It's Only Rock 'n' Roll, a text-graphics game which challenges you to make it as a rock star; Odyssey, where you fend off evil creatures with your laser; and Defusion and Worms, a new double-sider.

The first three run on the Commodore 64 and the last is for the 48K Spectrum.

K-tel, best-known for its "greatest hits" albums, has more programs in the pipeline and plans to extend its range to more home computers.



**The prizes**

Each of our 72 winners will get two K-tel tapes, a prize package worth £13.90.

If you are a winner with a 48K Spectrum your prizes will be selected from this list of double-siders:

- Defusion/Worms
- It's Only Rock 'n' Roll/Tomb of Dracula
- Castle Colditz/Battle of the Toothpaste Tubes
- Alien Swarm/Arena

And if you've got a VIC-20 you could win these two:

- Supavaders/Bomber Run
- Alien Demon (8K)/Plague

And winners with Commodore 64s will receive two of the following:

- It's Only Rock 'n' Roll
- Odyssey
- Cityattak

**How to enter**

Study the word square carefully and try to find all the K-tel software titles.

All of them, plus more, are in the three lists from which the prizes will be drawn.

Mark the titles you find by ringing them with a ballpoint pen or marking them with a semi-opaque felt-tip pen.

Fill in the coupon fully and clearly — if you are a winner it will be used as a label — and send the word square with the coupon to us.

You must mark on the back of the envelope the number of software titles you found.

Please make sure that the coupon, word square and envelope are correctly completed. Your computer must be given: 48K Spectrum, VIC-20 or Commodore 64. Entries which are incomplete cannot be considered.

You may enter as many times as you wish, but each entry must be on the official coupon and word square and in a separate envelope. Do not enclose anything else in your envelope.

Post your entry to K-tel Competition, Home Computing Weekly, No.1 Golden Square, London W1R 3AB.

Closing date is first post on Monday April 16, 1984. The first 72 correct entries opened at random after that date will win the prizes, regardless of computer named.

The prizes will arrive from K-tel within 28 days of the publication of the issue containing the names of the winners and the solution.

**The rules**

The closing date is first post on Monday April 16, 1984 and the prizes will be allocated according to the How to enter section.

Entries which do not follow the guidance given cannot be considered.

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# Birds and bugs, bombs and... boom!

To bring you these reports, our reviewers fought fleas, braved bombs and placed pipes

## Bed Bugs 32K BBC £6.95

Optima, 36 St Petersgate, Stockport SK1 1HL

A good original game which should appeal to those with a slightly twisted sense of humour. The theme is the elimination of bed bugs and fleas. It would have been easy enough to provide and use a laser base attached to the

bedside lamp (where else?)

But not this game. You have a jam sandwich to swat the fleas and false teeth to crunch the bed bugs. The sandwich is best — it has a wider area than the false teeth, which compensate by being able to kill bed bugs which the sandwich won't damage. The sandwich leaves stains which then have to be sponged and, as you can't hold two things at once, the fleas are free to bite.

## 3D Star Trek TI-994A £7

Stainless, 10 Alstone Rd, Stockport, Cheshire SK4 5AH

Scoring 0% for originality, this is yet another version of the game probably inspired by the film.

After about a minute, while the universe is being created, a 3D view from the bow and stern of your space ship is displayed, together with all the usual information including present position, stardate, number of photon torpedos and number of Klingon ships.

There are seven commands: navigation, fire weapon, multiple target firing, locate Klingons, convert fuel/weapons, locate Star Base, end.

The two types of weapons are

phasers and photon torpedos, the latter being surprisingly inaccurate. One would have thought that a computer clever enough to locate a distant Klingon would at least be able to destroy it with a torpedo.

Bearing in mind only 10 torpedos can be on board at once and that the clumsy firing system uses up valuable torpedos, it is plain to see why the energy/weapon command is needed.

In common with most TI games, 3D Star Trek is very slow but is quite enjoyable and makes good use of TI graphics. **J.J.**

instructions	75%
playability	65%
graphics	80%
value for money	60%



## Blue Thunder 48K Spectrum £5.95

Richard Wilcox Software, Foundation Business Systems, 2 Station Rd, Hammerwich, Walsall, W. Midlands

The first from a new software house — I can't wait to see the second.

You take-off from a destroyer, fly jetcopter to a remote island where comrades are captive, find and destroy an unstable nuclear reactor before landing to rescue.

Jetcopter controls: Up/Down = Q/A, Left/Right = X/V, C giving Fire plus 90 or 180 degree Rotation, depending on pressure. A mite difficult at exciting moments, but permitting flight and diagonal movement all positions except upside down. Also hold and abort.

Superb graphics and smooth

pixel scrolling through six screens with score and fuel displayed. Just getting to the island through ack-ack, homing missiles, is difficult enough, but then you must discover the secret of revealing the reactor, disable its outer defence, destroy it, land, rescue as many as possible, and return through heavier fire. Missions also include enemy submarines, balloons and jetfighters. A nice touch is the ability to select mission level. My only grouse: edition 1 has no joystick capability. Edition 2, due out now, has Kempston.

Hugely exciting and very frustrating. Just as you think you've cracked it — boom! Even hardened arcaders should love it.

instructions	90%
playability	95%
graphics	95%
value for money	100%



The final solution, if you are badly bitten, (nine leading to a nasty death) is to call Dr. Soothe. But don't leave it too late as he arrives slowly on occasions.

Good colour, fast action, new ideas and realistic sound (yes, I know what fleas sound like!) mean a good value game which I fully intend to master soon. Also on disc at £8.95. **D.C.**

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



## Flying Feathers CBM 64 £6.99

Bubble Bus, 87 High St, Tonbridge, Kent TN9 1RX

In common with others from Bubble Bus, this game has a very good opening screen and signature tune. When you start you are sitting in a boat by the river bank. You have to protect the fish from greedy swooping eagles.

You have a shotgun and, using joystick or keyboard, position your aim with a cross on the screen. When eagles swoop you let rip. If an eagle manages to catch a fish you can still retrieve it, providing you shoot the eagle before it has left the screen.

I don't know what the anti-blood sport lobby will make of

this. Although the fish fall back to the river, shot eagles don't thud to the ground. The screen is kept remarkably free of blood to prevent this becoming the first software nasty.

The scenery is very appealing — cotton wool clouds sail gracefully across the sky, occasionally a group of ducks quacks upstream. I felt I should have my picnic lunch by the 64. A very pleasant game for hunting, shooting, fishing types and prospective game wardens. **L.C.**

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



## Plumb Crazy CBM 64 £7.95

Terminal, 28 Church La, Manchester M25 5AJ

A novel race against time requiring a good eye for laying pipes. The theme is to link a boiler, about to explode, to a relief valve. The path between the two is strewn with rocks so the pipe has to be laid in a

roundabout way. For extreme emergencies George, the plumber, has a few sticks of dynamite.

To lay a run of pipes George has to rush back and forth to Stores selecting the appropriate "bend". When suitably positioned pressing fire "lays" that section. A pressure gauge is a constant reminder of the need for urgency. About 10 seconds before the boiler explodes the gauge thoughtfully sounds an

alarm.

If you manage to successfully join up the pipes before it's too late you proceed to the next level. There are 99 increasingly difficult levels of play.

The numbers of obstructing rocks increase. And George has to face the ghost of his former employer — to be avoided at all costs.

I enjoyed this game. Options, levels, method of scoring and bonus points are pitched about

right, so interest is maintained and you're inclined to have "just one more go". **L.C.**

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





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# NEW!

## 48K SPECTRUM FRED

Author: **Indescomp**

Action beneath the Pyramids!  
Fearless Fred the Intrepid Archaeologist searches the creepy catacombs below the torrid tomb of 'Tootiecarmoon' for the terrible treasures amidst monstrous mummies, ghostly ghosts, bats and rats!

## COMMODORE 64 BOOGABOO (THE FLEA)

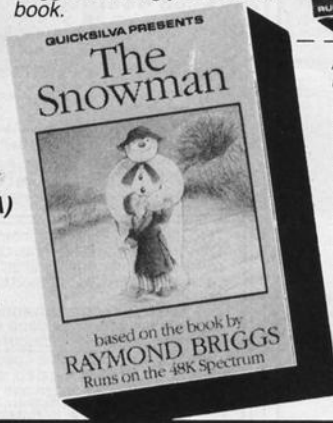
Author: **Indescomp**

Itchy action!  
Jump your way out of the caves with Bugaboo the flea but beware of the fearsome Dragon as you jump around the exotic vegetation.

## 48K SPECTRUM RAYMOND BRIGGS' THE SNOWMAN

Author: **David Shea**

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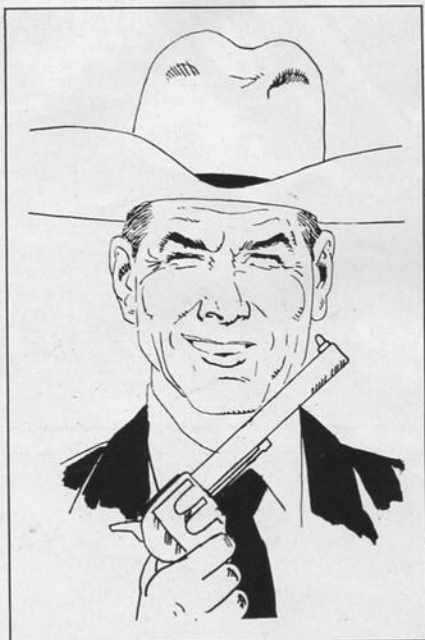
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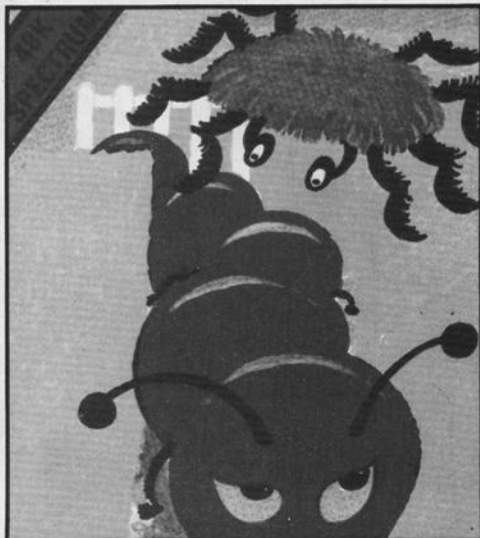


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## North Sea Oil Dragon 32 £5.75

Shards, 189 Eton Rd, Ilford,  
Essex IG1 2UG

A nicely written, simple to play simulation game where you are an offshore installation manager trying to accumulate \$100m in the shortest time possible by drilling for oil.

Played in chunks of one week at a time, there are two stages — the first involves navigating your supply vessel to the rig and allocating a weekly budget. The variables involved are few and this is no great task. A nice map of the North Sea is drawn.

You must then apportion your workforce of 200 to their tasks and set about moving the oil rig

looking for oil by keyboard or joystick and pressing D for drill.

When all your allocated wells have been drilled you are shown a balance sheet and you are returned to load up again for another week. I never got to the magic \$100 million. The game is professionally presented and well error trapped.

Various messages are displayed. My favourite: "You have fallen off the edge of the world". As a role-playing game this is quite simple and it can become a little boring after a time. **D.W.J.**

instructions	95%
playability	70%
graphics	65%
value for money	70%



## Hicksted 48K Spectrum £5

Cases Computer Simulations, 14  
Langton Way, London SE3 7TL

A thoughtful simulation of the TV's popular sport of show-jumping, although why advertised as a "game for girls"

escapes me — it wasn't Ms Smith who gave the controversial victory salute.

Up to 25 compete, riders and horses being named by players. Names can be carried over into the next game. Each game has three rounds with courses of increasing difficulty and you can adjust the time allowed or starting speed. Control is from keyboard or Kempston-type

# Join the quest for a fortune

## New simulations and adventures: our reviewers ventured forth. Now they report back...

joystick.

Screen displays are good, with running time and faults during each turn, a rundown of everyone's score at the end of each round and a final hall of fame. Controls seem difficult, even for fast fingers and, although an excellent animated horse is shown in the "set-up" screen, the game graphic resembles a Death Watch Beetle. Loading was troublesome, needing top settings, an alternative recorder,

patience and better tape quality.

Side 2 contains Mathsted — version where the horse pauses at each fence until you answer a sum.

	<b>D.C.</b>
instructions	90%
playability	70%
graphics	60%
value for money	75%



## Mystery of the Java Star Dragon 32 £7.95

Shards, 189 Eton Rd, Ilford,  
Essex IG1 2UG

A mainly graphic adventure in four parts. Each part must be separately loaded and each must be completed before you can go on to the next. There are three levels of difficulty and a score table at the end.

The purpose is to find and search the wreck of a ship which sank in 1967 to recover its precious cargo. At the beginning you have a sum of money with which to finance your expedition and pay for any help you may need.

In part one you need to solve two jigsaw puzzles of the log

book and map. Thankfully you can buy a quick look at the correct solution.

In part two you must gather more information to help you in your quest by visiting various London landmarks. Part three requires you to pinpoint the correct island. And in part four you must locate and search the wreck to recover the gold and the Java Star ruby.

Full instructions are included, partly on screen and partly on an insert. Another excellent multi-part adventure from Shards. I don't know how they do it but I hope they continue. **J.E.M.**

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



## The Cricklewood Incident Dragon 32 £7.95

Salamander, 17 Norfolk Rd,  
Brighton, Essex BN1 3AA

As bored millionaire Arnold Q. Volestrangler you set out from your padded cell to find the Holy Grail in this machine code adventure.

The screen display shows you where you are, which direction you can go, how much money you have, your state of health and articles of possible interest.

You need money to purchase things and pay for rides on buses and trains. You only begin with a few pence and need to obtain more. My poor character kept getting mugged and was

permanently penniless despite being a millionaire. If your health deteriorates you get whisked off to hospital. There are all sorts of nasty people about to thwart your quest. There are some nice sound effects though. I particularly like the police siren.

The insert containing the instructions is not very helpful. It is up to you to discover, if you can, exactly what is possible. Thankfully, if you get hopelessly stuck you can send for a help sheet and save it meanwhile.

Directions must be shortened to one letter. The other instructions, input as a verb and a noun, can be shortened to three letters. **J.E.M.**

instructions	60%
playability	80%
graphics	N/A
value for money	75%



## Diamond Quest 48K Spectrum £5

Cases Computer Simulations, 14  
Langton Way, London SE3 7TL

CCS has the right idea — encouraging girls into computing. But tacky insert comments like "appealing to girls because of bright, colourful

graphics and you don't see the Nasty Monsters" may bring the local St Trinians down upon them with hockey sticks!

This is a very simple text adventure with very simple location graphics in which your aim is to find four keys, build your energy above 200, find and enter the Golden Palace and remove the Diamond Treasure.

Eating free food or staying at costly hotels (no roughing it for girls) increases energy and gold

may be converted into energy. Nasties are attacked, bribed or fled from, costing energy or gold. With 200 energy you can see a grid map, showing relative positions of you and the palace.

Nasties are supposed to give gold when killed, but often didn't and, by persistently pressing lower figures, you can force them to accept lesser bribes than initially refused. I had all keys, the 200 energy and, according to the map, reached

the palace but the program refused to let me enter. Bugs and loading difficulties aside, this adventure is written on an insupportably low level. **D.C.**

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



# Draw at s our

The human eye is, debatably, the most powerful input device to the human mind, with a stereoscopic resolution of about 1,500 by 1,500 for colour and intensity.

Thus, logically, the best way to get information is through pictures. Until a couple of decades ago, the only sensible way to present viewed data was in 2D pictures, perhaps giving a slight impression of the 3D extent of the object.

However, with the advent of the faster computers with high resolution graphics, full 3D representation and motion of objects became more feasible. The first well-known use of this was on the 2001 spacecraft displays.

### How it works (listing 2)

- 5-7 set SIN and COS values
- 8 speed increase on the Commodore 64
- 10-20 set Extended BASIC commands
- 30-40 set mode and colours
- 50 set X, Y and Z perspective
- 70-80 READ variables and detect end
- 100-140 calculate 3D coordinates after rotation
- 150 add perspective
- 160-180 combine for a 2D screen
- 200-210 set hi-res screen limits
- 260-270 draw the line
- 1000-1130 3D object DATA
- 2000-2030 after drawing, reset speed and mode

This took a lot of long hard work and expensive hardware.

Now, with the concepts and programs from my articles here and next week, you will be able to make and view 3D wire frame objects on the computer. If you have a Commodore 64 and my Extended BASIC, you will be able to plot them at speed — twice as fast as the BBC micro.

To accurately draw a 2D object, a graph with an X and Y axis is generally used. Thus, for drawing 3D objects, Z axis is added.

With these set, you can draw one view of a 3D object, so to see it from all angles, you need to rotate it. This is the basis of what is used in the 3D equations given in listing 1. The addition of a perspective equation gives the full 3D impression.

Listing 2 is a program that draws 3D objects on the Commodore 64 with Extended BASIC, using the DATA at the end of the program.

Next week's program will include a facility to dump the first graphics screen to a VIC 1525 printer. You can see the result of this in the pictures adorning this article. To use the program, simply RUN it, and

```

90 REM* 3D EQUATION *
91 REM*A1 TO A6 REPRESENT*
92 REM*SIN AND COS VALUES*
93 REM* PRE-CALCULATED *
100 Y1=Y*A2-Z*A1:Z=Y*A1+Z*A2
120 X1=X*A4-Z*A3:Z=X*A3+Z*A4
140 X=X1*A6-Y1*A5:Y=X1*A5+Y1*A6
160 X=2*X+PX:Y=2*Y+PY:Z=Z+PZ
170 Z=(256-Z)*(256-Z)/256
178 REM*128 AND 99 ARE NUMBERS*
179 REM* FOR SCREEN CENTERING *
180 X=128-X*Z/256:Y=99-Y*Z/256
    
```

**Listing 1 — do not type in.** Shows the equations used in the programs; useful also as an aid for conversion to other micros.

press a key when you have finished with the resulting drawing.

