HOME COMPUTING WEEKLY
AN ARGUS SPECIALIST PUBLICATION
March 19-25 1985 No. 104 45p



Sony Hit Bit review



Exclusive reviews!

Superior's Tempest
Alligata's latest
Blagger

Helping hand from Seiko



A wrist-held terminal, is the latest gadget from Seiko.

The terminal is fitted into a watch case and is capable of storing up to 80 screens of information.

The screens can be appointments, telephone numbers, alarm settings — or even information for cheating in exams.

At the moment only C64 software is supplied with the wrist terminal but A 'n' F has been commissioned to write versions for Sinclair and Acorn. These are expected to be ready by the April release date.

The watch is graphically presented on your computer screen and you load information into the 2K terminal memory. The connecting cable plugs into the user port of the C64.

The unit also functions as a watch, an alarm and gives worldwide time checks. Its display is made up of a liquid crystal unit with two lines of 12 characters.

Software is supplied on both cassette and disc. The price is yet to be decided. A Seiko spokesman commented: "We expect this to be about £119."

However, it's an expensive way to cheat in exams.

HCW will be reviewing the wrist terminal in the near future.

Sinclair send-up

April Fool's Day is still some weeks away, yet Micromega has just released a spoof game based around the life of the man behind the C5.

A Day in the Life follows the progress of a bearded, bespectacled character who is on his way to the Palace to be dubbed "Dame Commander of the British Empire."

The game features Sir Clive's house, his journey to the station and even a visit to the barber, where the scissors slip and the famous beard is lost.

The Sinclair C5 puts in an appearance, but Sir Clive doesn't ride it at any stage.

Sir Clive was unavailable for comment as we went to press but our reviewer has made his comments inside this week's HCW.

One screen from A Day in the Life



Paying bills in comfort



Princess Di at the Daily Mail Ideal Home exhibition

Princess Diana gave the royal seal of approval to the Daily Mail Ideal Home exhibition at Earls Court, where Prestel was demonstrating two new features.

Now you can pay your bills and order — and pay for — computer equipment using your computer and Prestel.

The Bank of Scotland is the first bank to set up a home banking system. Account holders can pay bills, call up balances and statements and shift funds from one account to another, through Prestel.

Accessible for 17 hours a day — 15 at weekends — the service is aimed at both home and business users. And according to Maureen McCullie at the Daily Mail Ideal Home exhibition, the response so far has been tremendous. "You don't have to be near a Bank of Scotland branch to make use of the facilities," she said.

And security isn't a problem according to Ms McCullie. "You need four separate codes to access the information. They are a combination of letters and figures, upper and lower case, so there's something like 200 billion configurations. We feel quite secure about it, after extensive testing."

Littlewoods has also combined with Prestel to produce Shop TV. Customers can order electrical equipment at competitive prices and have it delivered within 14 days. Amstrad and Commodore machines and add-ons are available, and payment is by credit card.

"Littlewoods is very keen to develop this service and it's very much a thing of the future," said Anne Isaacs of Littlewoods.

Inside your bolder, brighter, better HCW...

Pull-out jargon guide Don't be baffled!

Explode your BBC's characters

Warnes Wipers Special offer cassette labels

Give your Amstrad the gift of the gab

Rhyme Land

An entertaining educational game where children can develop their skills of logic and deduction, improve their reading and spelling, and at the same time have tremendous fun. Explore country paths, fields, woods and other pleasant places, where you will encounter many interesting characters, such as the Crooked Man, Little Bo-Peep, and discover hidden objects, which you will need in order to help these nursery rhyme characters. For example, you must fetch water for Jack and Jill, and can help the Crooked Man by looking for his sixpence.

There are thirty-three locations to explore, many having colourful graphics and amusing sound effects. The game has a large vocabulary and all spelling is guaranteed correct. Age 6 and above.

CBM 64, AMSTRAD, MSX, SPECTRUM 48K

Graphics and Text 48K



MAIL ORDER 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT CARD SALES HORLEY (02934) 6083

HOME COMPUTING WEEKLY

CONTENTS

March 19-March 25, 1985 No. 104

COMMODORE 64
Expanding your C64 31

BBC
Exploding the character set 15

AMSTRAD CPC464
How to draw 27

ORIC
Take your pick 32-35

REGULARS
News 4-6
Micro Library 14
Reviews 18-22
Letters 41
Gallup chart 42
System 3 competition 43
Classified ads start on 44
Readers' page 46

SPECIAL FEATURES
Write 'n' wipe 8
Music and the micro 10
Sony HB-75B — it's a hit! 11
Teach yourself jargon 23-26
Amstrad speech synthesizer 29

SPECTRUM
Back to basics 16
Music maker 36-40

COMING SOON...

- Altered states — first in a series on how to convert programs for different micros
- Animating characters on the BBC
- Swot spot: news from the education front
- How to program your TI

Soapbox

The results of our last survey showed that the majority of HCW readers are male and this seems to be a fairly accurate reflection of the world of computing as a whole.

There is no reason why there should be fewer women involved in this young industry, apart from the fact that society as a whole still continues to steer women away from new technology towards more domestic subjects.

However, there is nothing about the computer world that purposely discourages the involvement of women, apart from the occasional strip poker style program.

Computer magazines are a beautiful example of the non-sexist aspect of computing. All articles, news items, columns and advertisements are aimed at "the computer user" — male of female — and while this is the case there is no need for such insulting additions as women's pages containing trite cliches like knitting programs. **G.K.**

Editor Dave Carlos
Deputy Editor Liz Graham
Editorial Assistant Marie Curry
Software Assistant John Donovan
Design MM Design
Group Editor Wendy Palmer
Copy Control Kerry Fowler
Sales Executive Ian Atkinson
Divisional Ad. Manager Chris Northam
Classified Advertising Becki Wilson
Publishing Director Peter Welham
Chairman Jim Connell

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

Home Computing Weekly is published on Tuesdays. Subscriptions and back issues: Infonet Ltd, 10-13 Times House, 179 Marlowes, Hemel Hempstead, Herts HP1 1BB. 0442 48432. Trade distribution: Argus Press Sales and Distribution Ltd, 12-14 Paul Street, London EC2A 4JS. 01-247 8233. Printed by Alabaster Passmore & Sons, Ltd, of London and Maidstone, Kent. Design and origination: MM Design, Circus House, 26 Little Portland Street, London W1N 5AF

BASIC LIVING

by Jon Wedge and Jim Barker



The Computer Dictionary by Jon Wedge and Jim Barker available from A & C Black, price £3.95

Devilish modem

Those who have been reading the news for a few months will have heard all about the Unicom Modem. It's available now and has appeared under a new name.