The equations have been set out in the most streamlined neat way, and other speed increase additions make this a very fast BASIC routine, managing two points per second.

However, even for small drawings, completion takes time, so I have not included movement by key presses. Instead, you can change variable numbers at the start of the program by reference to the variable list.

DATA in listing 2 draws a simple house. However, if you want something more impressive, simply type listing 3 in instead of the house DATA for a view of the 2001 space station.

If you want to create your own shapes, here are the data rules: data is set out as X, Y and Z coordinates, in the range of -63.99 to 63.99. 64,0,0 marks the end of a set of lines, and the start of a new set. 65 represents the end of all DATA.

### Variables

- PH, TH, PS X, Y and Z rotation angles
- A1 to A6 resulting SIN and COS values
- PX, PY, PZ Perspective (X moves object Xwards, Y Ywards and Z changes magnification)
- X, Y and Z actual 3D coordinates
- X%, Y% resulting screen coordinates

**Listing 2 — uses Extended BASIC to draw a house similar to the one seen on BBC TV, except that this is faster than the BBC micro. Remember to type NEW after loading Extended BASIC and before entering this program**

```

1 REM*FAST BASIC 3D ROUTINE*
2 REM* BY DAVID REES *
5 PH=-PI/3:TH=PI/16:PS=0
6 A1=SIN(PH):A2=COS(PH):A3=SIN(TH)
7 A4=COS(TH):A5=SIN(PS):A6=COS(PS)
8 POKE56325,255
10 MODE=51828:GCOL=51770:GMOVE=52039
20 LINE=51754:GTEXT=52657
30 SYSGCOL,5,0:SYSGCOL,6,0
40 SYSMODE,0,0,1:SYSGCOL,1,8
50 PX=-50:PY=0:PZ=-63
60 FORN=1TO31
70 READX,Y,Z:IFX=64THEN60
80 IFX=65THEN2000
100 Y1=Y*A2-Z*A1:Z=Y*A1+Z*A2
120 X1=X*A4-Z*A3:Z=X*A3+Z*A4
140 X=X1*A6-Y1*A5:Y=X1*A5+Y1*A6
160 X=2*X+PX:Y=2*Y+PY:Z=Z+PZ
170 Z=(256-Z)*(256-Z)/256

180 X=128-X*Z/256:Y=99-Y*Z/256
200 X%=X*(X>0)*(X<320)-319*(X>319)
210 Y%=Y*(Y>0)*(Y<200)-199*(Y>199)
260 IFN=1THENSYSGMOVE,X%,Y%:GOTO300
270 SYSLINE/2,X%,Y%
300 NEXT
1000 DATA-30,20,-20,-30,-20,-20,-30,-2
1010 DATA-30,20,20,-30,20,-20,30,20,-2
1020 DATA30,20,20,-30,20,20,-30,30,-3
1030 DATA-20,20,30,-20,20,30,,30,30,20
1040 DATA30,-20,20,30,-20,-20,-30,-20,
1050 DATA64,,,-30,,30,30,,30,64,,
1060 DATA30,20,-20,30,-20,-20,64,,
1070 DATA30,10,-20,30,-10,-20,30,-10,4
1080 DATA30,10,40,30,10,-20,40,10,-20
1090 DATA40,10,40,40,-10,40,40,-10,-20
1100 DATA40,10,-20,64,,
1110 DATA30,10,40,40,10,40,64,,
1120 DATA30,-10,40,40,-10,40,64,,
1130 DATA30,-10,-20,40,-10,-20,65,,
2000 GETA$:IFA$=""THEN2000
2010 SYSMODE,6,0,0
2020 PRINT"□"
2030 POKE56325,68
    
```



# 3D pictures speed with Extended BASIC



We know from your letters how many CBM 64 owners use the Extended BASIC in issues 45-47. Now the author, HCW regular David Rees, shows how to use it to create 3D graphics. And there's more next week

Finally, if you consider that this and next week's articles provide animation close to the standard of that used in 2001, ponder this: those who have seen Wrath of Khan will know that it uses state of the art computer graphics (much better than Tron), so imagine what you could do with those graphics on a home computer in 20 years' time.

**Next week:** Enterprise drawing DATA, a screen dump routine and a Warp 9 drawing routine!

**Hints on conversion**

All that needs changing for other micros are the Extended BASIC commands (they start with SYS) to your commands (MODE 0 = graphics; 6 = text; GCOL changes screen colours), and your screen limits in lines 200-210.

```

10 REM*****
11 REM* DATA FOR THE *
12 REM*2001 SPACE STATION*
13 REM* FOR BOTH THE *
14 REM*BASIC AND MACHINE*
15 REM* CODE 3D PROGRAMS *
16 REM* BY *
17 REM* DAVID REES *
18 REM*****
1000 DATA-44,12,11,-31,32,11,-12,44,11,12,44,11
1010 DATA31,32,11,44,12,11,44,-12,11,31,-32,11
1020 DATA12,-44,11,-12,-44,11,-31,-32,11
1030 DATA-44,-12,11,-44,12,11,-37,10,11
1040 DATA-27,28,11,-9,38,11,9,38,11,27,28,11
1050 DATA37,10,11,37,-10,11,27,-28,11,9,-38,11
1060 DATA-9,-38,11,-27,-28,11,-37,-10,11
1065 DATA-37,10,11
1070 DATA-37,10,7,-27,28,7,-9,38,7,9,38,7
    
```

Listing 3 — follow the instructions for listing 2 and use the DATA here to replace the DATA in listing 2. You'll see a picture of a space station, similar to the one in 2001

```

1080 DATA27,28,7,37,10,7,37,-10,7,27,-28,7
1090 DATA9,-38,7,-9,-38,7,-27,-28,7,-37,-10,7
1100 DATA-37,10,7,-44,12,7,-31,32,7,-12,44,7
1110 DATA12,44,7,31,32,7,44,12,7,44,-12,7
1120 DATA31,-32,7,12,-44,7,-12,-44,7,-31,-32,7
1130 DATA-44,-12,7,-44,12,7,64,,
1140 DATA-7,-2.5,7,-37,-2.5,7,-37,-2.5,11
1150 DATA-7,-2.5,11,-7,2.5,11
1160 DATA-37,2.5,11,-37,2.5,7,-7,2.5,7
1170 DATA-2.5,7,7,-2.5,38,7,-2.5,38,11
1180 DATA-2.5,7,11,2.5,7,11,2.5,38,11
1190 DATA2.5,38,7,2.5,7,7,2.5,7
1200 DATA37,2.5,7,37,2.5,11,7,2.5,11
    
```

**Faster loading for Extended BASIC, by Peter Lager**

After many hours I eventually typed in and verified all that DATA for Extended BASIC (HCW 45 and 46) and it was time well spent.

In an attempt to reduce the time taken to load and run the two program parts I produced

## COMMODORE 64 PROGRAMMING

one program containing both sets of data.

Even so, it still took more than eight minutes to load and run.

This program will reduce this time to 2 mins 40 secs (I timed it):

```
100 GOTO 200
200 POKE45,0:POKE46,25:
   CLR:FOR1=0TO4095:
   POKE
   2300+1,PEEK(49152+I):
   NEXTI:END
300 PRINT"SETTING UP EXTENDED BASIC"
310 FOR1=0TO4095:POKE
   49152+1,PEEK(2300+I):
   NEXTI:PRINT"TASK COMPLETED":NEW
```

To use the program follow these steps:

- 1 Load and run parts 1 and 2 of the Extended BASIC program so that machine code is in RAM from 49152
- 2 Enter NEW (return) to clear any programs from RAM
- 3 Type in the program listed here exactly as written. Do not leave any spaces except those required in the two print statements
- 4 Save the program to tape
- 5 Enter RUN (return)
- 6 Enter LIST (return)
- 7 Using the screen editor, change line 100 to read 100 GOTO 300. Important: do not make any other alterations to the program at this stage. If you have made any errors then load a copy of the program from tape, correct it and repeat from step 4
- 8 Save this program to tape

This program now contains the loader and all the data for the Extended BASIC commands. Just load and run the program whenever you want these commands.

This is how my program works: The Commodore 64 uses two pairs of memory locations to point to the start and end of any BASIC program:

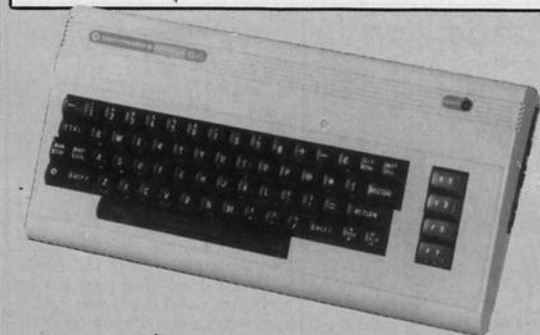
locations 43,44 LSB and MSB of start of BASIC program

locations 45,46 LSB and MSB of end of BASIC program/start of numeric variables

When the computer executes a SAVE command it saves the memory between these pointers.

When the program listed here is first run, step 5, line 100 directs the program to line 200. The end of the BASIC pointer

```
1210 DATA7,-2.5,11,37,-2.5,11,37,-2.5,7
1220 DATA7,-2.5,7,2.5,-7,7,2.5,-37,7
1230 DATA2.5,-37,11,2.5,-7,11,-2.5,-7,11
1240 DATA-2.5,-37,11,-2.5,-37,7,-2.5,-7,7
1250 DATA-7,-2.5,7,-7,-2.5,11,-7,2.5,11
1260 DATA-2.5,7,11,2.5,7,11,7,2.5,11
1270 DATA7,-2.5,11,2.5,-7,11,-2.5,-7,11
1280 DATA-7,-2.5,11,64,,
1290 DATA-5,2,11,5,2,11,5,-2,11
1300 DATA-5,-2,11,-5,2,11,64,,
1310 DATA-2.5,-2.5,7,-2.5,-2.5,-7,-2.5,2.5,-7
1320 DATA-2.5,2.5,7,2.5,2.5,7,2.5,2.5,-7
1330 DATA2.5,-2.5,-7,2.5,-2.5,7,-2.5,-2.5,7
1340 DATA64,,
1400 DATA-44,12,-11,-31,32,-11,-12,44,-11,12,44
1410 DATA11,31,32,-11,44,12,-11,44,-12,-11,31
1420 DATA-32,-11,12,-44,-11,-12,-44,-11,-31,-32
1430 DATA-11,-44,-12,-11,-44,12,-11,-37,10,-11
1440 DATA-27,28,-11,-9,38,-11,9,38,-11,27,28,-11
1450 DATA37,10,-11,37,-10,-11,27,-28,-11,9,-38
1460 DATA-11,-9,-38,-11,-27,-28,-11,-37,-10,-11
1465 DATA-37,10,-11,-37
1470 DATA10,-7,-27,28,-7,-9,38,-7,9,38,-7,27,28
1480 DATA-7,37,10,-7,37,-10,-7,27,-28,-7,9,-38
1490 DATA-7,-9,-38,-7,-27,-28,-7,-37,-10,-7,-37
1500 DATA10,-7,-44,12,-7,-31,32,-7,-12,44,-7,12
1510 DATA44,-7,31,32,-7,44,12,-7,44,-12,-7,31
1520 DATA-32,-7,12,-44,-7,-12,-44,-7,-31,-32,-7
1530 DATA-44,-12,-7,-44,12,-7,64,,
1540 DATA-7,-2.5,-7,-37,-2.5,-7,-37,-2.5,-11
1550 DATA-7,-2.5,-11,-7,2.5,-11
1560 DATA-37,2.5,-11,-37,2.5,-7,-7,2.5,-7
1570 DATA-2.5,7,-7,-2.5,38,-7,-2.5,38,-11
1580 DATA-2.5,7,-11,2.5,7,-11,2.5,38,-11
1590 DATA2.5,38,-7,2.5,7,-7,7,2.5,-7
1600 DATA37,2.5,-7,37,2.5,-11,7,2.5,-11
1610 DATA7,-2.5,-11,37,-2.5,-11,37,-2.5,-7
1620 DATA7,-2.5,-7,2.5,-7,-7,2.5,-37,-7
1630 DATA2.5,-37,-11,2.5,-7,-11,-2.5,-7,-11
1640 DATA-2.5,-37,-11,-2.5,-37,-7,-2.5,-7,-7
1650 DATA-7,-2.5,-7,-7,-2.5,-11,-7,2.5,-11
1660 DATA-2.5,7,-11,2.5,7,-11,7,2.5,-11
1670 DATA7,-2.5,-11,2.5,-7,-11,-2.5,-7,-11
1680 DATA-7,-2.5,-11,65,,
```



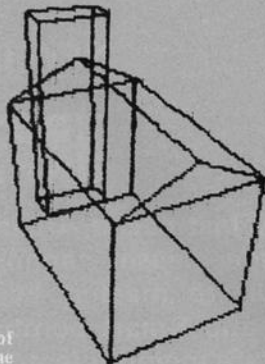
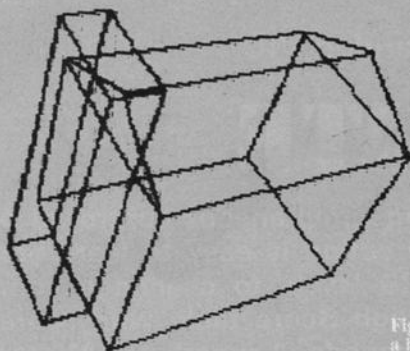
is moved to include an extra 4K of unused RAM, then copies the Extended BASIC data from 49152 onwards into this space.

Line 100 is then altered so that when the program is next run it loads the data back into position for use, then clears itself ready for your program.

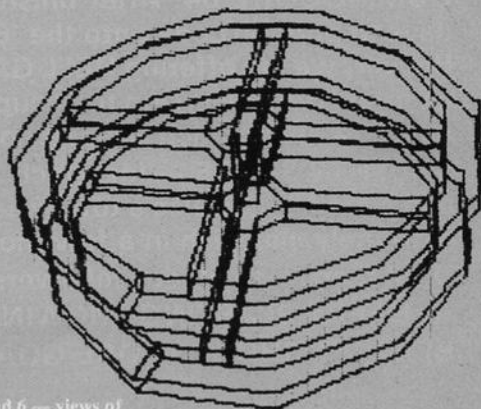
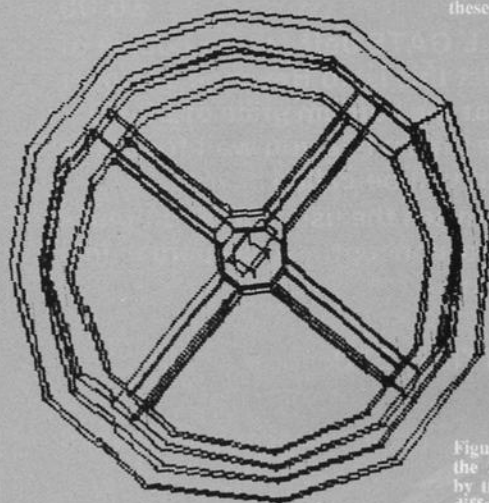
Therefore, when the program is saved, step 8, both the loader program and the data are saved.

At step 7 I have stressed the point about altering the program. This is because line 310 expects the data to start at 2300 and any insertions or deletions in the BASIC program will cause the data to be moved in RAM.

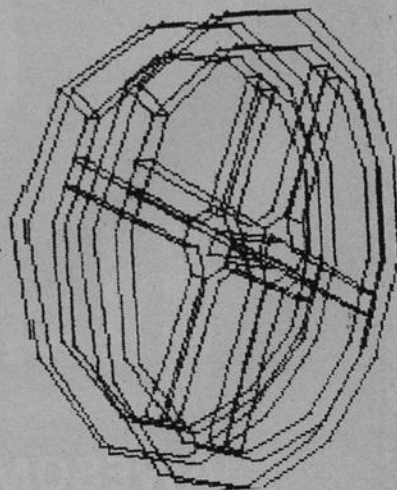
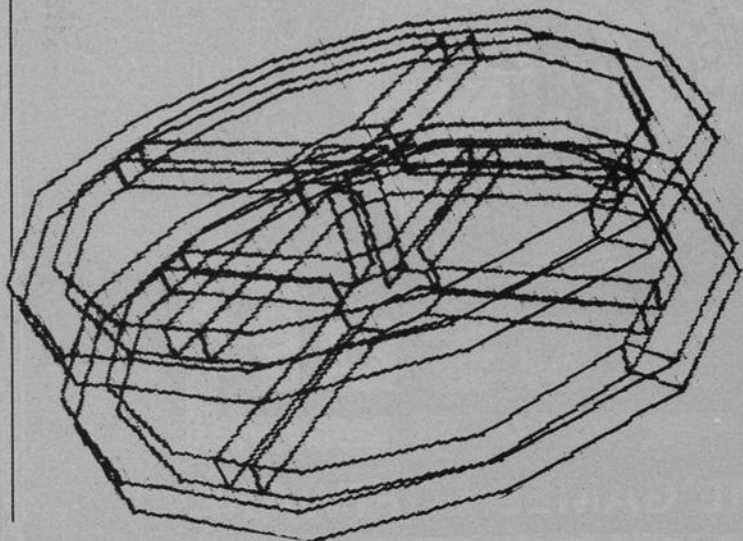
An insertion of one character in the program will move the data to start at 2301.



Figures 1 and 2 — two views of a house drawn by listing 2. The images are in light blue on a black background. Next week's article shows how to produce these screen dumps.