The Demon Modem, priced at a devilish £49.95, has auto dial, auto answer half and full duplex facilities. Not included in the price is the software which you need in order to access the major databases.

BBC software is already available in ROM at £23 including an auto dial facility, printer routines and remote operation. Software for Electron, Amstrad, Commodore and Sinclair is due for release next month.

Anyone using a Demon at this moment is likely to burn in Hell if British Telecom finds out. The modem isn't yet approved for connection to the public system. This official approval is expected before the end of the month.

Rushworth Dales, 20 Orange St, London WC2



Dial a Demon

Sparkling new range

Creative Sparks, publisher of Macbeth and Danger Mouse, is to release a new budget range of games under the banner Sparklers.

The games, not due for release until April, will cost £2.50 each and are being produced to market some of the games which have been submitted to the company by amateur writers.

Sandy Mackenzie, Creative Spark's home computer software manager, claimed: "low price does not need to mean low quality. With Sparklers we will prove that you can offer good playable games with nice graphics and still charge only £2.50."

First releases will include games for the Spectrum, Commodore 64, VIC-20 and other popular machines.

Creative Sparks, Thomson Hse, 296 Farnborough Rd, Farnborough, Hants GU14 7NF

Magic prize

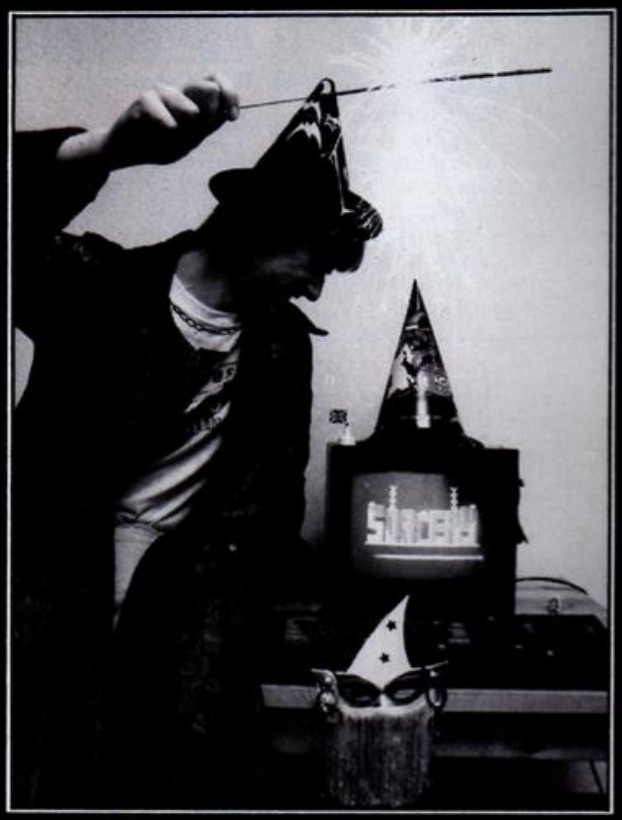
Sorcery, one of the games donated to the Soft Aid Spectrum tape, has cast a spell over it's players. One of them has recently won a trip to New York.

Leslie Loftus, who uses a C64, found his prize holiday beneath Stonehenge. This information won't spoil the game for other players, as the graphics really are quite stunning.

HCW's resident Amstrad fanatic was almost overcome on seeing the CPC464. We remember his wild enthusiasm when every brick was shown in wonderful detail. It certainly cast a spell over him.

Virgin's Managing Director, Nick Alexander, needed convincing that the game was worth converting for the Amstrad. It has sold 10,000 Amstrad versions to date and Nick is reported to be eating a large trilby hat.

Virgin Games, 2-4 Vernon Yard, Portobello Rd, London W11 2DX



Bright spark programmer Dave Chapman

Software update

A bumper crop of new programs this week is boosted by the release of older titles adapted for new machines.

Principal game of the week has to be the Soft Aid compilation tape, now available for the C64 and Spectrum at just £4.99. Of this about £3 will go straight to the Band Aid trust (and 75p to the VAT man). Don't just buy this for the excellent games, think of it as helping your fellow, non computer owning, man.

The Hobbit is spreading it's wings — well it's hairy feet — and is now to be seen on Amstrad and MSX machines. Also from Melbourne House's antipodean programmers comes Forth for the C64. Perhaps it will take over from BASIC one day. Other conversions include Sorcery, now on MSX, and Note Invaders for the C64.

Activision's disc only titles look very exciting. Both are hailed as computer novels and require the disc in order to provide all the locations and clues.

Kissin' Kousins, from English Software, looks quite weird. It features gogglers, pogopoppers, rubber frogs and toadstools. Just the game for a quiet night unless you're of a nervous nature.

Intrigue is releasing two new titles for the TI. Shuttle Attack is the first full flight simulator for the TI and Panic is bound to go down well, it features the Titanic. Intrigue is working on games for the Amstrad. Watch this space for more details.

Soft Aiders





Title	Machine	Price	Publisher
Pole Position	Atari,C64	9.95	US Gold
Up 'n' Down	C64	9.95	US Gold
Conan	Atari,C64	14.95	US Gold
Bruce Lee	Spectrum	7.95	US Gold
Buck Rodgers	C64	9.95	US Gold
Drop Zone	Atari	9.95	US Gold
Answer Back — Sport	BBC, Electron	9.95	Kosmos
Gold Dust Island	BBC	19.95	Jaracanda Wiley
Quick Cartage Company	BBC	19.95	Jaracanda Wiley
Raft Away River	BBC	19.95	Jaracanda Wiley
Scavenger Hunt	BBC	14.95	Jaracanda Wiley
Cunning Running	BBC	14.95	Jaracanda Wiley
Sheep Dog Trial	BBC	14.95	Jaracanda Wiley
Decision Maker	Amstrad		Amsoft
Project Planner	Amstrad		Amsoft
Masterfile	Amstrad		Amsoft
Olympic Skier	C16	5.99	Mr Chip
Darts	Spectrum	4.50	Slogger
Grand National	Spectrum	6.95	Elite
Brawn Free	Amstrad	2.00	Nemesis
Maverick	Spectrum	5.95	CCS
Nato Alert	Spectrum	5.95	CCS
War 70	C64	6.95	CCS
Fist full of Fun	BBC,C64	9.95	Alligata
Jammin'	Amstrad	8.90	Task Set
Mickey's Magic Mixture	BBC	10.00	Selective
Ring of Darkness	Amstrad	9.95	Wintersoft
Sam Stoat-Safebreaker	Spectrum	6.95	Gremlin Grphcs
Light Magic	Spectrum	14.95	New Generation
Moon Buggy	Amstrad	7.95	Anirog
Petch	C16	6.95	Anirog
Sprite Machine	C64	9.95	Anirog
Kissin' Kousins	BBC, Electron	4.95	English
Tracer Sanction	C64	19.99	Activision
Mindshadow	C64	19.99	Activision
Leonardo	Spectrum	9.95	Creative Sparks
Ice Palace	C64	7.95	Creative Sparks
Emerald Isle	Amstrad, BBC, C64, MSX, Spectrum	6.95	Level 9
The Chess Game	C64	7.95	Micro Classic
Tower of Despair	C64		Games Wrkshp
Velnor's Lair	C64	2.99	Atlantis
Nicotine Nightmare	Spectrum	2.99	Atlantis
Self Destruct	Spectrum	2.99	Atlantis
El Dorado	Spectrum	1.99	Atlantis
Death Race	VIC-20	1.99	Atlantis
Super Break-out	VIC-20	Atlantis	
Boardello	MSX		Bubble Bus
Wizard's Lair	Spectrum		Bubble Bus