Figures 3, 4, 5 and 6 — views of the 2001 space station created by the DATA in listing 3. The differing perspectives of the house and space station are produced by altering the DATA



# LLAMASOFT NEWS

NEW for the 8K Expanded VIC:

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COMMODORE 64: After finishing HELL GATE Jeff took a couple of days to pop the code onto the '64. Whilst this is no Revenge or Hover Bover, we are offering HELL GATE 64 at the bargain price of £5.00... an interesting diversion to occupy a little time while you wait for Jeff's next '64 epic, which we can now reveal will be called

SHEEP IN SPACE — for which Jeff promises the usual great graphics and sound — and also a totally new control concept... so prepare to feel extremely sheepish in a few month's time.

Until then — to all our followers

A) HAPPY BLASTING/MOWING/SPITTING ETC.

B) DON'T SHOOT THOSE GOATS!!!

BY JEFF MINTER FROM LLAMASOFT

*Jeff*



*Minter*

# Llamasoft

## AWESOME GAMES SOFTWARE

49 MOUNT PLEASANT, TADLEY, BASINGSTOKE, HANTS.

# Come back, all is forgiven: a ROM secret exposed

Buried in the depths of the 16K ROM chip of your Spectrum there are a number of unused routines.

A disassembly reveals ZX81 tape support (between addresses 04AAH and 04C1), a "free memory" call which shows how much memory is remaining (type PRINT 65536-USR 7962 to use the call), and a number of more mysterious routines deep in the BASIC interpreter.

We have discovered an extra command which is not normally available or documented in the Spectrum manual. The short program in Listing 1 allows you to use the build in COME FROM statement — the opposite of a GOTO.

The COME FROM statement is a relatively new feature of the BASIC language, although it features in the new ANSO standard.

In simple terms, it allows you to re-direct processing from any point in a program. Simply type COME FROM 100 and the computer will automatically jump to the statement following the command as soon as line 100 is encountered.

Presumably Sinclair decided not to implement the statement at a late stage in the development of the Spectrum, since the required routines are already present (but isolated) in the ROM. One possible reason could be the already-cluttered Spectrum key layout.

Listing 1 uses the ENTER key to generate the COME FROM token — type and RUN the program, then press SHIFT and ENTER together to produce the new keyword.

Just as with GOTO, you can use a "computed COME FROM" statement (such as COME FROM X + 100) to make up for the lack of an ON..COME FROM command.

The expression is evaluated before each line is executed and a jump takes place if the expression matches the new line number.

This slows down program execution slightly, but constant COME FROM statements are not affected since the Spectrum already checks for those, even if the facility has not been enabled. This is one of the main reasons why ZX BASIC is slower than the Microsoft variety.

The operation of Listing 1 is quite simple — a temporary

## The team that wrote the Spectrum decided against using some BASIC commands — but clever programming can get at them. Don Swimigoon shows how to reach one of them

Listing 1 — the COME FROM support routine

```
100 REM COME FROM statement:
110 REM Don Swimigoon 1/4/84
120 REM
130 LET total=0
140 FOR i=23296 TO 23355
150 READ a
160 LET total=total+a
170 POKE i,a
180 NEXT i
190 IF total<>4480 THEN PRINT "
ERROR IN DATA": STOP
200 RANDOMIZE USR 23296
210 DATA 62,199,205,32,91,6,0,1
20,211,54,118,16,250,62,70,205,3
2,91,62,2,205,1,22,17,44,91,1,16
,0,195,60,32,50,141,92,62
220 DATA 2,205,1,22,205,107,13,
201,22,11,10,18,1,65,80,82,73,76
,32,70,79,79,76,33
```

routine is POKED into the Spectrum printer buffer, which modifies the operation of the built-in syntax checker so that COME FROM is recognised, as the authors of the ROM originally intended.

Since the code is already present inside the computer, the printer buffer is only used temporarily — vectors in the read-only memory are altered so that the statement is still recognised after the temporary

code has been overwritten.

Since the change uses no permanent RAM space it is protected against the effects of CLEAR and NEW. Of course, you still have to re-load it if you turn the computer off, since the ROM reverts to its original state once power is removed.

A small limitation in the use of COME FROM is that you must make sure that the relevant line exists, or the computer could go into an infinite loop trying to come from a line that does not exist. In practice this is not a major restriction since COME FROM is most useful when debugging programs, and consequently the facility will not be used until the rest of the program has been typed in.

This article only brushes the surface of the extra features hidden in the Spectrum ROM.

In future articles we hope to explain the IF..THEN..ELSE facility, which goes one step beyond Microsoft BASIC by allowing an useful OTHERWISE clause for cases which would not be handled by either THEN or ELSE.

With a minor hardware change it is even possible to extend the colours outside the visible range — PAPER codes 0 to 7 give the usual colours, while negative numbers produce an infra-red display and large numbers produce ultra-violet radiation (this may not work on older TV sets).

If you've never thought of your Spectrum as a sun-ray lamp before, watch out for the next part of this occasional series!



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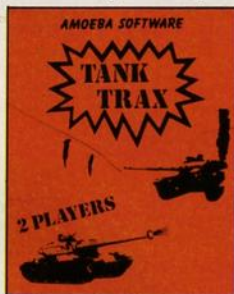


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LAZE BLAZE  TANK TRAX  Please tick choice

## U.S. SCENE

# Software sales soar

This year looks to be the time in which the emphasis is shifting from "hardware wars" to improvements in the software area.

It is estimated that software for use in U.S. homes this year will total about \$840 million. This can be subdivided into several categories. Home accounting software will account for about \$60 million, and is projected to grow about 50 per cent a year over the next five years.

Financial home software, such as tax preparing programs, stock management packages, and so forth, will account for about \$25 million this year and is expected to grow at the rate of 80 per cent a year for the next five years. It still looks as though entertainment software makes up about 80 per cent of the market, but the market continues to grow by leaps and bounds.

Some new releases... Atari has just announced a light pen and an accompanying electronic science kit and is also shifting its software development away from games with more emphasis on personal development and home management programs...

Broderbund has introduced Bank Street Speller, which is a spelling checker made to accompany Bank Street Writer... In conjunction with its graphics input tablet called the PowerPad, Chalk Board has introduced six new software packages and also a related line of books... Prentice-Hall is coming out with a software package called The Profit Center, which includes 21 separate business/personal productivity programs...

Synapse has released its Relax program, which is the first in a series of home health-orientated programs. It is also in the process of marketing a new series of home software... Home Computing Software has just released ProGolf, an instructional program which was designed by professional golfer Tom Weiskopf... TI, Walt Disney and Sierra-On-Line have finally reached an agreement enabling Sierra to market five educational software games for the 99/4A which use Walt Disney characters (better later than never?)... The electronic publishing division of Simon and Schuster has announced plans to develop science fiction computer games to be written by prominent sci-fi authors such as Robert Heinlein...

Activision and Atari have reached a joint agreement to distribute programs to users' homes via electronic means (i.e. over the phone lines). Not too many retailers are pleased about this.

Meanwhile Romox, the company that first started electronically distributing programs, continues to expand its efforts at a frantic pace. Using the Romox Programming Terminal, the 10 participating software manufacturers can have their products sold to users through various traditionally non-computer stores (typically small convenience food stores and record stores). Programs can be loaded onto reusable cartridges in less than a minute.

The advantage to the stores is that no inventory needs to be handled, and it will build up their walk-in trade immensely. You can tell it's 1984 — before now, who would ever imagine being able to buy a Coke while waiting for your program to load, and all in the same store? There are at least five large firms who are beginning to specialize in electronic software distribution.

I predict that the trend will continue, that it will expand at a tremendous rate, and that it will ultimately have a detrimental effect on small computer retailers who depend on entertainment software sales as a significant portion of their income.

That's some of what's happening. Out of room again. See you next week.

Bud Izen  
Fairfield, California

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COMMODORE



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## Red Riding Hood 48K Spectrum £9.95

Five Ways, Arrow, 17-21 Conway St, London W1P 6JD

Using the Five Ways of story book, story tape, parents' book, spectrum overlay and program, the aim is to teach the under sixes to recognise individual letters and words, stimulate language development, improve hand and eye coordination and prepare for first steps in reading.

To achieve this, four activities are used based upon matching pictures, colour, letters, pictures to words, three based on Snap and one producing words with pictures.

In Matching Pictures three pictures from the story appear to the left of a story character and one of them appears above the

row, that can be keyed to move and keyed to match. If the match is correct the character dances to music, but stamps a foot if wrong. Snap involves two characters on boxes upon which pictures or words appear that have to be snapped by keying in a coloured area on the overlay — correct responses causing the character to dance and a plant to grow and finally flower. Incorrect responses produce a similar response in the other character.

Sound and graphics is of such high standard that the child's attention is kept and it is drawn on to the next activity. Part of The Learning Box series. T.W.

instructions	85%
ease of use	90%
display	90%
value for money	90%



# Learning with your computer 1

## Our expert reviewers mark the report cards of five educational programs

native answers are given for each. I disagreed with a few of the right answers, but that may be because my physics is a little rusty; on the whole, the questions are quite well designed.

Three different "games" are offered: a fixed time for answering each question, a mind-master test where you have to answer as many as possible in two minutes, and an exam in which you have 10 minutes in which to answer all the

questions. At the end of each, questions answered wrongly are listed together with their right answers. There is also a revision mode, in which the questions and answers are displayed.

M.N.

instructions	70%
ease of use	70%
display	60%
value for money	60%



## Physics 1 Dragon 32 £6.90

N.W.B.C., 204 High St West, Sunderland, Tyne & Wear SR1 1UA

Multiple-choice tests come in many different guises these days. This one is more straightforward

than most — up to 50 questions on 'O'-Level/C.S.E. Physics. If you get them all right you are rewarded by seeing a little man walk across a desert to get a coconut from an oasis. I would have thought that by 'O'-Level, this kind of reward was a little superfluous.

Two batches of 50 questions are provided, covering four main branches of physics. Three alter-

## Decimals 32K BBC £

Chalksoft, 37 Wilowlea Rd, Worcester WR3 7QP

Designed for children of nine and over, this set of five programs provides a tutorial on decimal numbers graded from a simple start to relatively complex calculations in the final program.

Each of the five is self contained and may be used on its own. This will be useful in the classroom where pupils may each work on a different section under the teacher's guidance. Each program section contains a tutorial, where examples are worked in some detail, multiple choice questions where the answers are scored by the computer and a set of tests.

These tests are not scored, but answers are hidden until the space bar is pressed.

The teaching sections are well thought-out with clear and well animated displays. Between sections graphic displays and music will help to keep the younger students' attention. I could not defeat the error trapping and the programs all appeared to be perfectly bug-free. These two points are most important in programs designed for children.

A program that succeeds in its aim. J.G.W.

instructions	80%
ease of use	85%
display	80%
value for money	80%



## Mister Mac's Day 48K Spectrum £9.95

Five Ways, Arrow, 17-21 Conway St, London W1P 6JD

An ambitious program that might be too difficult for children of the target age group — up to eight — as it helps them to understand the passing of time, the reading of digital and analogue clocks and the 24-hour clock. Mr Mac is involved in seven activities requiring a lot of cueing from parents.

The first explores the working day with a large ringing alarm clock and scenes from the day. This is followed by cueing times to those scenes, and then a large alarm clock can be set to any time desired.

After this the activities become harder — although simple to follow, even without the pages in the review booklet — so I found it difficult to stop the train running around the track at the stations at set times shown by a central, analogue clock. 12pm would be better referred to as 12 noon — confusing for children. Correct arrivals makes a large train move half a carriage across the screen bottom.

A similar scenario is used to understand the digital watch with the child keying in the correct time — pity there is no facility to go backwards. Part of The Learning Box series. T.W.

instructions	100%
ease of use	85%
display	100%
value for money	90%



## Hansel and Gretel 48K Spectrum £9.95

Five Ways, Arrow, 17-21 Conway St, London W1P 6JD

The program aims to build a child's vocabulary, to develop an ability to build words and more complex letter combinations. Educationally, too much is

crammed into a graphically superb program where it would be wiser to separate practising modification of first vowel by a final '-e' from simple digraphs.

In Mend the Word Stepmother, Terrible Tree and Hansel and Gretel appear with red word endings below, with a squirrel pushing on black consonant blends. Keying blue moves the word beginning to the next group of letters, while keying pink joins the letters. If

incorrect Stepmother bangs her stick, but if correct the words fall down to musical accompaniment, while children wave and eventually the Tree frightens Stepmother.

A superb dissolve leads to Make a Word Snap, where words made up by the computer from initial consonant blends and word endings appear. Overlay areas keyed represent snap for the players — no scoring or flowering plants.

Another scene repeats each activity and Spelling completes the program, using the hangman technique, with Daddy chopping tree when letters are correct.

T.W.

instructions	90%
ease of use	90%
display	90%
value for money	85%





## Timeless Software

### TI 99/4A Extended Basic Software

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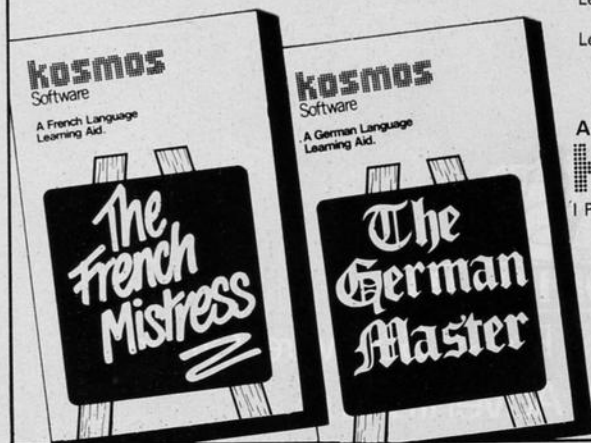
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## Program security

This program introduces some basics needed to incorporate a password in a program to discourage its unauthorised use.

A password can also be used to protect an entire computer system. Most multi-user or time sharing systems require a user to input a password to determine whether further facilities can be accessed.

When this program is RUN you will be asked to type in a password. If "MKXJ" is entered, a message indicating its acceptance will come up. You will then be shown the rest of the program, which is simply another message.

On the other hand, the program terminates with an appropriate message if the password is incorrect.

Note that we follow a clever process to disguise a character according to some rules.

ASCII is a widely used method of encoding characters. To find the ASCII value of a character one can look up a standard table, or as in our case, program the computer to do it, as shown in line 70.

**Multiply ASCII Value by Place Value.** This is the next step in the detective trail and it is implemented by line 80.

The place value of a character refers to its position in a word. For "MKXJ", the place value of "M" is 1, "K" is 2, "X" is 3 and "J" is 4.

As an illustration of how it is carried out let us look at what happens when "K" is processed. Since its ASCII value is 75 and its place value is 2, the product is (75 x 2) or 150. We have assumed, of course, that a user inputs the correct password, "MKXJ".

Why is this necessary? One reason is to avoid accepting variations of the password such as "KMXJ" or "KXMJ".

**Add to Progressive Sum.** To keep track of calculations as the loop is repeated, the answer in the last step is added to the Progressive Sum (PS) as line 90 shows.

The table shows the changes during the four cycles of the loop.

Cycle	Character	Place Value	ASCII Value	ASCII Value * Place Value	PS
—	—	—	—	—	0 (before loop)
1	M	1	77	77x1 = 77	77( 0+77)
2	K	2	75	75x2 = 150	277( 77+150)
3	X	3	88	88x3 = 264	491(227+264)
4	J	4	74	74x4 = 296	787(491+296)

Changes during four cycles

# Keep your secrets... find out how much you'll make

Two useful programs by Tom Lau for the unexpanded VIC-20. Both are from his book, **Putting Your VIC-20 to Work**, just out from Interface Publications

## Changes during four cycles

**All characters done?** We must accept four, and only four, characters. This means the loop must be executed four times.

Note that this step is part of the Repeat-Until loop. There are many ways of implementing it, but we have chosen FOR... STEP... NEXT

The important point to make about a FOR loop is that when line 100 (NEXT KC) is executed, it automatically checks whether the required number of cycles (same value as number of characters) is done and either proceeds to the next instruction or repeats the loop. Line 100 is the instruction for this step.

**Is Progressive Sum = 787?** We have now come out of the loop and have to check whether the Progressive Sum we have obtained is the same as the expected value, 787. This is the aim of this step and line 110.

## Variables

**PS** Progressive Sum of (ASCII value of a character multiplied by its place value)

**KC** is a counter and doubles as place value

**CHS** input character

**CV** Converted Value is the value after multiplying ASCII value and place value.

**CH** the ASCII value of CHS

There is one constant:

**NC** Number of Characters in the password

**VC** converted value is the value

**NC** number of characters in the password

## Investment

If you can work out the following problem in 60 seconds, this program is absolutely of no use to you.

How much money would accrue after 5 years if you were to leave, at 12 per cent a year, the following amounts in the bank?

£100  
£150  
£200  
£250  
£300  
£350  
£400

Beaten by the clock? Not to worry! We must admit you are at a disadvantage right from the start.