Aquarius games cheap

Calling all Aquarius Users! Aquarius User Ltd, the official owners' club, will be selling software at the reduced price of just £3.50 per program.

Titles such as Ed-On, Phrogger, Millypede, Mazantics and Postman Pot are on offer and the price includes postage and packing. Those still living in the Age of Aquarius should contact the club at the address below.

Aquarius User, 20 Orange St, London WC2H 7ED

Amstrad thumbs up

Things are looking up at Amstrad. The company's half-year profits have been announced recently, and sales of the CPC464 computer have added to the figures.

A spokesman for Amstrad said: "Sales of 200,000 computers last year have given great impetus to our profits and we are predicting sales for next year of 600,000 worldwide."

"We plan to expand the computer side of the business with more models and a great deal more software. The software is ever expanding and we are releasing more each day. We are moving into business and tutorial programs as well as better, more interesting and involved games."

He claims that the user club has also been a great success and people aren't joining just for the discounts on Amstrad products. "Some users like to be able to join a club, it gives them security and they get a year's supply of the club magazine too. They get advice, help and software catalogues; what is more they fell close to Amstrad's operation."

With their CPC464 voted Computer of the Year in the recent industry awards by the Computer Trade Association it looks as though 1985 could be even rosier for Amstrad.

Amstrad, 1/9 Garman Rd, Tottenham, London N17 0UF

Arnold grows up

Arnold is sprouting out all over. The latest add-on for your Amstrd CPC464 is a sideways ROM based Z80 assembler package from Arnor.

Sideways ROMs are programs designed not to take up any user memory but to be always available for use. They occupy the same memory locations as normal memory and are pages in and out as required.

Arnor's ROM plugs straight into the Amstrad and still allows connection of both disc drives and other ROM cartridges.

MAXAM, the assembler program, is very powerful allowing the user to include the assembler statements in normal BASIC programs so they are assembled automatically when the program is run.

There is also a text editor and this can be used as a simple word processor. The complete package, including the extra circuitry and connector, is priced at £59.90.

Arnor, PO Box 619, London SE25 6JL

Amstrad group

Nick Godwin, founder of ZX Exchange user group, has recently set up a new postal user group dedicated to the Amstrad CPC464.

The aim of the group is the exchange of programs and programming ideas so members can share experience and expertise. An added benefit is link-ups between program writers with similar interests who can then correspond freely.

The group will publish a newsletter every two months containing reviews of software books and other information for Amstrad users. A copy of the inaugural issue is available at 50p from the address given below.

The first issue contains details on graphical displays of circles, which can be produced without using SIN and COS and without interference patternsn spoiling the display.

Nick Godwin, CPC464 Group, 4 Hurkur Crescent, Eyemouth, Berwickshire, Scotland TD14 5AP

Oceans of winners

There were 120 winners in our Ocean competition. The top 10 Spectrum winners are: T O'Malley, Manchester; Chris Crane, Trentham; Paul Serbert, Harrogate; Kevin Rincrose, Brixworth; Keith Mawson, Slough; Mike Turl, Berkely; Stephen Mulgrew, Glasgow; Ian Murphy, Liverpool; Jonathan Leach, Sidmouth; Carl Sayer, Bodham.

The top 10 C64 winners are: Simon Thorpe, Wariwck; Niloy Acharyya, Hull; Saleem Butt, Mitcham; Martin Gaskell, Skelmersdale; Alan Hake, Aberdeen; Gary Solomon, London; George Rose, Nottingham; Darydd Tudor, Treffynnon; Lee Joyce, Northolt; L Rowland, Wantage; Ming Pun, Birmingham; Nigel Morris, Abertillery; Antony Towers, Blackpool; Andrew Morrison, Alloa; Richard Gordodecky, Wembley; Allistair May, Moray; J Hughes Cadishead; Peter Attwood, Warley; Mark Aldorino, North Gorge, Gibralter; Christopher Chew, London; Don Ramsay, Bradford; Kevin O'Connor, Airdale; C Duffy, Fleetwood; E Dix Perkin, Steeple Ashton; M Pepperrell, Feltham; Tracy Bashford, London; T Carins, Glenrothes; D Brown, Winchester; Simon Melarangi, Runcorn; Ian Graham, Lanarkshire; Carl Cummings, Manchester; Steven Ferrett, Sheffield; Morris Corbett, Dingwall; MV Priestam, Birmingham; K Chua, Birmingham; Richard Hurst, Huddersfield; Daniel Cole, Basingstoke; Ian Johnson, Chelmsford; Hugh Donnelly, Belfast; Paul Daniels, Redditch; FA Beale, Blandford Forum; Dennis Richards, London; CA Elms, Rochester; Craig Alcock, Leamington Spa; SE Reeve, London; Stephen Silkstone, Derby; Peter Bosweall, Cardiff; Barry Hilton, Polegate; Kevin Ladyman, St Albans; S Ackerman, Mitcham.