The time of 60 seconds is roughly what it takes our program to RUN and produce

## How it works

- CHRS (147) clears the screen and brings the cursor home (top left corner). "PASSWORD?" also appears
- The constant NC is initialised to 4 since there are four characters in the password "MKXJ". If you wish to alter the password, this is one of the lines you have to change
- PS, a variable, must be zeroed in preparation for the calculations in the loop to follow
- 100 loop which processes the input characters
- determines the number of cycles (times) the loop must be done. In this case there must be four cycles. What it means is that it starts with KC=1 and increases it by 1 (STEP size is 1) after each cycle until KC passes 4, the limit
- a typed character is transferred to location identified as CHS
- tests whether a character has been typed. If it has not, then the program returns to line 50. "" represents the null character
- At this point a character must have been received. It is then converted to its ASCII value using ASC (CHS) and placed in a location named CH
- the values in CH and KC are multiplied and the result put into location CV. \* is the multiplication symbol in BASIC
- takes the values in PS and CV, adds them and puts the result back into PS. Note that after this instruction is completed, the former value of PS is lost, being replaced by the new value
- increments the value in KC by 1 (since STEP size is 1) and compares it with the value in NC. If the KC value exceeds the NC value, then the program continues with next instruction 110; otherwise it returns to 50 for another loop cycle.
- it has now come out of the loop. 787 is the pre-calculated or expected value for the password "MKXJ". 787 is compared with the value in PS, and if they are the same then the program continues at instruction 140. Note that whenever the password is changed, the value 787 has to be changed.
- to reach this point, the input password must have failed the test in 110; so an appropriate message is in order
- directs the program to 160 which terminates the program
- only with the correct password can the program arrive at this instruction, which displays the message "PASSWORD O.K."
- is a one-line program for the bona fide user to see
- terminates the program

## VIC-20 PROGRAMS

### How it works

- 10 defines LNS and DLS  
 20 clears the screen and brings the cursor home  
 30-40 print the prompt message  
 50 waits, with a flashing question mark, for a user to type in one or more numeric characters(s). When the return key is pressed, this (these) is (are) stored in location IL  
 60 prints whatever is stored in LNS, i.e. 60 runs a line across the screen  
 70 prints the enclosed prompt  
 80 waits and stores numeric character(s) in location IH  
 90 see 60  
 100-110 print another prompt  
 120 waits for and stores a number in SZ  
 130 see 60  
 140-150 print another message  
 160 waits for and stores a number in IY  
 170 see 60  
 180-190 print the enclosed prompt. Observe the user example which is intended to remind the user not to enter a "%" after a number  
 200 number entered is stored in IR  
 210 prints a double line on the top of the headings  
 220 prints headings  
 230 prints another double line  
 240 IV, the invested amount, is initialised to IL, the low limit. This gives the first invested value in a table  
 250 the calculations on the right hand side are carried out and the result put in location RT. The temporary answer is then raised to the power of IY to give a second temporary answer which is finally multiplied by IV  
 260 prints the values of IV and INT(RT). Note that INT(RT) disregards the fraction after the decimal place of RT. For example, if RT is 345.67 then INT(RT) is 345  
 270 see 60  
 280 increases the value of IV by SZ and then compares the values of IV and IH. If IV is greater than IH (i.e. it is true that IV is greater than IH) the program gets out of the FOR loop and goes to the next instruction which is 290; otherwise it goes back to 250  
 290 stops the program

the answers in a table just like the one below.

invested	return
100	176
150	264
200	352
250	440
300	528
350	615
400	704

The smallest invested value, 100 is called a low limit and the largest, 400, a high limit. The difference, 50, between one invested value and the next is called an interval or a step size.

To produce a table to your requirements our program needs a value for low limit (IL), high limit (IH), step size (SZ), interest rate (IR) and years of investment (IY). When the program is RUN you will be asked when to enter these values.

The values used to obtain our table are:

IL = 100, IH = 400, SZ = 50, IR = 12 and IY = 5

● Putting Your VIC-20 to Work, £4.95, from Interface Publications, 9-11 Kensington High Street, London W8 5NP. The book includes another 13 programs, plus a teach-yourself course in BASIC programming

```

40 PRINT "VALUE,LOW LIMIT."
50 INPUT IL
60 PRINT LN$
70 PRINT "ENTER HIGH LIMIT."
80 INPUT IH
90 PRINT LN$
100 PRINT "ENTER STEP SIZE."
110 PRINT "OF TABLE."
120 INPUT SZ
130 PRINT LN$
140 PRINT "ENTER YEARS OF"
150 PRINT "INVESTMENT."
160 INPUT IY
170 PRINT LN$
180 PRINT "ENTER RATE OF"
190 PRINT "INTEREST(EG 12.5)"
200 INPUT IR
210 PRINT DL$
220 PRINT "$ INVESTED/$ RETURN"
230 PRINT DL$
240 FOR IV=IL TO IH STEP SZ
250 RT=IV*(1+IR/100)^IY
260 PRINT IV,INT(RT)
270 PRINT LN$
280 NEXT IV
290 END
    
```



### Variables

IV is money invested, which ranges inclusively between IL and IH  
 RT is the money returned for an invested amount  
 There are seven constants:  
 IL is a low limit  
 IH is a high limit  
 SZ is a step size  
 IY is years of investment  
 IR is annual interest rate  
 LNS is a line used for screen  
 DLS is a double line used for the same purpose

```

1 REM BY TOM LAU
2 REM -----
3 REM PROGRAM:
4 REM SECURE YOUR PROGRAM
5 REM -----
6 REM COPYRIGHT
7 REM -----
10 PRINT CHR$(147)"PASSWORD?"
20 NC=4
30 PS=0
40 FOR KC=1 TO NC STEP 1
50 GET CH$
60 IF CH$="" THEN 50
70 CH=ASC(CH$)
80 CV=CH*KC
90 PS=PS+CV
100 NEXT KC
110 IF PS=787 THEN 140
120 PRINT "WRONG PASSWORD"
130 GOTO 160
140 PRINT "PASSWORD OKAY."
150 PRINT "PROGRAM CONTINUES HERE"
160 END
    
```

```

1 REM BY TOM LAU
2 REM -----
3 REM PROGRAM:
4 REM INVESTMENT EVALUATION
5 REM -----
6 REM COPYRIGHT
7 REM -----
10 LN$="-----":DL$="
===== "
20 PRINT CHR$(147)
30 PRINT "ENTER INVESTMENT"
    
```

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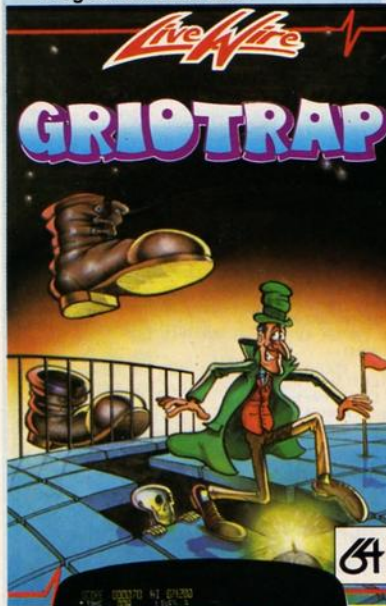
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## SPECTRUM PROGRAM

### How it works

1-100 define variables  
 105-155 set up screen display  
 160-185 move sight, fire laser  
 190-220 display sight  
 225-300 draw laser fire, detect hits  
 305-320 print explosions when aliens hit planet  
 1000-1055 define graphics  
 2000-2040 draw screen  
 3000-3050 end of game routine  
 4000-4030 bonus fuel  
 5000-5025 explosions at screen hits  
 6000-7005 instructions

To Attack is a graphic space game for the 48K Spectrum, easily altered for the 16K version.

The object of the game is to prevent the aliens landing on your planet and destroying the cities.

The planet is guarded by a defence screen which, at the start of the game, completely surrounds the cities. Aliens which hit the screen destroy themselves — and part of the screen.

So if you are not careful aliens will reach the cities through the gaps made by their comrades.

Your laser, aimed with the control keys and fired with the F key, has a limited amount of energy. You gain more for

# Race to your laser... here come the Qwertons!

**You've only got to turn your back for a minute and the aliens are on us again. Type in Andrew Armstrong's program and your Spectrum becomes your planet's only defence**



### Variables

X,Y position of sight  
 A,V position of alien  
 Sc score  
 Bo bonus  
 Ti time (counter for fuel)  
 Ch random alien  
 AS string for different aliens

each wave of Qwerton craft destroyed.

**Note:** the keyboard BEEP can be increased by POKE 23609, 100 which can help speed up data entry. And the speed of the repeat on the keys can be increased by POKE 23561,5 and POKE 23562,5.

• Unless text, capital letters in PRINT statements should be entered in GRAPHICS mode.

### Hints on conversion

Transferring this game to the 16K Spectrum simply requires changing the address of the user-defined graphics.

For users of other computers, the commands mean:

**BEEP** the Spectrum's simple sound command

**PLOT, DRAW** are graphics commands used in simple vector form

**PRINT AT** prints the character at specified screen position

**SCREENS** reads that position on the screen

```

1 LET HI=0
2 LET Z=0
3 LET U=0
5 REM 10 ATTACK Andrew Armstrong 1983
10 GO SUB 1000
12 GO SUB 6000
15 GO SUB 2000
20 LET TI=0
25 LET SC=0
30 LET Y=15
35 LET X=15
40 LET BO=150
42 LET H=1
45 LET A=1
50 LET V=RND*28
55 IF V<15 THEN LET H=0
60 LET A$="BA CED"
65 LET C=RND*20
70 LET S=1
75 LET T=2
80 LET CH=RND*20
85 IF CH>10 THEN LET S=3: IF CH>10 THEN LET T=4
90 IF CH>12 THEN LET S=5: IF CH>12 THEN LET T=6
95 IF CH>14 THEN LET S=7: IF CH>14 THEN LET T=8
100 IF CH>16 THEN LET S=11: IF CH>16 THEN LET T=2
105 REM MAIN PROGRAM
110 IF ATTR (6+2,V)=33 THEN GO TO 3000
115 IF V>28 THEN LET H=0
120 PRINT AT 18,0; INK 3; " ";AT 18,12; INK
1;"EEEEEE";AT 18,19; INK
31 "
125 PRINT AT 19,0; INK 3; "
"
130 IF U<>1 THEN PLOT 255-TI,175: DRAW 0,-8
135 LET TI=TI+5
137 IF TI>160 THEN LET Z=1
139 IF TI<160 THEN LET Z=0
140 IF TI>200 THEN LET U=1
145 LET A=A+1
150 PRINT AT A,V;A$(S TO T)
152 IF ATTR (A+1,V)=34 THEN GO TO 5000
155 PRINT AT Y,X;" "
160 IF INKEY$="6" THEN LET Y=Y+1
165 IF INKEY$="7" THEN LET Y=Y-1
170 IF INKEY$="5" THEN LET X=X-1
175 IF INKEY$="8" THEN LET X=X+1
180 IF INKEY$="F" AND U<>1 THEN GO SUB 225
    
```

```

182 IF INKEY$="f" AND U<>1 THEN GO SUB 225
185 IF A>16 THEN GO TO 305
190 IF V<2 THEN LET H=1
195 BEEP .01,10; BEEP .01,40
200 PRINT AT Y,X; PAPER 4; INK 7; BRIGHT 1; "+"
202 PRINT AT 20,24; HI
205 PRINT AT A,V;" "
210 IF H=1 THEN LET V=V+1
215 IF H=0 THEN LET V=V-1
217 PRINT AT 0,0; FLASH 2;"FUEL"
220 GO TO 105
225 REM LASER FIRE
230 PLOT 51,32: DRAW INK 7; (X-6)*8, (17-Y)*8
235 PLOT 199,32: DRAW INK 7; (X-24)*8, (17-Y)*8
240 BEEP .01,-10; BEEP .01,40; BEEP .01,10; BEEP .01,-
10
245 IF INT a<>INT y AND INT v<>INT x THEN PLOT OVER
1;51,32: IF INT a<>INT y
AND INT v<>INT x THEN DRAW OVER 1; (X-6)*8, (17-Y)*8
250 IF INT a<>INT y AND INT x<>INT v THEN PLOT OVER
1;199,32: IF INT a<>INT y
AND v<>x THEN DRAW OVER 1; (X-24)*8, (17-Y)*8
255 IF INT a<>INT y AND INT v<>INT x THEN RETURN
260 FOR N=1 TO 10: BEEP .01,N; BEEP .01,N+5; NEXT N
265 PRINT AT Y,X-1; PAPER 3; INK 7; BRIGHT 1;"FFFF"
270 LET SC=SC+10
275 PRINT AT 20,6;SC
280 IF SC>80 THEN GO SUB 8000
285 PLOT OVER 1;51,32: DRAW OVER 1; (X-6)*8, (17-Y)*8
290 PLOT OVER 1;199,32: DRAW OVER 1; (X-24)*8, (17-Y)*
8
295 PRINT AT Y,X-1;" "
300 GO TO 45
305 REM PLANET FALL
307 PRINT AT 20,24; HI
310 IF SCREEN# (A+1,V)=CHR# 149 THEN GO SUB 3000
315 PRINT AT A+1,V;"FFFF"
317 PRINT AT A,V-1;" "
320 FOR N=1 TO 3: NEXT N: PRINT AT A+1,V; INK 3;" "
: GO TO 45
1000 FOR N=65368 TO 65440: READ A: POKE N,A: NEXT N
1005 DATA 140,220,248,224,190,226,64,64
1010 DATA 49,56,31,7,125,71,2,2
1015 DATA 220,252,254,255,127,254,218
1020 DATA 195,36,24,165,126,119,56,195
1025 DATA 0,93,42,62,28,8,8,8,8
    
```

## SPECTRUM PROGRAM

```

1030 DATA 145,82,0,3,192,0,74,145
1035 DATA 140,51,64,92,32,81,66,34
1040 DATA 25,100,130,34,130,68,42,34
1045 DATA 149,18,97,129,10,12,74,180
1050 DATA 20,20,50,33,148,78,132,99
1055 RETURN
2000 REM SCREEN DISPLAY
2005 PAPER 0: BORDER 0: INK 0: CLS
2010 PLOT 24,24: DRAW INK 2:207,0,-PI/2
2015 PLOT 22,24: DRAW INK 2:211,0,-PI/2
2020 PRINT AT 20,0:"SCORE" HI
2025 PRINT AT 0,0:"FUEL":AT 0,7:"PAPER 7:"
"
2027 PLOT INK 0;0,167: DRAW INK 0;255,0
2030 PLOT 44,7: DRAW 0,9: DRAW -44,0: DRAW 0,-9: DRAW 1
88,0: DRAW 0,9: DRAW -188
,0: DRAW 255,0: DRAW 0,-9: DRAW -255,0
2035 PLOT 56,175: DRAW 0,-8
2040 RETURN
3000 REM CITIES DESTROYED
3005 PRINT INK 7: PAPER 4:AT 17,12:"GHGHGHG"
3010 PRINT INK 7: PAPER 4:AT 18,12:"JIJIJIJ"
3012 BEEP .3,-5: BEEP .4,0: BEEP 1.2,-20
3030 FOR n=1 TO 44 STEP 4: BORDER RND*7: BEEP .01,n: BE
EP .01,n+4: PLOT INK 7:(
245/2)+n,32: PLOT INK 7:(245/2)+n,32+n: PLOT INK 7:(2
45/2),32+n: PLOT INK 7:(
245/2)-n,32+n: PLOT INK 7:(245/2)-n,32: PLOT INK 7:(2
45/2)+(2*n),32+n: PLOT I
NK 7:(245/2)-(2*n),32+n: PLOT INK 7:(245/2)+(3*n),32+(
2*n): PLOT INK 7:(245/2)
-(3*n),32+(2*n): NEXT n
3033 IF SC>HI THEN LET HI=SC
3034 LET U=0: PAUSE 100: PAUSE 10
3035 CLS
3040 PRINT AT 10,3:"PRESS ANY KEY TO RESTART"
3045 IF INKEY#<>" " THEN GO TO 15
3050 GO TO 3045
4000 REM BONUS FUEL
4005 PRINT AT 10,10:"BONUS FUEL"
4010 FOR K=TI TO TI-100 STEP -1: PLOT INK 7:255-K,168:
DRAW INK 7;0,7: BEEP .0
1,(500-K)/10: NEXT K
4015 LET TI=TI-100
4020 LET BD=BD+100
4025 PRINT AT 10,10:"