The 50 C64 runners-up were: Paul Nash, Cheadle Hulme; W J Kingsbury, Barry; A G Samworth, London; Richard West, Aberdeen; John Wright, Dundee; Chris Whitehead, Manchester; S Pyle, Coventry; Brian Christie, Belfast; Scott Drane, Harlow; Andrew Morris, Southam; Stehen Foy, Bexleyheath; Anne Blair, Wildenrath, W Germany; Keith Marsh, Axminster; Nick Bell, Glasgow; A Watt, Gosforth; Gary Howell, Haversfordwest; J Brooks, Weymouth; A Atkin, Sheffield; D Roebuck, Lymington; Allan Haigh, Huddersfield; Jason, Ratcliffe; Andrew Warden, London; James Yarker, Pickering; B E Roberts, Flint; Timothy Salter, Ivybridge; Adam Poole, Southwell; Steven Treasure, St Annes-on-Sea; Paul Buckton, Boneham Wood; Chris Marshall, Sheffield; A Rahman, Nottingham; Neil Glew, Keyworth; Douglas Bayliss, Telford; Darren White, Whitstable; B D Everingham, Romford; T Dutton, Westerham; A F Turner-Howe, Basingstike; David Swain, Ilford; P Shepherd, Woodthorpe; Joey Poole, London; D R Matless, Norwich; D P Reynard, Bradford; Sean Conway, Kilkenny; Mark Bolders, Antwerp, Belgium; H J Gough, Hersham; J Strachan, South Ruislip; Mark Priddey, Birmingham; Lee Russell, London; Chris Iriri, London; Andrew Heathcote, Sheffield; Kayvan, Moghadam, London.

Free read

Free magazines on offer and all you have to do is ask!

Activision, publisher of chart topper Ghostbusters, has published the winter edition of Software Club News. The magazine is 16 pages long and is likely to be of particular interest to C64, Spectrum and MSX users.

There are news, reviews and articles in the magazine, on offer to anyone who writes or phones Activision with a request before the end of the month.

Activision, 15 Harley Hse, Marylebone Rd, London NW1. 01-486-7588



Free for the asking

The **BATTLE STRATEGY PROGRAM FOR YOUR CBM 64**

RAID on BUNGELING BAY

OUT NOW ON CASSETTE & DISK

U.S. TOP 20 HIT



A STEP BEYOND *'BEACH HEAD'*

'I found the action very fast and furious, especially when bein attacked by jet fighters firing heat-seeking missiles. It reall gets the adrenalin going . . . Superb graphics that we hav come to expect from USA imports. The attractive packagin and first class presentation add up to a truly professiona game'.

Tom Hussey

POPULAR Computing WEEKLY



Features

- KEYBOARD OR JOYSTICK CONTROL
- REALISTIC HELICRAFT CONTROLS
- 360° SCROLLING SCREEN
- UNLIMITED MISSILES & FUEL SUPPLY
- RADAR SCREEN
- DAMAGE REPORTS & BOMB LEVEL REPORTS

Plus ENEMY BATTLESHIP STATUS REPORTS & BOMBER ATTACK WARNINGS

INCLUDES SPECIAL **DISCOUNT** VOUCHER





The Bungeling Empire is out to destroy civilisation as we know it.

ariola soft

SPECIAL OFFER

Warnes Wipers is offering you the chance to smarten up your cassette library with these correctable labels — at a reduced price

WRITE 'N' WIPE AT A SPECIAL PRICE



This week's special offer could prove a boon for all frustrated computer users. No more scribbling out names of old recordings, or sticking on messy bits of labels. With Warnes Wipers you can wipe labels clean, so your cassettes always maintain that professional look.

Warnes Wipers, in conjunction with Home Computing Weekly, is offering a special set of nine adhesive labels, for use with cassettes. Included in the bargain price of £1 is a Wipers pen, with which to personalise your labels. And it's all yours post free.

Once you've started using Warnes Wipers, you won't want to use anything else. Each time you want to alter your label, you just wipe over it with a damp cloth, then write in your new title.

Normally available from Boots and Tandy, or by mail order direct from Warnes, these correctable labels are yours at a reduced price. HCW reviewers put the labels to the acid test, and this is what they said:

"A real boon to the home programmer. Simplicity to use, the DWs look good on the cassette and effectively and speedily give a better-than-new appearance." **D.H.**

"A really 'neat' product — quite literally. This product will be invaluable to anyone who frequently changes the contents of cassettes." **D.N.**

"The Data Wipers write 'n' wipe disc labels have arrived just in time. On some of my older discs the labels are stuck three deep and I can't get them in the drives anymore! Now you can re-write disc labels in complete safety!" **J.R.**

Warnes Wipers cassette labels are normally available at 12 for £1.50. With our offer you effectively get three labels completely free, and it's an ideal sample package.

Here's how to get your sample kit: send off a cheque or postal order to the value of £1, made payable to Warnes Wipers Ltd, to Warnes Wipers, 23 Werter Rd, London SW15 2LL. The offer is open until April 12, 1985. You can send for as many sets of Warnes Wipers as you like, but each application must be accompanied by an original coupon — not a copy.

Warnes Wipers will then send you the kit of labels within 28 days. All enquiries should be addressed to Warnes Wipers. Tel 01-788 1782.

Warnes Wipers

Special Offer

Name _____

Address _____

_____

_____

_____

_____

Cheque/PO no. _____

Name _____

Address _____

_____

_____

_____

_____

_____

Please complete clearly and fully — this coupon will be used as a label. If you do not wish your name to be used for mailing purposes, please do not fill in your name and address twice.

Make sure to enclose your cheque or PO made payable to Warnes Wipers Ltd with your coupon. Only one coupon per set is allowed. Closing date: April 12, 1985. Send to Warnes Wipers, 23 Werter Rd, London SW15 2LL.

The Band's On The Run!

...7 busy characters, 10 lost chords, 15 hours, 48 Traffic Wardens,
95 London Tube Stations, 126,720 square feet of London,
7 million Londoners... 943 action filled screens.

PAUL McCARTNEY'S *Give my regards to*

BROAD STREET

The new single is missing and the band have gone home for the weekend — leaving you just 15 hours to re-create the missing tune.

A race against time around London to find each member of the missing band. You have to watch out for blue meanies, wardens and Rath! A clever strategy game, full of excitement, brilliant graphics and all wrapped-up with McCartney music!





MIND GAMES

Argus Press Software Group

© 1985

Argus Press Software
Liberty House, 222 Regent Street, London W1R 7DB

For the Spectrum and Commodore £7.99

Available from W H Smith, Menzies, Laskys and all good computer stores

DAILY EXPRESS says 'STUNNING'

MUSIC AND THE MICRO



In the first of a regular series, James Russell looks at sound and the home computer. There's a test program for you to experiment with, too

Welcome! This regular column is designed to help you explore the musical capabilities of your micro, whatever it is. Over the coming months, we'll be looking at how sound is programmed on different machines, reviewing music software, and, with a bit of help from you, the reader, informing and entertaining each other with tips and programs. You don't have to be an expert, you don't have to be musical, you just have to be keen.

At the simplest level, music is just sound, and sound is just a vibration of the air. The number of vibrations in one second — the frequency — causes the pitch of the note to vary. As a result, rapid vibrations produce high notes and slow vibrations low notes. But notes aren't all the same length; listen to some music and you'll see that some notes last longer than others. This is the duration of the note.