```

```

4030 RETURN
5000 REM SHIELD HIT
5005 PRINT AT A+1,V;"FFFF"
5010 BEEP .01,30: BEEP .01,10
5015 PRINT AT A,V;" "
5020 PRINT AT A+1,V;" "
5025 GO TO 45
6000 PAPER 0: INK 7: BORDER 0: CLS
6005 PRINT AT 3,3:"10 ATTACK"
"
6010 PLOT 20,142: DRAW 76,0
6015 PLOT 0,126: DRAW 222,0
6020 PRINT AT 7,1:"YOUR PLANET IS UNDER ATTACK BY THE D
EADLY DWERTONS OF 10."
"
YOUR ONLY CHANCE TO SURVIVE IS TO DESTROY THE DWERTON C
RAFT BEFORE THEY HIT Y
OUR CITIES."
6025 PRINT AT 19,2: FLASH 1:"PRESS ANY KEY TO CONTINUE"
6027 PAUSE 10
6030 IF INKEY#<>" " THEN GO TO 6040
6035 GO TO 6030
6040 BEEP .1,10: BEEP .2,0: CLS
6045 PRINT AT 1,0:"YOUR CITIES ARE DEFENDED BY A ENER
GY BARRIER WHICH DESTROYS
ANY CRAFT WHICH TRIES TO PENE TRATE IT."
"
THE DES
TRUCTION OF THE CRAFT
ALSO DESTROYS THAT PART OF THE DEFENSE BARRIER."
6050 PRINT AT 12,0:"THE AMOUNT OF ENERGY YOU HAVE IS
LIMITED,ALTHOUGH EXTRA EN
ERGY CAN BE GAINED BY DESTROYING EACH WAVE OF DWERTO
N CRAFT."
6055 PRINT AT 19,3: FLASH 1:"PRESS ANY KEY TO CONTINUE"
6060 PAUSE 10: IF INKEY#<>" " THEN GO TO 6070
6065 GO TO 6060
6070 BEEP .1,10: BEEP .2,0: CLS
6075 PRINT AT 5,0:" THE SIGHTS OF YOUR LASER ARE COTR
OLLED BY THE CURSOR CONTR
OL KEYS: -"
6080 PRINT AT 10,0:"THE ""F"" KEY IS USED TO FIRE"
6085 PRINT AT 15,0:"UP DOWN RIGHT LEFT FIRE"
6090 PRINT INK 0: PAPER 7:AT 16,0;" 7 6 8
5 F "
6095 PRINT AT 19,2: FLASH 1:"PRESS ANY KEY TO BEGIN"
7000 IF INKEY#<>" " THEN GO TO 15
7002 IF INKEY#<>" " THEN GO TO 15
7005 GO TO 7000

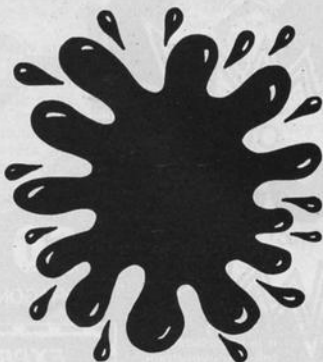
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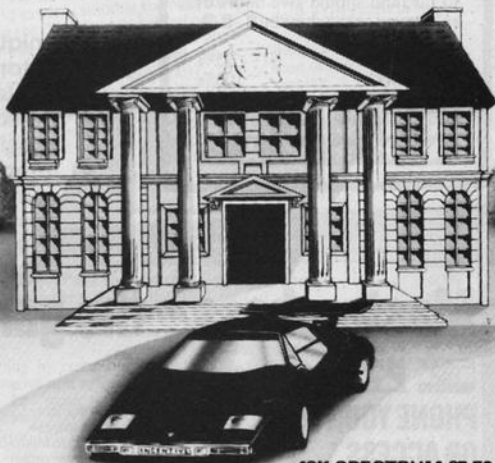
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# It was the best then...

Chess-players with a 48K Spectrum will find this program ideal if they are stuck for a partner.

I have seen other chess games for computers, but as far as I am concerned, this is the best so far, and should give hours of enjoyment to the chess buff. **B.B.**

instructions	95%
playability	100%
graphics	75%
value for money	100%



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# Learning with your computer 2

Are these likely to help your child? Our experts examine another batch of educational software

## Wordmaker/ Listmaker Spectrum 48K £7.50

IMS, 143-145 Uxbridge Rd, London W13 9AV

"Develop spelling, reading and vocabulary skills". Suitable for ages five to 12, covers: Simple three-letter blends, initial consonant blends, final long

vowel, silent 'e' rule, confusable vowel combinations, initial consonant diagraphs, initial and final consonant combinations, 'al' as 'aw', confusable endings, suffix 'er' irregular sounds: with 12 word-lists.

A pre-selected word-list covering an area of difficulty is loaded, the display shows certain fixed letters intermingled with vertical, movable bands of vowels, consonants or the alphabet, i.e. The child cursor

instructions	85%
ease of use	85%
display	90%
value for money	85%



## The Enormus Turnip 48K Spectrum £9.95

Five Ways, Arrow, 17-21 Conway St, London W1P 6JD

Three activities introduce spelling, that letters have sounds as well as names, and that words are formed by adding the right letter sounds together. In Letter Sounds an old man stands by a turnip above three pictures while a mouse pushes the first letter of the name of one of the pictures. It can be keyed to move or 'in'. When correct, mouse somersaults and man waters turnip which grows. If wrong mouse faces child with a question mark above its face.

Word Making finds the old man pulling out the enormous turnip with a mouse pushing the

first letter of one of three incomplete words below him. Keying and reinforcements are as before, but each correct response brings assistance for the old man.

A cooking pot below a shelf with a mouse pushing a turnip appear in Spelling with a picture of the object to be spelled and turnips in place of letters. A mouse, keyed to move left or right, selects letters. Correct responses cause the turnip to be pushed towards the pot, to fall in after five correct. If wrong the questioning mouse returns, the word is spelt out and vanishes to be copied by the child.

T.W.

instructions	85%
ease of use	85%
display	90%
value for money	85%



## Optics 32K BBC £9.99

Compusoft, 32 Watchyard La, Formby, Lancs L37 3JU

A set of some 16 programs on one cassette which aim to help a student at Physics 'O'-Level standard understand optical science. They take much the same form as a book, being divided into sections with

relevant diagrams within the chapter.

The graphics are no substitute for good practical demonstrations. The quality of the diagrams is not high and the choice of colours leaves something to be desired — white on yellow does not show up well — and little use has been made of animation.

Whilst the subject matter is there, it's presentation is not stunning. I noticed several

spelling mistakes and some of the screen layouts need de-bugging. I particularly disliked a screen reply that pronounced: "You did bad".

Teaching by computer should be innovative and refreshing, use should be made of colour, sound, animation — all the things you can't get from the printed page. Why write a book and then show it on the screen? That is all this set of programs has really achieved.

J.G.W.

instructions	60%
ease of use	80%
display	50%
value for money	20%



## Five Little Ducks 48K Spectrum £9.95

Five Ways, Arrow, 17-21 Conway St, London W1P 6JD

One of two early number learning packages for under sixes that involves listening to a rhyme tape while reading the book, and then a program to teach sorting and matching, meaning of numbers, develop concepts of counting, giving practice in recognising and understanding numbers up to five, and makes counting fun. There are five activities in each of the two sections: number and counting.

Activity one uses clear graphics of two homes, such as a cake and car park, with a candle and a car appearing above before going to their appropriate homes. Then one appears, and

keying the correct area on the overlay causes it to go to its home — if correct the candle lights and wax runs down the side, or the car turns. Incorrect answers cause a failure sound and awaits a new input.

Other activities follow the same format, high standard of graphics and use of sound, leading to the final lake scene where keying in the number outlined on the lake causes that number of ducks to land on the water. The program cannot be fooled by keying in the wrong number — too many cause the extra ducks to fly away and too few cause the task to restart.

T.W.

instructions	85%
ease of use	90%
display	90%
value for money	85%



moves the first vowel 'a' into position, and then moves the alphabet. When he recognises a word, he presses Enter. If right, he gets a tick, a 'yes', and a little head climbing a score pole, otherwise 'not found' and 'x'. Number of words findable is displayed and Help shows unfound words.

Side 2 allows you to compile your own word-lists.

Getting to the Main program without the long, two-letter words demo seems impressive.

D.C.

instructions	90%
ease of use	85%
display	90%
value for money	90%



## Alphabet 32K BBC B £9.95

Opal Soft, 112 Arterial Rd, Eastwood, Leigh-on-Sea, Essex SS9 4DG

Colour, sound, movement, it's got the lot. This is a very well written program which can't fail to fascinate children.

As far as educational use goes, I'd say it is suitable for ages four to six. The child has to recognise what the picture shows and press the first letter of the word, e.g. u for umbrella. Generally the pictures are excellent: a beautiful ballerina, a pirate complete with parrot and so on. The police box was good but it didn't respond to "p" — of course it should have been "t" for tardis!

When you get it right a short musical and often animated scene follows: the rocket takes off, rain falls on the umbrella, etc. All this very impressive action, although the brightly coloured booklet gives pictures for all 26. Indeed, the booklet is educational in its own right.

For those children learning or practising the alphabet this is a delightful asset. It may not be the cheapest program, and its scope is undeniably limited, but programmer D. J. Millidge has done a first-class job.

B.J.

instructions	90%
ease of use	85%
display	95%
value for money	85%



## Datext 32K BBC £6.95

Optima, 36 St Petersgate, Stockport SK1 1HL

Two programs which combine to provide a Teletext-like system for display. The first program creates and then allows editing of the pages. Unlike most of other teletext editors I've used, this one doesn't use the function keys to place the control codes on the screen. Instead it uses the normal keys when CTRL is pressed too.

At first I thought this would be difficult but as the codes are well thought out — for example, CTRL/C gives 'Colour change, CTRL/G 'Graphics' — they are easier to use and they can be learned very quickly. The only criticism I have of this section is that you have to type all double height text twice, others do this automatically.

The control program is not so good, however, as the number of options one has is very limited. It only gives two alternatives: cyclic display, with each page on screen for up to 30 seconds before the next appears, or selective with a user typing the page number wanted.

This is not very flexible. I have used better control programs which allow a mixture of the two using the arrow keys to move forward and back at will. Reasonable value. Should be considered if you need dynamic displays. Disc version: £10.95.

D.C.

instructions	65%
ease of use	85%
display	70%
value for money	70%



# Are these any use to you?

## HCW's experts look at utilities for the BBC micro, Dragon, Spectrum and Oric

### Keys 32K BBC £2.99

Compusoft, 32 Watchyard La, Formby, Lancs L37 3JU

Do you want single keyword entry for your Beeb? Then this might be what you need, once it has been de-bugged. The idea is to provide six separate sets of

keyword definitions to fit into the function keys.

Drawbacks are that part of the screen is lost and 2K is taken. This is where the major bug lurks. To fit in all the key definitions memory is set aside, on a cassette-based system, from Page upwards resulting in Page being reset at &1600. The result is that the program tries to assemble the definitions into the

middle of itself!

The program is in BASIC and the only instructions are in REMS. These are not always useful, particularly as the program seems to have been renumbered and the REMs do not always refer to the correct line. I found an unused line which points to the program being rushed out. The disc systems seem problem-free. But it was still quicker to type in the keyword.

Useful and good value — once debugged.

J.G.W.

instructions	20%
ease of use	60%
display	80%
value for money	65%



### Shaper Dragon £9.95

Shards, 189 Eton Rd, Ilford, Essex

An impressive utility. Use it to create sound effects for your games. Also included is a BASIC loading routine that may be merged into your own programs for simplicity of loading those games. An added bonus is a useful screen invert sub-routine.

Well thought-out, a great deal of effort has obviously been put not only into the programming but also into the presentation. When the video cassette-style box is opened you can see what these flashy packages are made for. Not so with many other large boxes where you have to send out a search party to find the software.

Here there is the program cassette, a complimentary blank tape and comprehensive 34-page manual.

There are 100 pre-defined sounds already built in and you may use these or alter them to your heart's content by changing a set of parameters. The sound effects are excellent and you can get some pleasure out of just listening to them and playing about with the variables. However, the real beauty is using these sounds in your own programs.

D.W.J.

instructions	95%
ease of use	85%
display	85%
value for money	90%



### Toolkit Spectrum £8.95

IMS, 143-145, Uxbridge Rd, London W13 9AV

Offers automatic line numbering, block delete, clock, directory, erase, change lower or upper case, memory status, POKE, renumber, slow, trace, vardump and scroll prompt turnoff. Providing them is another story.

Many facilities are common to most toolkits; the unusual ones being directory: play a cassette of programs and it prints to screen or printer, giving type (BASIC or machine code), title, byte size and memory needed, and address of every program. NEW is disabled, erase substituting and retains variables when used. POKE prints the first POKEable address in normal REM lines.

Functions are called by pressing space and a letter, possibly entering several POKES at the same time, very clumsy to use. No information on where the program sits in memory, its size, or if you should LOAD or MERGE your own program. Autounumber requires a key press every line. Since you must press a key to turn it off, you get unwanted lines. Clock is accurate to minute only.

My old debugged and reliable test program did most amazing things and a block delete on four lines vanished the whole program. Even without bugs, there are toolkits with more facilities and easier operation. Packaging was nice.

D.C.

instructions	50%
ease of use	40%
display	30%
value for money	30%



### Toolkit 48K Oric £8.95

IMS, 143-145 Uxbridge Rd, London W13 9AV

A neat "wedge" program allowing access to 14 extra BASIC statements, including most of the expected toolkit commands such as renumbering, automatic numbering and deleting lines. In addition the program effectively upgrades the

Oric-1 to Atmos standard by adding PRINT AT, VERIFY and APPEND, as well as the simple file handling commands WRITE and READ. These function as the Atmos STORE and RECALL.

The program also includes RESTORE to a particular line number, CATALOG — displays contents of a cassette tape — and a simple method of redefining any of Oric's standard characters.

Toolkit can be loaded without disturbing a resident BASIC program and resides at top of user memory allowing normal use of HIREs mode. Most of the additional commands can be used in immediate or program mode.

A disappointment was that no facility for searching a program for a particular statement is provided. However, you rarely seem to get everything you could wish for these days. What is

included seems to work very smoothly. The serious BASIC programmer should definitely have something like Toolkit available, and the additional range in-program commands is very attractive.

P.S.W.

instructions	85%
ease of use	90%
display	N/A
value for money	80%



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Computer Tutor: A member of the Argus Press Software Group.  
No 1 Golden Square, London W1R 3AB.

1984/85

# Are you good enough for the shuttle pilot's Hall of Fame?

In this game, Shuttle Pilot, you are in control of a space shuttle which has suddenly lost control and is losing altitude rapidly. Your task is to bomb the derelict city below you totally flat in order to land your shuttle which has many passengers aboard.

Will you be a good enough pilot to enter your name in the Hall of Fame?

## Hints on conversion

It should be very easy to convert this program to run on other machines, however, here are a few hints to help you!

Replace PROCxxx with GOSUB, DEFPROC with a REM statement, ENDPROC with RETURN.

Replace REPEAT UNTIL loops with GOTOS unless you've got an Oric, or Sord with BASIC-G.

VDU17, X chooses colour X

VDU31,X,Y, is equivalent to PRINT TAB (X,Y) or PRINT AT (X,Y).

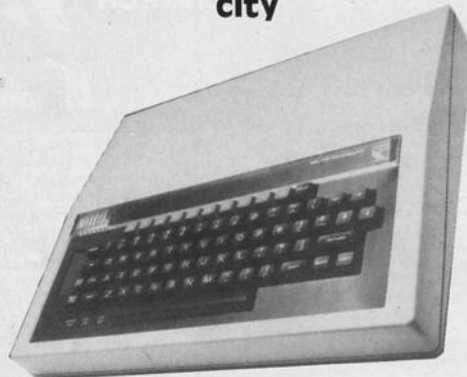
? is equivalent to PEEK.

\*FX210,1 turns all the sounds off.

\*FX210,0 turns sounds back on.

The short machine code routine assembled at the end of the program is a simple routine which returns the ASCII code of character at the current cursor position.

An arcade-type game to test your reflexes from Shingo Sugiura. You're the pilot of a space shuttle and the only landing place is in a derelict city



```
10REM Shuttle pilot V2
20REM By Shingo Sugiura
30REM
40
50PROCass
60PROCdefine
70MODE7:PROCinit
80REPEAT
90MODE2:VDU23;10,32;0;0;0;
100score%=0:screen%=0
```

## How it works

10-30 REM statements  
50 call a PROCEDURE which assembles a short machine code routine  
60 call a PROCEDURE which defines characters  
70 call a PROCEDURE which prints the instructions  
80-130 main loop  
150-330 the game itself  
340-430 a PROCEDURE to set up the screen  
440-470 drop bomb  
480-530 crash!  
540-590 new screen  
680-710 initialise variables  
720-740 delay PROCEDURE  
750-950 instructions  
960-1220 Hall of Fame feature  
1230-1450 define characters and envelopes  
1460-1560 Assemble machine code routine

Note: This program will also work on a machine fitted with a disc interface without any modifications.

## Main Variables

XC% X and Y co-ordinates of the shuttle  
score% score  
crashed a Boolean variable which indicates whether the shuttle has crashed or not  
BX%,BY% X and Y co-ordinates of the bomb  
plane\$ the shuttle

```
110PROCgame
120MODE7:PROCTable
130UNTIL FALSE
140
150DEFPROCgame
160REPEAT
170PROCinit
180PROCscreen
190REPEAT
200COLOUR1
210PRINTTAB(XC%,YC%);plane$
220IF INKEY(-99) AND NOT bomb THEN PROCdrop
230IF bomb PROCdraw_bomb
240PROCwait(200)
250SOUND&11,-5,50-YC%,1
260PRINTTAB(XC%,YC%) " "
270XC%=XC%+1
280PROCfind(XC%+1,YC%):IF ?&70<>32 THEN crashed=TRUE
290IF XC%>19 THEN PRINTTAB(XC%,YC%) " " :YC%=YC%+1:XC%
%=0
300UNTIL YC%=30 OR crashed
310IF crashed THEN PROCcrash ELSE PROCnew_screen
320UNTIL crashed
330ENDPROC
340DEFPROCscreen:CLS
350VDU17,3,31,0,0,234,235,236,237,238:PRINT":":score%
:VDU31,13,0,0,239,240,241,238:PRINT":":screen%
360COLOUR7
370FOR X=2 TO 18
380FOR Y=RND(10)+(23-screen%*3) TO 30
390PRINTTAB(X,Y)CHR#224
400NEXTY,X
```