If your micro supports sound from BASIC, then by consulting your manual you will find, amongst all the complicated bits, a reference to both frequency/pitch, and duration/length. Perhaps the simplest is the Spectrum with:

BEEP duration in seconds, pitch

On more sophisticated sound machines, which have the capability to play more than one note at once, called voices or channels, you need to tell your machine which channel to use, and how loud to play the note. Thus on the BBC:

SOUND channel number, loudness, pitch, duration

```
9000 REM THEME
9010 RESTORE 9500
9020 LET tempo=0.5
9030 FOR n=1 TO 15
9040 READ duration,pitch
9050 BEEP duration*tempo,pitch
9060 NEXT n
9070 STOP
9500 DATA 1.5,0,2,10,0.5,9,0.25,7,0.25,5,0.25,4
9510 DATA 3.5,3,1.5,1,1.5,0,2,12,0.5,10,0.25,9
9520 DATA 0.25,7,0.25,5,4,4
```

And on the Amstrad CPC 464:

SOUND channel number, pitch, duration, loudness

Have a look at your manual and see what's required. Then experiment with the listing below originated on the Spectrum. It's a short blast from a well-known TV series which I wrote to accompany a magazine listing.

The variable tempo varies the speed of the tune. Play around with it and see what happens! Fifteen times, the computer fetches a pair of values from those queued up in the data statements below; the first value in each pair is the length of the note, called duration, while the second value is the frequency or pitch of the note. As the note is played, it's duration is modified by the tempo at which you want it played, then the note is played for that period of time. The whole process then starts again.

If you don't have a Spectrum, then you have a bit more work to do! Unfortunately, each micro maker handles the duration and pitch with a different set of numbers, so on the BBC the note of middle C is 53, on the Spectrum it's 0 and on the CPC464 it's 478! Fun, huh?

To save you hours of aggro, the notes in the sequence above are:

C; A sharp; A; G; F; E; D sharp; C sharp;
C; C one octave higher; A sharp; A; G; F; E

Using the tables in your manual, you should be able to work them out from there! If any musicians have followed us this far, I know all those sharps look funny, but that's how the manuals show it!!

To work out the duration, look at the first number in each of the pairs of values in the Spectrum listing. That's the duration in seconds. A bit of swift multiplication should enable you to convert for your micro. Type it in and see what you get!

If you're a sci-fi fan, you should recognise the result. If you don't then check your calculations and try again!

When you get the whole thing up and running, save a copy to tape, then play around with the values; the FOR-NEXT loop should be set for the number of notes you want to play, and the DATA statements should hold enough pairs of values for each of those notes. Don't worry too much about loudness, set it to a reasonable value in the sound statement then leave it!

Next month, I'll be looking at some Spectrum music software, continuing with the exploration of sound commands, and, if you put pen to paper, reporting how readers have failed with this month's offering. Not only letters, but if you have some interesting program fragments either on tape or as printer listings, I'd be pleased to have a look at them. And if you can recommend good music software for any micro, send in the details and we'll try to get hold of it for review. The address is: Music and the Micro, Home Computing Weekly, No.1 Golden Square, London W1R 3AB

Write soon!



HARDWARE



Hit Bit plus all the trimmings

SONY HB-75B — IT'S A HIT

Mel Paszkowski reviews the Sony Hit Bit for HCW, and gives you his thoughts on MSX, computing and the universe

Coming across a new computer is like coming to terms with a romance. It comes to you full of novelty offering the promise of fresh mysteries to unravel. It's easy to be blinded by it's youthful appearance, clean lines and unsullied reputation but... is it any better than what you have, or is currently available?

I suppose it must, as always, depend on the user. You must appreciate that as far as I'm concerned I have made it my business to compare machines, and I may see their faults and virtues, but to someone who is thinking of buying a computer for the first time, there are, I suggest, other priorities — like a good software base, for example — or the stability and reliability of the company involved — not to be underestimated in the present climate!

But why an MSX at all? Firstly the amount of software. I can't really see how these machines can fail to be well provided — at the last count there were over 200 titles and growing — and this is simply because it's based on the Z80 CPU chip, which has been around for some time. That in itself can be a criticism of the machine because some people believe that in order to be good, a computer has to be state of the art. A load of rubbish! That may be valid in the higher reaches of the business world, but not with a home micro.

Secondly the company, or companies, as there are several involved. Toshiba, Mitsubishi, Sanyo, Canyon, JVC and Sony — is there anyone who hasn't heard of them? Reliability is guaranteed, I assume. But more important, just think of all the other electronic products these companies are producing. And when it comes to interfacing (connecting) them to the home Micro, then which one do you think they will use?

As an example look at Yamaha, who has linked it's MSX to a music synthesiser. I'm particularly intrigued by the prospect of interactive laser disc games — already a reality in Japan.

But having got that out of my system, let's consider the Sony HB as an example of the current MSX machines on the market.

It's one of the more expensive in the MSX range, although prices are dropping (one of the advantages of having so many machines using the same standard is that there is a lot of competition between them). In common with the others the Sony has 64K of RAM plus a 16K video display processor (VDP) — although when you switch on you see there are only 28815 bytes free. The rest is only accessible with machine code. That is, however, a lot for domestic use.

Sixteen colours are available in four choices of screen: two text and two graphics. You can also have sprite graphics in any

of four forms, varying in size. Sprites are those independent user defined graphics which give you superior control and movement. Excellent for games. Very comprehensive and standard on all MSX machines.

So what is different and why the range in price? Well you have to look at the quality of production; the machine's styling and those non-standard extras.

The Sony HB (it stands for Hit Bit and not for hard black!) comes in a black case with a black QWERTY keyboard (maybe hard black is right after all) and grey control, shift and function keys. It looks good and weighs in at about 3.5 kg. That's quite heavy, but includes the built in transformer which makes it neater and probably safer on the desktop.

The keyboard feels good and, since I touch type, I appreciated the raised dots on the F and J keys to help return to the correct home keys. Also nice was the click you could hear through your television on each depression. Small things which go towards a well thought out finish.

There is a power on/off key on the raised bank, well out of the way, with no messy fiddling about out of sight. A reset button, not standard, is included just above the back-space key, but cleverly recessed to avoid accidents whilst working.

Other common interfaces include using the Centronics Standard and two joystick ports using nine-pin connectors.

A nice extra is the RGB video output socket which allows you to connect up to a monitor for the more serious work.