```
410COLOUR2
420FORX=0 TO 18:PRINTTAB(X,31)CHR#228;:NEXT
430ENDPROC
440DEFPROCdrop
450BX%=XC:BY%=YC%+1
460bomb=TRUE
470ENDPROC
480DEFPROCcrash:COLOUR1
490SOUND0,1,6,20
500PRINTTAB(XC%,YC%);plane$
510VDU19,0,7,0,0,0:PROCwait(500):VDU19,0,0,0,0,0
520PROCwait(30000)
530ENDPROC
540DEFPROCnew_screen:COLOUR1:SOUND0,-10,6,255
550FORho=0TO16
560PRINTTAB(ho,(YC%-1)land$:PROCwait((ho+5)*50):PRINT
AB(ho,YC%) " "
570NEXTho:PRINTTAB(17,(YC%);plane$;TAB(17,(YC%-1)) " " :
SOUND&10,0,1,1
580PROCwait(10000)
590ENDPROC
600DEFPROCdraw_bomb
610PRINTTAB(BX%,BY%) " "
620BY%=BY%+1
630PROCfind(BX%,BY%)
640IF ?&70<>32 THEN SOUND&10,-10,1,1:score%=score%+10
:VDU17,3,31,6,0:PRINT:score%
650IF BY%>30 bomb=FALSE:ENDPROC
660VDU17,6,31,BX%,BY%:PRINTCHR#227
670ENDPROC
680DEFPROCinit
690XC%=0:YC%=2
700bomb=FALSE:crashed=FALSE:screen%=screen%+1
710ENDPROC
```



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**Marklist  
32K BBC £6.95**

Optima, 36 St Petersburg, Stockport SK1 1HL

Obviously intended for teachers, this database could do a valuable job if it fits your specification. Unfortunately it doesn't fit mine nor does it satisfy any of the other teachers to whom I have shown it. The main reason: its failure to accept more than one score per pupil, needed in most subjects where there may be more than one assessment criteria. For example, English where language and literature scores may need to be combined to find an average.

In the program's favour is its vast capacity, being able to accept the results of a full year

group at one go. Another good point is the range of mathematical functions built in, including the ability to calculate the percentage score for the pupil (from the raw score) and calculation of the standard deviation of each group as well as the whole year.

Another good feature is the 'zeroing' facility, eliminating the need to re-type all the names for a different subject's scores. Overall, the program has a great deal to offer but could have been so much better if extended. Also available on disc at £10.95. D.C.

instructions	65%
ease of use	75%
display	60%
value for money	60%



**HMS Home  
Accounts  
BBC B with  
disc £28.75**

Harris McCutcheon Systems, 40 Huntingdon St, London N1

Available only for disc-based BBC B micros, the disc supplied

may be 40- or 80-track and comes with a user manual. The press release accompanying the well packaged produce says it's the best home accounting system for the BBC B. Well, how did it live up to this ambitious claim?

First let's us look at the user manual. Its style is, to say the least, difficult to follow. It may be straightforward to a qualified accountant, but not to a mere

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computer user. It runs through more jargon than any computer manual, with six box cycles, four box cycles, debtor account codes, clear-downs etc...

It would be better to rewrite it — or arrange a short training course. On running the program I found the system difficult to follow and overly complex for a simple task.

The package may be the answer for the small businessman, though he would need to be

a blend of accountant and computer enthusiast. The package is also over priced. I realise professional software costs much more, but this is the home market after all.

instructions	35%
ease of use	30%
display	N/A
value for money	30%



**Micro-Prolog  
48K Spectrum  
£24.95**

Sinclair, 25 Willis Rd, Cambridge CB1 2AQ

Micro-Prolog is a logic programming language which, instead of telling the computer what to do, allows you to ask the computer questions of relationship. The package consists of a cassette, an explanatory booklet and a 300-page paperback, Micro-Primer, with many exercises and examples, so, clearly, trying to explain how it works here is impossible.

It is suitable for expert system programs built round large databases of facts and relations, so that if a question is asked about these facts, an intelligent answer will be given. It has been

used for accounting packages, medical diagnosis, car mechanical diagnosis and particularly in the artificial intelligence field.

An historian, for instance, might program all the kings and queens since the year dot and be able to ask: "Who was Henry VIII's mother-in-law?". It is not necessary to program all relationships; saying "roof is above house" permits you to query "What is below roof?"

An excellent implementation for the Spectrum and with excellent manuals. D.C.

instructions	90%
ease of use	80%
display	N/A
value for money	75%



**Dynamic  
Graphics  
48K Spectrum  
£14.95**

Procom, 309, High Rd, Loughton, Essex

The one we've all been waiting for: sprites made easy. Not only easy but a pleasure! The excellent large-size manual is almost superfluous since the programs are explicitly menu-ed and very forgiving of error.

Tape 1 Side 1: a sprite designer, up to 4 by 4 character squares. The four menus allow horizontal and vertical flip, rotation, swapping, copying, pixelshift, on character squares and whole sprites, with up to six in a sequence of 16 frames in any colour you like or on a pre-designed screen. Sprites can be saved, verified and reloaded. Finished sprites load into Tape

1 Side 2, where up to 10 can be compiled into relocatable machine code, called and moved from BASIC. Compiled sprites may be used commercially.

Tape 2: an excellent Eich-a-Sketch-type screen designer with window and rescaling, was previously published, and still sold by, Campbell Systems as Drawmaster.

Not revealing this mars a superb package and reputations of two good software houses. Inevitably, utility collectors will buy both and feel cheated. Advertising and packaging should be amended. This apart, highly recommended. D.C.

instructions	95%
ease of use	95%
display	95%
value for money	85%



**Scope  
48K Spectrum  
£11.95**

ISP, Crown House, 38B High St, Godalming, Surrey

Writing graphic programs? Can't get the hang of machine code? Frustrated by BASIC slowness? Take Scope! It adds 31 commands to BASIC. Many duplicate available BASIC

commands, but in a shorter, more powerful way, enabling you to write programs, including sub-routines, which are then compiled into machine code, called from a BASIC program.

The manual is extremely easy to follow. Commands are written into REM statements and cover putting graphics to screen, movement, testing positions with automatic jump to your sub-routines, better (although not musical) sound, scrolling by

pixel, plot and draw, changing overall or specific colours, showing scores and high scores, and clearing all or part of display.

Compiled programs run much faster although, with only UDGs programable, some flicker is inevitable. After compiling, the next address available for Scope is shown, making it easy to calculate how many bytes have been used and all the programs are relocatable. Unfortunately,

they won't run unless Scope is in memory. ISP considers publication of programs using Scope or licences for their use.

Even nicer if sprites were included but, nevertheless, very useful. D.C.

instructions	95%
ease of use	90%
display	N/A
value for money	85%



## Tarot Card Atari £12.95

English Software, Box 43, Manchester M60 3AD

Yes, now you can closet yourself in with your computer, turn down the lights and find out how your life came to be all screwed up. And how to unscrew it, even.

Don't ask my why, it begins with a pleasant starlit scene of a modern coastal city viewed from offshore. Soon the moon rises and the soft susurrant of waves breaking is heard. This is your signal to press START.

The computer then asks you to enter a question, maximum 21 characters, about anything. It will digest your input and show you three cards, one of which you will be asked to pick — this should be the one most applicable to your situation.

The screen will clear and display eight cards each of which has a special meaning regarding life's perilous voyage. Based on your previous question and card chosen, you will see your prospects covering each card shown.

Unfortunately, the necessary limited database can make it no more than a novelty. The 16K version omits some cards.

This game, with nice graphics, could be of interest for those who find the occult fascinating. Other lusters after the unknown may wish to continue on their way.

instructions	75%
playability	70%
graphics	90%
value for money	60%



## Avenger Dragon 32 £5.99

Voyager, Business Centre, Cloughton Rd, Birkenhead L41 6ES

A fast moving arcade game covering three different screens. Aliens have invaded earth and

an endless stream of their fighters plunder the earth. You belong to a small band of freedom fighters. On screen one you must avoid the spacemen to get to the recharging stations to gain ammunition. On screen two you can use this to shoot your enemies. On screen three you must negotiate barriers to reach the top where you are rewarded with extra lives and

## Centipoid plus three 48K Spectrum £6

Orwin, 26 Brownlow Rd, London NW10 9QL

Centipoid is just another name for centipede, at least the graphics suggested a centipede. yet another variation of space invaders, this time disguised as scorpions, spiders and of course a centipede.

One useful feature is the ability to re-define the control keys, which should be in every game. some of the ink/paper combinations make at times for difficult reading.

Although action is smooth, and keyboard response very positive, the game doesn't make for compulsive playing. It's

irksome to be continually asked to press a key in order to progress to the next stage.

Side 2 contains three games written in BASIC, which is very evident. First is a graphic mini-adventure in which your task is to open a safe. The game is called Hound, because a hound pursues you. The second game, Panic, is one of those wall and ladder games. The final game is a three dimensional Tic-Tac-Toe, you against a very slow computer — on average about one minute per move. In today's highly competitive software market these games represent a very amateurish offering.

instructions	100%
playability	50%
graphics	50%
value for money	40%



## Armada TI-99/4A £7

It makes a change to set the clock back, here to the 16th century as the British once more do battle with the Spanish Armada.

The screen displays a view from your ship's deck, its cannon and outlook to sea. An enemy vessel appears and travels across the waves. After selecting its angle and powder load your

cannon is fired. Sinking the enemy produces another ship until all 10 of the British or Spanish fleet are annihilated. If you miss the ship returns fire.

This sounds complicated but before long you are so familiar with the angles and loads that the game becomes boring.

The game is supposed to be for one or two players. In the one-player situation you play the computer, which has a 50 per

cent chance of making a hit. When two people play they take turns.

Apart from the instructions, however, there is no difference between the one- and two-player game — the display is the same and the computer participates as before. There is little point in two people competing, since it may be the computer that decides the winner, not necessarily skill. Needs Extended BASIC. J.W.

instructions	50%
playability	30%
graphics	45%
value for money	40%



# For the fun of it

## Latest games for Atari, Dragon, Spectrum and Texas play-tested by our team

ammunition. The sequence repeats until all lives are lost and each time the screens get more difficult. Each has a time limit — on screen two this increases by 50 every time you lose.

At the start of each game you can set and test the sensitivity of the joystick.

There are nine levels of difficulty which determine the number of lives you begin with. High score tables for each are maintained and these can be

saved.

A BASIC program needs to be loaded and this automatically loads the main machine code program. Loading caused no problems.

J.E.M.

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



## Jungle Adventure Spectrum 48K £6

Cases Computer Simulations, 14 Langton Way, London SE3 7TL

Another "Game for girls" — help Bobo, an African girl, get home from school through the jungle.

The game has two parts with five difficulty levels. Part one is an animated Mastermind: guess which objects (books, eggs, coconuts and hamburgers) are in the four blue jars by pressing the up cursor when your choice arrives on a conveyor belt underneath. A blackboard shows "•••" for right object, right place and "+••" for right object, wrong place, on each guess. My display only showed three clues although another Spectrum gave four —

but perhaps I wasn't guessing right. Bobo takes correctly guessed objects and part two is an invisible maze. Bobo is bottom left and home is top right and the hidden animals between them are displayed for an instant. Off goes Bobo via cursor keys.

Hitting a hidden animal, she must give the appropriate object, if she has it, by pressing the initial letter. Failure, or slowness, loses although there's five lives. Get extra objects at hidden shops, if you're quick.

Nice graphics but impossible time for memorising, when necessary, to note positions of animals you have objects for, to increase your score.

D.C.

instructions	90%
playability	75%
graphics	85%
value for money	65%





# Cracking this code needs some careful thinking

### How it works

- 0-5 initialise
- 91-94 set up sound chip
- 100-102 randomly pick code
- 105-140 get guessed code
- 160-230 process what counters should be displayed
- 300-320 display counters
- 340-360 return to guessed code
- 410 remove sprite
- 500-540 completed code routine
- 600 fail to complete code routine
- 700-730 another go?
- 900-2000 set up screen

Logic Master is frustrating... but fun. Type in Michael Diskett's program for the Commodore 64 and get those brain cells working

### Variables

- V start of Video Interface Chip
- S start of sound chip
- BL,WH numbers of counters in bottom, top boxes
- AS0,CS0 one digit of player's guess, correct code
- T loop to get four digits of code
- KL loop to clear sound chip
- P position for code to be POKEd on screen
- A position of screen memory for the key pressed

Your challenge in Logic Master is to crack the code selected at random by your computer.

The code will be made up of four digits, each a number from zero to nine, and can only be cracked with careful thinking and logic.

Each time you enter what you think the code is the two boxes on the screen will turn into a number of counters.

Each counter in the bottom box tells you that one of the digits in your guess is in the correct place and is the correct number.

For example, if the bottom box turns into four counters then you know all four digits are in the correct places and are the correct numbers.

Each counter in the top box means that one of the digits in your guess is the correct number but is in the wrong position.

So if the top box turns into four counters then you know



that all the digits in your guess are correct but in the wrong places.

While playing the game you can only use the numbers 0 to 9, or the delete key to edit any mistakes you have made.

- As usual, we have inserted REM lines above the control characters in the listing to help you while you are typing in the program. These REMs should not be entered.

### Hints on conversion

Most of the program should transfer easily apart from the need to change the screen display and the sound. These are the POKEs I used:

- 1024 screen memory
- 52296-56295 colour memory
- 54296 volume setting
- 54273 high frequency of note
- 54272 low frequency of note
- 54276 waveform
- 54277 attack/decay

```

0 V=53248:POKEV+21,3:POKEV+23,1:POKEV,40
10 PRINT"?"
20 POKES208,0
30 POKES3281,1
35 OOSUB908
40 R=1377
50 GOTO1080
91 S=54272:FORKL=STOS+24:POKEKL,0:NEXT
92 POKES+5,27:POKE+6,0:POKE+24,15
93 POKES+4,129:POKE+1,30:TW2:POKE,141+TW2
94 GOTO1010
100 FORT=1T04:CR(T)=STR$(INT(RND(1)*7)):CR(T)=RIGHT$(CR(T),1):NEXT
102 P=0:FOR=1T04:POKEP,ASC(CR(T)):P=P+60:NEXT J
105 FORLOOP=1 TO10:BL=4:WH=4:FORT=1T04
110 GET R$(T):IFR$(T)=""THEN10
120 IF V$(R$(T))=SORVAL(R$(T)):LND$(T)=0:0*THENIFRSC(R$(T)):O20THEN01
125 IF ASC(R$(T))=20AND(C1)THENR=60:T=1:POKE,61:GOTO110
130 POKER,ASC(R$(T)):R=H8
131 S=54272:FORL=STOS+24:POKEKL,0:NEXT
132 POKES+5,27:POKE+6,0:POKE+24,15
133 POKES+4,17:POKE+1,30:TW2:POKE,141+TW2
140 NEXTT
150 R=H8
160 FORT=1T04:TP$(T)=CR(T):NEXT
170 FORC=1T04:IF CR(C)=R$(C)THENR$(C)="":CR(C)="":GOTO1080
180 BL=BL-1
190 NEXTC
200 FORC=1T04:FOR=1T04
210 IF CR(C)=R$(C)THENR$(C)="":GOTO230
220 NEXTC:BN=H-1
230 NEXTO
300 IFH=0:0THENPOKER,47-H:POKER+54272,5
310 R=H+40
320 IFBL=0:0THENPOKER,47-BL:POKER+54272,2
330 R=H-3:R=H+40
340 FORT=1T04:CR(T)=TP$(T):NEXT
350 IF BL=4THEN500
360 NEXT LOOP
400 R=H
410 FORT=48T08STEP-1:POKEV,T:POKEV+2,T:NEXT
420 GOTO600
    
```

```

440 RENHORE[12:CRSR:DOWN][BLK]
500 PRINT"*****YOU HAVE COMPLETED THE CODE IN "LO
503 FORT=40T08STEP-1:POKEV,T:POKEV+2,T:NEXT
510 PRINT"GUESSES:"
520 IF LO<THEPRINT"THIS IS EXTREMELY GOOD"
530 IF LO=THEPRINT"THIS IS NOT TOO BAD"
540 GOTO700
550 RENHORE[BLK][2:CRSR:DOWN]
600 PRINT"*****YOU FAILED TO COMPLETE THE CODE"
700 PRINT"DO YOU WANT ANOTHER GO (Y/N)?"
710 GETR:IFR=C:"Y":RND(R):0*THEN710
720 PRINTR:IF R=V*THENFORT=110T01247:POKE,32:NEXTT:OOSUB1000:R=1377:GOTO10
0
730 IFR="H"THENPRINT"?:POKE53208,14:POKE53201,6:POKEV+21,0:POKE646,14:CLR:END
900 POKES6334,PEEK(56334)+RND254:POKE1,PEEK(1)+RND251
910 FORI=0T0711:POKEI+12280,PEEK(I+53248):NEXT
920 POKEI,PEEK(I)+RND56334,PEEK(56334)+ORI
930 FORCH=4T046:FORBV=0T07:REDMI:POKEI2280+(3*CH)+BV,H:NEXTV,CH
940 DATR205,129,129,129,129,129,129,255
950 DATR,231,231,0,0,231,231,0
960 DATR,231,231,0,0,224,224,0
970 DATR,231,231,0,0,0,0,0
980 DATR,224,224,0,0,0,0,0
990 POKES272,29
995 FORT=44820T064#232:POKET,255:NEXTT
999 REN[HOME][HOME][CRSR:DOWN]
1000 PRINT"R:TAB(14):"LOGIC MASTER:"*":RND(TAB(14)):
1004 RENHORE[17:CRSR:DOWN]
1005 PRINT"*****"
1010 PRINT"MI":FORT=1T033:PRINT"-":NEXT:PRINT"-":
1015 REN[CRSR:RIGHT]
1020 FORT=1T010:PRINT"MI":TAB(35):"-":NEXT
1025 REN[CRSR:RIGHT]
1030 PRINT"MI":FORT=1T033:PRINT"-":NEXT:PRINT"-":
1040 R=1377
1050 FORJ=1T010:FORT=1T04:POKE,61:R=H+80:NEXT R=H-3:R=H+40:NEXTJ
1060 R=1597
1070 FORJ=1T010:POKER,42:POKER+54272,5:R=H+40:POKER,42:R=H-3:R=H+40:NEXTJ
1080 POKEV,40:POKEV+1,114
1090 POKEV+2,40:POKEV+3,150
1100 POKEV+29,0:POKEV+40,0:POKE2040,220:POKE2041,231
2000 RETURN
    