There are two cartridge ports: one on top and the other at the back closed off with two screws. Either one can be used, but not, I understand, at the same time at the moment. There are warnings about switching off before placing cartridges, and it is a pity (perhaps if enough people say it...) that there isn't a reset under the port cover as in the Japanese version.

One of the main selling points with the Sony computer is the built in data bank facility which can be used in conjunction with the data cartridge. It is accessed on power up by selection with the cursor. Each data cartridge can hold 4K bytes, which amounts to about 50 records.

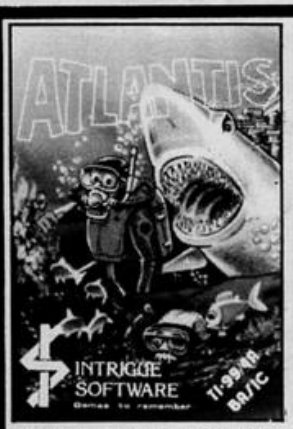
The main advantage is the speed and versatility of the system. It is operated by a 16K ROM program which doesn't take up any of the available memory and offers a menu driven search, sort and listing of files. Very easy to use.

The records can be saved on data cartridge or cassette with the ability to exchange between the two. Files can be held on cartridge even when it's removed from the machine, due to the sealed-in lithium battery which lasts up to five years. Good for domestic use, but rather expensive, since data cartridges cost £30 each.

Finally the documentation. You are provided with the Introduction to MSX Basic which, at just over 100 pages, was liberally sprinkled with programming examples, as well as a dog called Fido, who takes you through the elementary stages of setting up and learning the more straightforward BASIC commands. There wasn't enough, I felt, and you would soon find yourself in the bookshop for more.

I think there are powerful arguments for choosing MSX both in the home and to provide a link with business interests. The Sony HB, as an example of the sort of standard we can expect, is well built. Robust enough to cope with the demands of games players at home and efficient enough to work for it's living. With the addition of a Sony disc drive and MSX-DOS or CP/M, well... Perhaps I'll tell you about it sometime.

Meanwhile my whirlwind romance is over. But now that I've developed the taste for better things, I'll have to consider doing the honourable thing.



ATLANTIS. (Basic) Over 80 entirely different scenes. Even has a title screen while loading. Fully animated keyboard or joystick. Can you discover the secret of Atlantis. Take a dive for £6.95



BENEATH THE STARS (Basic) Multi Space game. 5 skill levels. See the review in Jan. issue of Games Computing. Only £5.95.



SNOUT OF SPOUT (Ext. Basic) On the planet Spout the inhabitants are all called Snout. Can you walk a Snout and save the planet Spout.



INTRIGUE PENTHALON. (Ext basic) 5 Exciting track and field events. 1 or 2 players. Packed full of real time action and **INTRIGUE ANIMATION.** Everyone will want to compete. Take your marks. Only £5.95.



QUASIMODO HELP. (Ext basic) 20 scenes to clamour across using keyboard or joystick. Very addictive, musical and colourful. Esmerelda is waiting for you. £7.95 and off you go.



ADVENTUREMANIA. (Basic) The only TI cassette game chosen by Games Computing listed in the Top 100 for 1984. Probably the most enjoyable graphic and text adventure available. 30 locations of Dungeons, Casinos, Computers, etc. £5.95 will let you decide for yourself.

Access

Telephone your order now

TI-99/4A

We have lots of exciting games. Send 50p + SAE now for a copy of our 12 page catalogue. We now stock the entire Lantern range. All orders are sent **FIRST CLASS SAME DAY.** (Games are post free inland. Overseas & Europe £1.00 extra per game.)

COMING SOON: COMING SOON: COMING SOON:

SHUTTLE ATTAK (Ext.) The most advanced Space flight simulator ever for the TI-99/4A. The game everyone is waiting for.

PANIC (Basic) Fully animated arcade adventure. Another **INTRIGUE** challenge.



QUICKSHOT 1 JOYSTICK
TI-99/4A interfaced. £13.70.
Gives fantastic control in games like Atlantis.
Spectrum/CBM Version £9.25
(Price includes 75p P & P)

Tel 05806 4726

INTRIGUE SOFTWARE

Cranbrook Road, Tenterden, Kent TN30 6UJ

GOOD BYTE

SPECTRUM	RRP	OUR PRICE
PROJECT FUTURE	6.95	5.25
EVERYONE'S A WALLY	9.95	7.25
BUGGY BLAST	5.95	4.50
DALEY THOMPSON	6.90	4.99
WHITE LIGHTNING	14.95	10.50
SHERLOCK HOLMES	14.95	9.99
KNIGHTS LORE	9.95	6.95
UNDERWORLDE	9.95	6.95
LORDS OF MIDNIGHT	9.95	5.95
DOOMDARKS REVENGE	9.95	5.95
PSYTRON	7.95	5.95
FRANK N STEIN	5.95	4.50
T.L.L.	5.95	4.50
TRASHMAN	5.95	4.50
CLASSIC ADVENTURE	6.95	5.25
MONTY MOLE	6.95	5.50
FULL THROTTLE	6.95	5.75
MATCHPOINT	7.95	6.75
AVALON	7.95	5.25
ENDURO	7.95	5.50
EDDIE KIDD JUMP CHALLENGE	7.95	4.75
COMBAT LYNX	7.95	5.25
DARK STAR	7.95	4.95
JET SET WILLY	5.95	4.50
STAR STRIKE	5.95	4.50
TRAVEL WITH TRASHMAN	5.95	4.50
BCKPCKR GUIDE TO THE UNIVERSE	7.50	4.95
QUASIMODOS RVNGE (HNCHBCK II)	6.90	4.90
TIR NA NOG	9.95	6.95
AIRWULF	6.90	5.25
MATCH DAY	7.95	5.70
PYJAMARAMA	6.95	5.25
MACHINE LIGHTNING	19.95	14.95
MONTY IS INNOCENT	6.95	5.50
GREAT SPACE RACE	14.95	4.99
POTTY PIGEON	6.95	5.25
PITFALL II	7.95	5.95
RAMTURBOINTERFACE		18.00
MATCH POINT	7.95	6.50
GIFT OF THE GODS	9.95	7.95
TRIPODS	11.50	7.50
BOULDER DASH	7.95	5.95
SPIDERMAN	9.95	6.99
GHOSTBUSTERS	9.95	7.50
SOFTWARE STAR	6.95	5.25
TECHNICIAN TED	5.95	4.75
HEROES OF KHAN	5.50	4.25
ALIEN 8	9.95	7.25
SPY HUNTER	7.95	5.95
TAPPER	7.95	5.95
VALHALLA	14.95	4.99
SAM STOAT	6.95	5.50
SPY HUNTER	7.95	5.95
MEGA HITS	19.95	14.95

COMMODORE 64	RRP	OUR PRICE
SENTINAL	9.95	7.50
GHOSTBUSTERS	10.95	8.50
SUICIDE EXPRESS	7.95	6.50
OTHER ACTIVISION	9.95	7.25
ZIM SALA BIM	9.95	6.95
PSYTRON 64	7.95	5.25
TALES OF THE ARABIAN NIGHTS	7.00	3.75
BEACH HEAD	9.95	7.50
SOLO FLIGHT	14.95	11.00
DEATH STAR INTERCEPTOR	9.95	7.50
MY CHESS II	11.95	8.25
BATTLE FOR MIDWAY	8.95	4.95
QUASIMODOS REVENGE	7.90	5.90
ZAXXON	9.95	7.50
SUMMER GAMES	14.95	10.50
SHERLOCK	14.95	10.50
PSI WARRIOR	9.95	5.99
STAFF OF KARNATH	9.95	7.25
BLUE MAX	9.95	7.50
SELECT 1	12.49	8.50
SPY VS SPY	9.95	7.50
BOULDER DASH	8.95	7.25
HOBBIT	14.95	9.99
DALEY THOMPSON DECATH	7.90	5.25
KONG'S REVENGE	7.90	5.90
FIGHTER PILOT	9.95	7.50
BREAKFEVER	7.00	4.95
COMBAT LYNX	8.95	6.95
WHITE LIGHTNING	19.95	15.95
SPIDERMAN	9.95	6.99
CAD CAM WARRIOR	9.95	7.50
F15 STRIKE EAGLE	14.95	11.70
MOTORCROSS	7.95	5.80
SUICIDE STRIKE	7.95	5.80
SPY HUNTER	9.95	7.50
IMPOSSIBLE MISSION	8.95	6.75
CASTLE OF TERROR	9.95	7.50
EMPIRE OF KHAN	7.00	4.95
SHOOT THE RAPIDS	7.95	6.50
LORDS OF MIDNIGHT	9.95	6.99
CONGO – BONGO	9.95	7.50
WORLD SERIES BASEBALL	7.90	5.90
ALICE IN VIDEOLAND	9.95	7.95
UP AND DOWN	9.95	7.50
MEGA HITS	19.95	14.95

ALL PRICES INCLUDE P&P

PLEASE NOTE IF YOUR ORDER EXCEEDS £50 YOU GET 10% FURTHER DISCOUNT

SEND CHEQUES/P.O. TO
GOODBYTE (HCW)
94 LEATHER LANE, LONDON EC1
(TEL: 01-404 4245)

ALL PRICES INCLUDE P&P

Overseas orders welcome. Please add £1.50 per order

Softschool Ltd.

presents

Timekey. 48k Spectrum **RRP £6.95**
Over 80k Adventure/Arcade.

Your Mission.
To recover several pieces of the key to time and return them to the TIME MASTERS.
You must shoot down enemy spaceships, Flying reptiles, Fighter aircraft and sink battleships

Mr Smarty 48k Spectrum **RRP£5.95**

Mental Arithmetic Fun.
Mr Smarty is a character who will do all sorts of amusing tricks provided you get your sums right. He will keep children amused for hours while they learn. First in a series of Mr Smarty's covering a wide range of educational subjects for the young.

Ages 6 to 10

Post this coupon to:
Softschool Ltd, 471 Hornsey Road, N19.
I enclose cheque/postal order for £.....
Timekey ..... 6.95 ☐
Mr Smarty ..... 5.95 ☐

Name .....
Address .....
.....
.....

qT'S Brachistochronous

SPECTRUM	RRP	4U
WEEK'S SPECIAL		
EVERYONE'S A WALLY	9.95	6.99
TOP TEN		
ALIEN 8	9.95	7.25
ANIMATED STRIP POKER	6.95	5.50
BUGGY BLAST	5.95	4.50
DUKES OF HAZZARD	6.95	5.25
EMERALD ISLE	6.95	5.25
MOON CRESTA	6.95	5.25
PROJECT FUTURE	6.95	4.95
SPIDERMAN	9.95	7.25
TECHNICIAN TED	5.95	4.50
WIZARD'S LAIR	6.99	5.25
BEST OF THE REST		
AIRWOLF	6.95	4.99
BLOCKBUSTERS	7.95	6.25
BLUE MAX	7.95	6.25
BRIAN BLOODAXE	7.95	5.50
BRUCE LEE	7.95	6.25
KNIGHTLORE	9.95	6.25
KUNG FU	6.95	5.25
MINI OFFICE	5.95	4.75
MONTY IS INNOCENT	6.95	5.25
RAID OVER MOSCOW	7.95	6.25
SOFTWARE STAR	6.95	4.99
SPACE SHUTTLE	7.99	6.25
TIR NA NOG	9.95	6.75
WITCH'S CAULDRON	6.95	5.25

COMMODORE 64	RRP	4U
WEEK'S SPECIAL		
RAID ON BUNGEL BAY	9.95	7.95
TOP TEN		
CASTEL OF TERROR	9.95	7.50
CHOPLIFTER	9.95	7.95
DEMONS OF TOPAZ	5.95	4.75
FIGHTER PILOT	9.95	7.25
GRYPHON	7.95	6.50
KNIGHTMARE	6.99	5.75
SPY HUNTER	9.95	7.50
SPY VS SPY	9.95	6.99
STAFF OF KARNATH	9.95	7.25
TAPPER	9.95	7.50
REST OF THE BEST		
ARCHON	11.95	9.50
CAD CAM WARRIOR	9.95	6.99
DALEY'S DECATHLON	7.90	5.50
FRAK	8.95	6.99
GHOSTBUSTERS	10.99	8.25
GRAND LARCENY	7.95	5.75
HUNCHBACK II	7.90	5.75
IMPOSSIBLE MISSION	8.95	6.99
JUICE	7.95	5.75
JUMPMAN	8.95	6.99
ONE ON ONE	9.95	7.95
PASTFINDER	9.99	7.99
SKRAMBLE 3D	7.95	5.25
SUMMER GAMES	14.95	10.95