```

# Race, space and spinning the plates...

New and not-so-new ideas in arcade games. Our reviewers play-tested them

## Bumping Buggies CBM 64 £6.99

Bubble Bus, 87 High St, Tonbridge, Kent TN9 1RX

A race-and-chase game with a difference. Normally you race down a rapidly unfolding track avoiding cars and hazards. Here you can bump and be bumped by other cars, forcing a crash off the

sides of the track. Another gimmick, in deference to the Fall Guy and Dukes of Hazzard, is that you can jump over cars and obstacles, providing you are doing over 100 mph.

It sounds good and the initial screen display and introductory tune build up the excitement. In practice, however, I was a bit disappointed. Idea and the implementation aren't bad, but somehow I wasn't hooked. I think it was just a little too difficult for

## Moonbuggy 48K Spectrum £6.95

Visions, 1 Felgate Mews, Studland St, London W6 9JT

Unfortunately, the instructions just state LOAD\*\*\*\*, and should read LOAD\*\*\*\*CODE. A small point, maybe, but one that can throw a newcomer to the Spectrum into a panic.

The game is of the space invader type, but the base is a four-wheeled buggy. Apart from flying baddies there are all kinds of things in the horizontal plane as well. These are rather graceful and appear to be performing a ballet. They still drop bombs, of course. The landscape is pitted with potholes. If you fall into one, or are hit by a missile, then a wheel drops off to signify a life

lost. You can jump over the potholes, if you are not too busy.

The graphics, though strange looking, move smoothly, and there is very positive keyboard response. I am very impressed by the programming standard.

Small gripes: along with other programmers, this one has at times made a poor choice of paper/ink. And, as I say here often, the option to choose your own control keys should be included. A good quality game for those not tired of space invaders. **B.B.**

instructions	75%
playability	100%
graphics	80%
value for money	75%



## Chinese Juggler CBM 64 £6.90

Ocean, Ralli Buildings, Stanley St, Manchester M3 5FD

A fiendishly cunning idea — to replicate a Chinese juggling act. The scene is the stage in a theatre. The curtain rises and, to frantic music, a juggler spins plates on sticks. Then it's your turn.

You control the juggler with the joystick. At the start there are eight sticks. You have to move the juggler to the front to pick up plates, position them and set them spinning. Every so often you need to rush back to previous sticks to keep the plates spinning. If you manage to get

eight plates up and spinning you go up a level.

There are 10 levels. At the first it doesn't matter what colour plates you use but at the next you have to use the specified colour and so on.

It seems an ideal gift for someone who wants to run away to the circus. It's also a challenge to armchair critics who've seen this on TV and reckon they could do better. Difficult at higher levels, it is also very satisfying when you get all plates up and spinning. Needs joystick. **L.C.**

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



## Nomad TI-994A £10

DEJ, from Stainless, 10 Alstone Rd, Stockport, Cheshire

The year is 2365. Seated in the cockpit of your junk collector a warning on the instrument panel informs you its time for action — a nomad fighter has just been detected.

Using joystick controls you steer to the nomad's heading. At this point your adversary appears on the screen, but your sights must be quickly set to shoot before it attacks and accelerates to a different heading.

Your purpose is not to seek and destroy, however, as this will not be rewarded by points. You are there to salvage satellites. When these have been located they are collected by the

magnetic prongs seen from your cockpit. Rapid alignment is required as once the satellite is out of visual range it will have to be re-located on a different heading.

If you like this sort of simulation you will perhaps enjoy varying the frequency of attacks, laser power and aggressiveness of nomad attackers. Although described as for more advanced players, I found it did not sustain my interest for long. Needs joystick, Extended BASIC. **J.W.**

instructions	60%
playability	50%
graphics	40%
value for money	40%



## Asteroid Miner 32K BBC £6.95

Optima, 36 St Petersgate, Stockport SK1 1HL

Another space game but, unlike most others, it has none of the fast shoot-'em-up appeal. This is more a game of strategy.

The most disappointing thing is the poorly defined single colour graphic shapes which also

tend to flicker a great deal, suggesting the game is somewhat late onto the market. They are fairly representational but lack the finesse one now expects.

The strategy element is the scooping up of precious metals from the asteroid storm, keeping your opponent from having them, while at the same time avoiding his neutron mines and the other floating debris. Control is fairly good and responsive

and, as is usual in space games, it is the difficulty of manoeuvring that provides the drama.

The asteroids are simply dots — this too suggests this game has missed its time.

There is an element of skill in the movement and avoidance of mines left by the opposition but overall this can only be considered a rather dull and unimaginative offering with very little to recommend it. **D.C.**

instructions	35%
playability	45%
graphics	25%
value for money	25%



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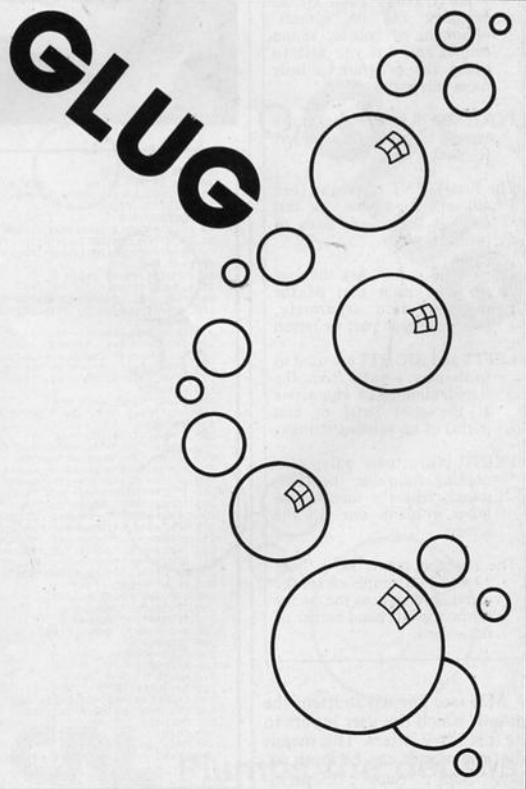
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## VIC-20 PROGRAM

This is a useful little program which accepts any date between 1800 and 2099 and calculates the day of the week on which that date fell. The program is based on a formula learned from an elderly relative.

The span of years acceptable as the input can be increased by adding lines similar to those at 250 and 260, and altering line 90 accordingly. For example, any date between 1700 and 1799 would require an instruction to add 4 to the value of the variable A.

However, a word of warning: beware of the fact that, due to the re-organisation of the calendar, the day following 2nd September 1752 became 14th September. The dates 3rd-13th September 1752 never existed.

The program is fully robust. Unacceptable input is rejected but, to a large extent, spelling mistakes and the shortening of the names of months is ignored.

Months must be input by name (eg, "June" or "Jun" is acceptable, but "6" will be rejected).

### Hints on conversion

This program should convert fairly easily, as the final display, as listed here, is merely a black screen with white lettering. There are no graphics and no sounds, although, of course, sound can be added if you wish to make the program a little more interesting.

POKE 36879,8 sets the entire screen, including the border, to black.

The first PRINT command (line 40) sets the colour, for this and all subsequent lines of print, to white.

Lines 40-60 and 80 ask the user to input each part of the relevant date separately, following each part by return

LEFTS and RIGHT\$ are used to form new strings from the stated number of characters at the start (left) or end (right) of an existing string.

PRINT instructions only, with nothing following the command, tells the machine to leave a blank line on the screen.

The reversed heart, as in lines 30 and 340, simply clears the screen and returns the cursor to the top left hand corner of the screen.

M2\$ (see line 85) shortens the month which the user inputs to its first three letters. This means that the month can be input as, say, "Sep", "Sept", "Septem-

# Choose a date, find the day

**Trick question: What day was September 3, 1752? Answer: It never existed. Type in Day Finder, written for the unexpanded VIC-20 by A.R. Jenks, to calculate days of dates**



```

10 REM DAY FINDER
20 REM BY A.R. JENKS NOV 83
25 DEF FURTLEDAY= SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY
30 PRINT "D" PRINT
35 POKE36879,8
40 PRINT "ENTER DAY, MONTH, YEAR" PRINT
50 PRINT "FOLLOWING EACH WITH" PRINT
60 PRINT "RETURN OR COMMA" PRINT
70 LV=0: A=0
80 INPUT D, M, Y: VE PRINT
85 M2=LEFT$(M,3)
90 IF VAL(VE)<1800OR VAL(VE)>2099 THEN PRINT "YEAR NOT ACCEPTABLE" PRINT: GOT040
100 Y2=RIGHT$(VE,2): Y3=LEFT$(VE,2)
120 R=VAL(Y2)
130 IF INT(VAL(VE)/4)=VAL(VE)/4 THEN LV=1
135 IF INT(VAL(VE)/100)=VAL(VE)/100 THEN LV=0
140 IF (VAL(D)>30OR VAL(Y)>0) OR (VAL(D)>29AND LV=1) AND M2="FEB" THEN LV=0
145 IF VAL(D)>30AND M2="SEP" OR M2="JUN" OR M2="APR" OR M2="NOV" THEN LV=0
150 IF VAL(D)>31OR VAL(D)<1 THEN LV=0
155 GOT0180
160 PRINT "SINCE WHEN HAS"
165 PRINT M2, "HAD " D, " DAYS" PRINT
170 GOT040
180 A=M+INT((M-25)/4)*VAL(D)
190 IF M2="JAN" AND LV=0 THEN A=A+1: GOT0250
195 IF M2="FEB" AND LV=0 THEN A=A+4: GOT0250
198 IF M2="FEB" AND LV=1 THEN A=A+2: GOT0250
200 IF M2="MAR" OR M2="NOV" THEN A=A+4: GOT0250
203 IF M2="APR" OR M2="JUL" THEN A=A+2
205 IF M2="MAY" THEN A=A+2: GOT0250
208 IF M2="JUN" THEN A=A+3: GOT0250
210 IF M2="AUG" THEN A=A+3: GOT0250
213 IF M2="SEP" OR M2="DEC" THEN A=A+6: GOT0250
215 IF M2="OCT" THEN A=A+1: GOT0250
220 PRINT "PLEASE RE-ENTER MONTH"
230 PRINT "ONLY" PRINT
240 INPUT M: PRINT: GOT085
250 IF V3="13" THEN A=A+2
260 IF V3="20" THEN A=A+2
270 B=INT(A/7): A=A-INT(B*7)
280 D=INT(A/7)
290 FOR D=0 TO 6
300 PERD$(D)
310 NEXT D
320 B$="MILL DE"
330 IF VAL(VE)>1903 THEN B$="MAG"
340 PRINT "D" PRINT: PRINT: PRINT
350 PRINT D$, " " M2$, " " Y3$, " " Y2$, " " B$
360 PRINT
370 PRINT "A " B$(A)
380 PRINT: PRINT: PRINT: PRINT: PRINT: PRINT
    
```

### Main Variables

**A** holds the running total of the all-important calculation which gives a final answer between 1 and 7, which corresponds to the day of the week.

**LY** will equal 1 if the input year is a leap year and 0 if it is not. A leap year occurs every fourth year, except at the start of the century (calculated in lines 130 and 135).

**B** is used briefly, in line 270, where any unwanted remainder from the final answer of 1 to 7 is discarded.

**BS** gives a past or future tense to the final answer, putting anything before 1st January 1984 in the past tense.

**AS** is the day of the week

**DS, MS and YS** hold the day, month, and year, as input by the user

ber", or even something like "Sepooooo8m",

As long as the first three letters are input correctly, the day of the week will still be calculated.

Input is in the form of a string, rather than a number variable, in all cases. The VAL command is then used repeatedly to convert the input to a numerical value.

This allows the splitting of the year into two parts (e.g. 1972 can be split into 19 and 72) for different parts of the calculation. The two parts of the year are held in Y2\$ and Y3\$.

The use of strings rather than number variables also permits a much more tolerant input — for example, the day of the month can be input as, say, "22" or "22nd", or even something silly, such as "22xyz". Anything totally unacceptable will, of course, be rejected.



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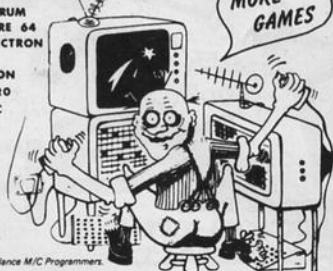
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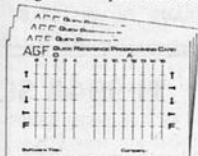
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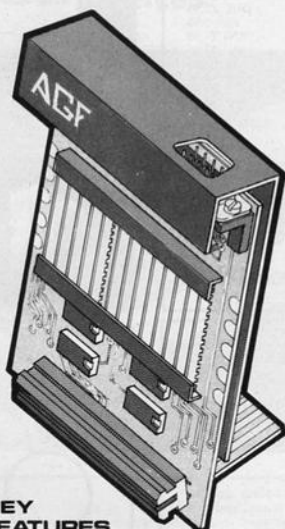
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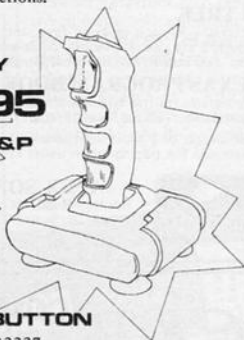
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### Top Ten programs for the Dragon 32

- |    |                            |                |
|----|----------------------------|----------------|
| 1  | The King                   | Microdeal (9)  |
| 2  | Ugh!                       | Softek (2)     |
| 3  | Eight Ball                 | Microdeal (8)  |
| 4  | Cuthbert in the<br>Jungle  | Microdeal (-)  |
| 5  | Devil Assault              | Microdeal (7)  |
| 6  | Hungry Horace              | M. House (1)   |
| 7  | Frogger                    | Microdeal (-)  |
| 8  | Space Shuttle<br>Simulator | Microdeal (5)  |
| 9  | SAS                        | Peaksoft (3)   |
| 10 | Grand Prix                 | Salamander (-) |

### Top Ten programs for the VIC-20

- |    |                            |                 |
|----|----------------------------|-----------------|
| 1  | Wizard and the<br>Princess | M. House (2)    |
| 2  | Crazy Kong                 | Interceptor (3) |
| 3  | Bewitched                  | Imagine (4)     |
| 4  | Wacky Waiters              | Imagine (9)     |
| 5  | Paratrooper                | Rabbit (5)      |
| 6  | Jetpac                     | Ultimate (10)   |
| 7  | Ski                        | CBS (-)         |
| 8  | Gridrunner                 | Llamasoft (6)   |
| 9  | Supervaders/<br>Bomber Run | K-tel (-)       |
| 10 | Skyhawk                    | Quicksilver (-) |

### Top Ten programs for the ZX81

- |    |                   |                 |
|----|-------------------|-----------------|
| 1  | Flight Simulation | Sinclair (1)    |
| 2  | Football Manager  | Addictive (3)   |
| 3  | Chess 1K          | Sinclair (2)    |
| 4  | Crazy Kong        | PSS (8)         |
| 5  | Hopper            | PSS (9)         |
| 6  | Invaders          | Quicksilver (4) |
| 7  | Meteors Storm     | DK'tronics (-)  |
| 8  | ZX Forth          | Sinclair (-)    |
| 9  | ZX D.B.           | Bug-Byte (10)   |
| 10 | Chess 2           | Artic (-)       |

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

### Top Ten programs for the Spectrum

- |    |                   |                  |
|----|-------------------|------------------|
| 1  | Chequered Flag    | Psion (1)        |
| 2  | Atic Atac         | Ultimate (2)     |
| 3  | Flight Simulation | Psion (-)        |
| 4  | Lunar Jetman      | Ultimate (6)     |
| 5  | Ant Attack        | Quicksilver (3)  |
| 6  | Alchemist         | Imagine (7)      |
| 7  | Hunchback         | Ocean (5)        |
| 8  | The Hobbit        | M. House (9)     |
| 9  | Cyrus-IS-Chess    | Intelligence (8) |
| 10 | Scuba Dive        | Durrell (4)      |

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

## BEST SELLERS

# Top 30

- |    |                           |                      |               |
|----|---------------------------|----------------------|---------------|
| 1  | Manic Miner               | Software<br>Projects | Spectrum (1)  |
| 2  | Hunchback                 | Ocean                | Spectrum (2)  |
| 3  | 3D Ant Attack             | Quicksilver          | Spectrum (3)  |
| 4  | Atic Atac                 | Ultimate             | Spectrum (6)  |
| 5  | Hunchback                 | Ocean                | CBM 64 (10)   |
| 6  | The Hobbit                | M. House             | Spectrum (5)  |
| 7  | Bear Bowver               | Artic                | Spectrum (22) |
| 8  | Lunar Jetman              | Ultimate             | Spectrum (7)  |
| 9  | Chinese Juggler           | Ocean                | CBM 64 (27)   |
| 10 | Chuckie Egg               | A & F                | Spectrum (11) |
| 11 | Buga Boo<br>(The Flea)    | Quicksilver          | Spectrum (23) |
| 12 | Eskimo Eddie              | Ocean                | Spectrum (25) |
| 13 | Frogger                   | Microdeal            | Dragon (15)   |
| 14 | Snooker                   | Visions              | VIC-20 (28)   |
| 15 | The King                  | Microdeal            | Dragon (14)   |
| 16 | Falcon Patrol             | Virgin               | CBM 64 (12)   |
| 17 | Hobbit                    | M. House             | CBM 64 (13)   |
| 18 | Jet Set Willie            | Software<br>Projects | Spectrum (-)  |
| 19 | Chequered Flag            | Psion                | Spectrum (19) |
| 20 | Cuthbert in the<br>Jungle | Microdeal            | Dragon (21)   |
| 21 | Hunchback                 | Superior             | BBC (20)      |
| 22 | Pedro                     | Imagine              | Dragon (29)   |
| 23 | Zzoom                     | Imagine              | Spectrum (17) |
| 24 | Harrier Attack            | Durrell              | Spectrum (9)  |
| 25 | Penetrator                | M. House             | Spectrum (19) |
| 26 | Colossus Chess            | CDS                  | CBM 64 (30)   |
| 27 | Crazy Kong                | Interceptor          | CBM 64 (24)   |
| 28 | Quasar                    | Voyager              | CBM 64 (-)    |
| 29 | Arcadia                   | Imagine              | VIC-20 (22)   |
| 30 | Crashman                  | New<br>Generation    | Spectrum (-)  |

Compiled by PCS Distribution (0254 691211) from a sample of 40 dealers in the U.K. and Northern Ireland. Chart is for sales in the fortnight ended March 9.

### Top Ten programs for the Commodore 64

- |    |                             |                          |                 |
|----|-----------------------------|--------------------------|-----------------|
| 1  | Manic Miner                 | Software<br>Projects (2) | Interceptor (-) |
| 2  | Siren City                  | Ocean (4)                | Virgin (8)      |
| 3  | Mr Wimpy                    | Virgin (8)               | Ocean (3)       |
| 4  | Falcon Patrol               | Quicksilver (2)          | Paramount (5)   |
| 5  | Chinese Juggler             | Interceptor (-)          | Centresoft (-)  |
| 6  | Buga Boo<br>(The Flea)      | Llamasoft (-)            |                 |
| 7  | Megawar                     |                          |                 |
| 8  | Vortex Raiders              |                          |                 |
| 9  | Forbidden Forest            |                          |                 |
| 10 | Revenge of Mutant<br>Camels |                          |                 |

## DRAGON 32 PROGRAM

The Dragon has a good-sized memory, but how do your recall facilities measure up? Find out by typing in The Memory Game.

The program works by setting you a series of fun problems to solve in two minutes.

Each problem consists of:

- 1 A number of object names appear at random positions on the screen
- 2 You study the words for 10 to 30 seconds — the time varies according to difficulty level — in an attempt to store them away in your mind
- 3 The screen darkens, followed by the re-printing of the object names minus one
- 4 After you have studied the remaining names the screen will clear and leave you with the problem of typing in the name of the missing object
- 5 You are informed whether you have answered correctly or incorrectly and the process repeats itself as many times as possible within two minutes. This means that you should waste no time with your response to the missing object question.

Full instructions are also in the program.

There is a scoring system and a high-score table. This high-score routine is clearly indicated in the listing so you can use it in your own games.

### How it works

50-70 store a sound effect, set RND to nearly true random, dimension arrays

80-120 title page

130-220 instructions

230-310 difficulty level, number of objects

320-330 initialise some variables and timer

340-390 reads data into arrays in random order

400-600 memory game process

610-630 time up and score given

640-740 high-score Table routine

770 another game?

# How's your memory? This will put it to the test

**Quick recall is needed to play Tim Copsey's game for the Dragon 32. Type it in and test the family, changing the words when they get too familiar**



### Main variables

VS sound effect  
WS,W2S,S0,MS arrays for data and high-score details  
SC score  
O2 number of objects  
H,C counters  
T2 display times  
QS answer to missing object question, later used for "another game" question

The program uses about 3½K of RAM.

The EXEC 41194 command is used to pause execution at certain points until any key has been pressed (including BREAK).

The data can be changed if you find you are becoming too familiar with the words — replace the last 12 of the 13 items with words of six or less characters. The first item, Dummy Object, is there to make the program function correctly.

The flashing effect used on certain messages is achieved by using PRINT@.

First the message is printed normally and then it is reprinted in the same place in inverse video. This process is repeated a number of times in a FOR... NEXT loop.

When I was developing the sound effects for the title page I discovered a good laser/zap sound which can be found in VS.

### Hints on conversion

To get a version of the program running on your own computer, use the idea behind the program and the features of your micro to implement it. Dragon Microsoft BASIC is fairly standard so few problems should be encountered.

```

10 REM*****
20 REM* BY TIM COPSEY *
30 REM FOR HOME COMPUTING WEEKLY
40 REM*****
50 V$="V31T255L2005FGBFT4P1"
60 XR=RND(-TIMER)
70 DIMW$(12),W2$(12),S0(11),M$(11),L(11)
80 CLS@:PRINT@73,"the";CHR$(128);"memory";CHR$(128);"ga
me";
90 PRINT@128,STRING$(32,137)::PLAY V$
100 PRINT@261,"home";CHR$(128);"computing";CHR$(128);"w
eekly";:PLAY V$
110 PRINT@363,"WRITTEN BY";:PLAY V$
120 FOR I=2 TO 11:PRINT@427,"TIM COPSEY";:PLAY"0"+STR$(I
NT(1/2))+ "T255L250DEF":PRINT@427,"tim";CHR$(128);"copse
y";:PLAY"TBPI":NEXT:PLAY"4P1"
130 CLS:PRINT@0,"the memory game"
140 PRINT"WELCOME TO A GAME WHICH IS FUN TO PLAY AND A
IDS YOUR ABILITY TO REMEMBER THINGS!"
150 PRINT:INPUT"WOULD YOU LIKE INSTRUCTIONS ";K$:IF LE
FT$(K$,1)="Y" THEN 160 ELSE 230
160 CLS:PRINT@10,"instructions"
170 PRINT"THE NAMES OF OBJECTS WILL BE DISPLAYED AT
RANDOM POSITIONS ON THE SCREEN FOR A PERIOD OF TIME DETER
MINED BY THE LEVEL OF DIFFICULTY SELECTED. THEN T

```

```

HE SCREEN WILL CLEAR AND ALL THE ";
180 PRINT"OBJECTS WILL BE DISPLAYED AGAIN EXCEPT 1, WHI
CH YOU MUST NAME. EACH CORRECT ANSWER INCREASES YOUR
SCORE. THE FINAL SCORE IS CALCULATED BY:--"
190 PRINT"NUMBER CORRECT X OBJECTS"
200 PRINT"YOU HAVE 2 MINS TO SCORE AS MANYPOINTS AS YOU
CAN."
210 PRINT"****press a key to continue****";
220 EXEC41194
230 SC=0:CLS:PRINT@6,"level of difficulty"
240 PRINT@64,"DIFFICULT"
250 PRINT 1 - 10 SECS DISPLAY TIME"
260 PRINT 2 - 15 SECS DISPLAY TIME"
270 PRINT 3 - 20 SECS DISPLAY TIME"
280 PRINT 4 - 30 SECS DISPLAY TIME"
290 PRINT"EASIEST":PRINT
300 INPUT"SELECT A LEVEL";L:IF L<1 OR L>4 THEN GOTO 230
310 INPUT"ENTER THE NUMBER OF OBJECTS REQUIRED I MIN
=7 MAX=123";O2:IF O2<7 OR O2>12 THEN GOTO310
320 TIMER=0
330 C=0:OB=O2-1
340 FOR I=0 TO O2:READ W$(I):NEXT
350 DATA DUMMY OBJECT,APPLE,PENCIL,CUP,BOOK,SPOON,BOWL,
ORANGE
360 NOTE DUMMY OBJECT WILL NOT APPEAR ON SCREEN
370 DATA PLATE,KNIFE,FORK,LAMP,RULER
380 N=RND(O2):IF INSTR(1,NA$,W$(N))<>0 THEN 380 ELSE NA
$=NA$+W$(N):W2$(C)=W$(N)
390 C=C+1:IF C=O2 THEN GOTO 400 ELSE GOTO 380
400 H=H+1:CLS

```



## DRAGON 32 PROGRAM

```

410 IF H<2 THEN PRINT"THE ORIGINAL "02"OBJECTS...." EL
SE PRINT"....AND NOW WITH ONE MISSING!":PRINT@400,"pres
s space if you know already";
420 FOR I=0 TO 08
430 X=RND(25):Y=RND(12):Y#=CHR$(Y+60)
440 IF INSTR(1,Z#,Y#)<>0 THEN 430 ELSE Z#=Z#+Y#:PRINT@X
+(Y*32),W2$(I);SOUND60,1:NEXT
450 IF L=1 THEN T2=1100
460 IF L=2 THEN T2=1800
470 IF L=3 THEN T2=2600
480 IF L=4 THEN T2=3900
490 FOR I=1 TO T2
500 IF H=2 AND INKEY#=" " THEN 510 ELSE NEXT
510 RESTORE:NA#="":Z#="":I=0
520 IF H=2 THEN 560
530 CLS:PLAY"11402CFFCCDEACCCDEAFGACF6DCCC":TIMER=TIME
R-150 TO GIVE USER FULL TIME - MUSICAL INTERLUDES
540 IF OB=02-2 THEN RETURN
550 OB=02-2:GOSUB400
560 CLS:PRINT@416,"";INPUT"which object has been remov
ed ";Q#
570 IF Q#=W2$(02-1) THEN FOR J=1 TO 3:PRINT@416,"THAT I
S THE CORRECT ANSWER":PLAY"12503FGACBDDFF04DFFF":PRIN
T@416,"that is the correct answer":PLAY"P1P1":NEXT:SC=S
C+1:TIMER=TIMER-150:GOTO590
580 IF Q#<>W2$(02-1) THEN PRINT@416,"WRONG! THE ANSWER
WAS ";W2$(02-1):SOUND100,2:SOUND25,10:TIMER=TIMER-49
590 H=0
600 IF TIMER<(50*120) THEN 330
610 PLAY"TAP1":CLS:FOR I=25 TO 200 STEP 25:PRINTAB(0)"
YOUR TIME IS UP!":SOUND I,3:NEXT
620 SC=SC*02:REM SCORE* OBJECTS
630 PRINT"IN TWO MINUTES YOU SCORED"SC
640 REM*****
650 REM*****HI SCORE ROUTINE***
660 IF SC>SO(10) THEN INPUT"ENTER NAME";M$(11):IFLEN(M$
(11))>15 THEN M$(11)=LEFT$(15,M$(11))
670 IF SC>SO(10) THEN SO(11)=SC:L(11)=L
680 FOR I=11 TO 1 STEP-1
690 IF L(I)<L(I-1) AND SO(I)>SO(I-1) THEN J=1
700 IF SO(I)>SO(I-1) OR J=1 THEN D=SO(I-1):LB=L(I-1):R#
=M$(I-1):SO(I-1)=SO(I):M$(I-1)=M$(I):L(I-1)=L(I):SO(I)=

```

```

D:M$(I)=R#:L(I)=LB
710 J=0:NEXT
720 CLS:PRINT@34,"NAME LEVEL SCORE";
730 FOR S=0 TO 9:PRINT@ (S+3)*32,S+1;M$(S):PRINT@ (S+3)*32
+18,L(S):PRINT@ (S+3)*32+26,SO(S):NEXT
740 PRINTSTRING$(32,175);
750 REM**END OF HI-SCORE TABLE**
760 REM*****
770 INPUT"DO YOU WANT ANOTHER GAME";Q#:IF LEFT$(Q#,1)="
Y". THEN 230

```



# MANCHESTER HOME COMPUTER SHOW

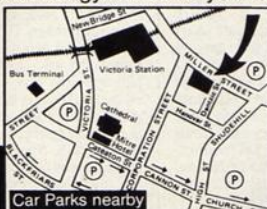
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## Defend your micro

I am 14 years old. Four years ago I started to get hooked on computers when I saw my maths teacher mucking about with a 380Z Research Machine. Then there was only one boy in the school with a micro and that was a ZX81.

As time lingered on I managed to get a TI-99/4A and was, and still am, very happy with it. But then suddenly another person got a micro and then another and another. Soon all the class was made up of Electron, Spectrum, TI-99/4A, VIC-20, Commodore 64, Dragon etc owners.

After that flood school wasn't the same any more. All the owners of the same micro ganged up and started insulting other gang's computers. There were savage remarks and blistering insults about some other gang's keyboard. It was worse than Dallas. It was unbearable. It was so terrible one Dragon owner broke down in tears after a merciless barrage!

Now we're launching a competition to see which micro has the best games. Don't worry you will get the results!

So, for any school pupil about to buy a computer, remember: be prepared to stand up for it!

**Andrew Davies**  
Birmingham

★ software winner

## Spectra Sound-off

If any of your readers are considering purchasing a DK'tronics Spectra-Sound unit, beware! If you own a Series 3 Spectrum, forget it.

After reading the fitting instructions, fitting seemed easy so I purchased it. When I tried to fit it these were the problems I found:

- Clips would not attach to points as indicated (soldering has to be done, which is only an option in the instructions)

- Tuning is very tricky
- It is impossible to close the case with the unit inside

I then discovered from DK'tronics that this unit is not compatible with the Series 3 (no reference to this in the fitting instructions).

I am now left with the problem of recovering my money, which shops do not like refunding.

My main question to

**Send your letter to Letters, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Don't forget to name your computer — the best letter could win £5-worth of software. Got a problem with your micro? We'll soon be starting a queries page, so send your technical questions to Queries at the above address**



DK'tronics is: Why was this problem not discovered earlier? Do they just make accessories without testing them.

I feel quite annoyed about this as I was willing to risk invalidating my guarantee for the prospect of better sound. I now find I am left with no better sound and no guarantee!  
**D.R. Witton, Stratford, London E15**

*Don Priestley, of DK'tronics, said: "Ninety per cent of the units work quite satisfactorily and some users have written to us to say how delighted they are."*

*Answering Mr Witton's points, he said that when Sinclair brought out the Series 3 Spectrum, DK'tronics tested its Spectra-Sound on one of the new models and it worked.*

*However, DK'tronics later discovered that this was only true of some Series 3 Spectrums. By then the units were on their way to customers.*

*He pointed out that the instructions, while saying the crocodile clips could be used, said: "The best way to do this is by soldering." A further problem was that changes inside the new Spectrum made fitting difficult.*

*He said that the Spectra-Sound would work with Series 1 and 2 Spectrums connected to 80 per cent of televisions. Tuning was difficult with the remaining 20 per cent.*

*Mr Witton's problem with closing the case was also because of the Spectrum's internal changes.*

*Mr Priestley promised that owners of faulty Spectra-Sounds, or users with Series 3 Spectrums or the 20 per cent of incompatible TVs would have the £9.95 purchase price, plus their postage, refunded if they sent their units back to: DK'tronics, Unit 6, Shire Hill Industrial Estate, Saffron Walden, Essex CB11 3AQ.*

*He said DK'tronics had now ceased production of*

*the Spectra-Sound and sales would end when the present stock was exhausted.*

*Mr Priestley said: "We could make another model but it would be more costly and we have had so many problems with this one that it's not worth pursuing."*

## What's my chance?

I read with dismay Bill Bailey's letter (My Oric Calendar, HCW February 20 - March 5) and thought what chance had I got with mine.

When I started to experiment with loops I found it would not do the following:

```
10 X = 0
20 IF X = 10 THEN 200
30 PRINT X
40 X = X + 0.1
50 GOTO 20
200 END
```

I would have expected the loop to count in increments of 0.1, 0.2, 0.3... 0.99999, 0.799999, not necessarily in that order, but along those lines. Also it did not recognise the condition statement at line 20.

When I changed line 20 and substituted the equals sign with a greater than sign it terminated the loop. As a matter of interest, I asked a friend to try it on his Oric and it did exactly the same. I wonder if other Oric users have experienced this?

I have been waiting for my Oric for nearly six weeks. I have pestered the shop from where it was purchased. They say it is Oric International who are holding things up. I have written to Oric but have not heard anything.

Is this a taste of after sales we are going to get from Oric? If so its new Atmos release will be very hard to sell.

**J.M. Hopkins**

## Over to you

I am very proud to say that I own a 48K Spectrum. I make sure that every week I have a copy of HCW. Congratulations on having the best reviews about, especially when HCW only costs 40p. I would be very grateful if any reader could tell me of any software companies who have produced a good version of the arcade game Time Pilot for the 48K Spectrum. My friend owns a Commodore 64 and has Space Pilot which is excellent.

**Thomas McMurray**  
Hamilton, Scotland

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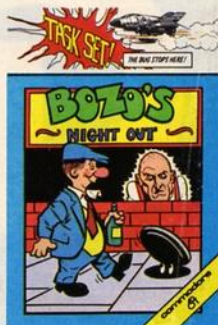
## GYROPOD

The complete deep space saga. A radical joystick action can bring inspired flexibility and a horrific kill-rate. The outstanding graphics include highly detailed craft and lots more than eight sprites at once. A full music and effects sound track accompanies the action. All these features combine with player options and a top 20 hi-score table to set new standards in hi-tech slaughter.



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A brand new character game. Poor old Bozo, all he has to do is to get home after a night out with the lads. That's easy until a wobble becomes a lurch and a stagger. Later into the night, all rules go out of the window as he disbelieves what's happening in front of his blood-shot eyes. An epic journey with ultra-smooth graphics and sprites which run rings round normal games.



## SUPER PIPELINE

Keep the pipeline open. Foreman Fred and Plumber Pete have their work cut out. The evil ladderman drops metal wedges to plug the pipeline - and only Pete can fix 'em. Pete trusts Fred to defend him against the six-legged Venusian pipe spiders and the hard case lobster while he knocks out the plugs and restores the flow. Full accompanying music and effects, options and hi-score table.

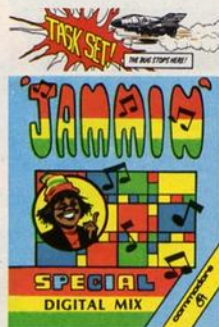
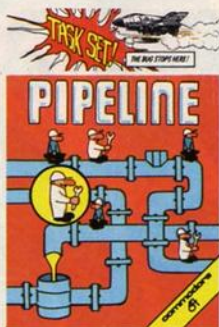
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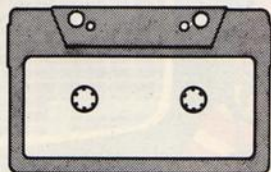
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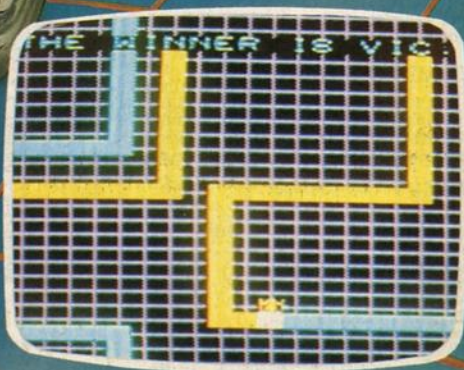
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