SINCLAIR QL	RRP	4U
ASSEMBLER METACOMCO	39.95	34.95
ASSEMBLER C ONE	29.95	24.95
BCPL METACOMCO	59.95	49.95
CASH TRADER	69.95	55.95
CHESS	19.95	15.95
FORTH C ONE	39.95	30.95
LISP METACOMCO	59.95	49.95
MONITOR C ONE	24.95	19.95
PASCAL C ONE	39.95	34.95
TOOLKIT SINCLAIR	24.95	19.95
TOUCH 'N GO	24.95	19.95
WEST	19.95	15.95
ZKUL	19.95	15.95
AMSTRAD	**RRP**	**4U**
CENTRE COURT	8.95	6.99
DARK STAR	7.95	5.75
DEFEND OR DIE	7.95	5.75
FIGHTER PILOT	8.95	6.75
FOOTBALL MANAGER	7.95	5.95
HEATHROW ATC	7.95	5.95
HUNCHBACK	7.95	5.75
MANIC MINER	8.95	6.99
MINI OFFICE	5.95	4.50
PYJAMARAMA	6.95	5.50
SORCERY	8.95	7.50
S D SNOOKER	7.95	5.95
TECHNICIAN TED	7.95	5.99

Cheques etc, payable to:FREECREST LTD
Send to: IT'S, 33 FOSCOTE ROAD, LONDON NW4 3SE Enquiries: 01-430 2284

AMSTRAD CPC464 ADVENTURES

"NEMESIS ARNOLD ADVENTURES are like a breath of fresh air" *Tony Kendle, PCW Dec '85.*

	£
THE TRIAL of ARNOLD BLACKWOOD	6.50
ARNOLD goes to SOMEWHERE ELSE	6.50
THE WISE and FOOL of ARNOLD BLACKWOOD	6.50

NEW TITLES

ANGELIQUE: A GRIEF ENCOUNTER 6.50
"So I recommend it highly." PCW March '85.

BRAWN FREE!... a full scale adventure at a silly price — 2.00
for the would-be adventurer (Yes, TWO!) (UK only)

Chqs, POs for immediate despatch.

NEMESIS (HCW), 19 Carlow Rd, Ringstead, Kettering, Northants NN14 4DW.

TEXAS INSTRUMENTS
99/4A HOME COMPUTER SYSTEM



APPOINTED DEALER

PARCO Electrics

for a free price list and further information, send a s.a.e. to:

PARCO ELECTRICS, 4 DORSET PLACE, NEW STREET, HONITON, DEVON, EX14 8QS. TELEPHONE (0404) 44425

PARCO ELECTRICS, AM GASTHAUS 2, 2971. HINTE 2, LOPPERSUM, WEST GERMANY. TELEPHONE (04925) 1773.



MICRO LIBRARY

A mound of books has piled up in our office this week: most of them are for C64 users.

In fact, there are more books for the Commodore machine than for all the others put together. We've got a 'house full' of titles from First Publishing, whose books in distinctive blue and yellow covers have come to these shores via both Germany and America. First glance reveals them to be very detailed examinations of the subjects and likely to be of great interest to the real enthusiast. Our graphics columnist was most impressed when he popped into the office and took a look.

Adventurers have a treat in store too. We are constantly being told that this type of game is becoming more popular by the day and from the number of books currently available this could well be true.

Duckworth's adventure series covers most of the popular machines and each of these books contains a full explation of best selling adventure programs. The general book contains full details of the Hobbit and three Scott Adams adventures, all of which are sold for a number of machines.

Rather a surprise to see books for the TI still being published. Although the ones listed this week are all American imports, I'm sure they will be very popular with TI fans as they're all mixtures of text and listings.

We will be featuring book reviews on a regular basis and you can look forward to hearing more of the titles later in full reviews.

Title	Author	Publisher	Price
Commodore 64			
Tricks and tips for the 64		First	8.95
Anatomy of the 64		First	8.95
The Commodore 64 machine language book		First	8.95
Advanced machine language for the C64		First	8.95
The Commodore 64 idea book		First	8.85
Anatomy of the 1541 disc drive		First	8.95
Graphics for your 64		First	8.95
Compute!'s Commodore collection vol 1		Holt Saunders	10.95
Compute!'s Commodore collection vol 2		Holt Saunders	10.95
Compute!'s third book of Commodore 64		Holt Saunders	10.95
Commodore 64 omnibus	Lupton, Robinson	Century	9.95
Electronic music on the C64	Jenkins	Sunshine	6.95
Commodore 64 basics	Harris	Wiley	16.75
The Commodore 64 adventurer	Chappell	Duckworth	3.95
40 best machine code routines	Greenshields	Duckworth	5.95
Impossible routines for the C64	Bergin	Duckworth	6.95
Advanced BASIC and machine code	Gerrard	Duckworth	6.95
Will you still love me when I'm 64	Gerrard	Duckworth	6.95
VIC-20			
Third book of VIC	Compute!	Holt Saunders	10.95
Mapping the VIC	Davies	Holt Saunders	11.95
TI-99/4A			
Compute!'s TI collection vol 1		Holt Saunders	10.95
Extended BASIC and Home Applications	Flynn	Holt Saunders	10.95
Thirty-three programs for the TI	Flynn	Holt Saunders	10.95
BBC			
Sensing and control projects	Nunns	Microbooks	5.95
Exploring music with BBC and Electron Jones	Jones	Pitman	9.95
The BBC micro adventurer	Chappell	Duckworth	3.95
Spectrum			
The Spectrum adventurer	Gerrard	Duckworth	3.95
My Spectrum computer and me	Solomon	Duckworth	2.95
MSX			
MSX BASIC revealed	Palmer, Richards	Penguin	6.95
Amstrad			
Computer challenges	Hurley, Virgo	Duckworth	6.95
General			
Capital Radio's book of computers and simple programming	Temple	Interface	3.95
The adventurer's companion	Gerrard, Gerrard	Duckworth	3.95

EXPLODING THE CHARACTER SET



This week Shingo Sugiura explains how to redefine the whole character set on the BBC

In the first of this series I said that only characters in the range 224 to 255 may be redefined. Since the definition for the characters from 32 to 126 (0 to 31 are control codes handling various things such as printer on/off and may not be redefined) are held in ROM (read only memory), it would seem to be impossible to redefine them. However, those clever people at Acorn thoughtfully provided a command which allows you to redefine the whole of the character set. First room must be made for the new characters. This process is called Exploding the character set.

The character set is previously described as imploded). Exploding enables the user to redefine characters from 32 to 255 in steps of 32 extra characters at a time. The command to do this is *FX20,X. X defines how much memory is to be allocated for the new characters and they are as follows:

Command Memory allocation

*FX20,0	&C00 - &CFF (imploded)
*FX20,1	OSHWM - OSHWM + &FF
*FX20,2	OSHWM - OSHWM + &1FF
*FX20,3	OSHWM - OSHWM + &2FF
*FX20,4	OSHWM - OSHWM + &3FF
*FX20,5	OSHWM - OSHWM + &4FF
*FX20,6	OSHWM - OSHWM + &5FF

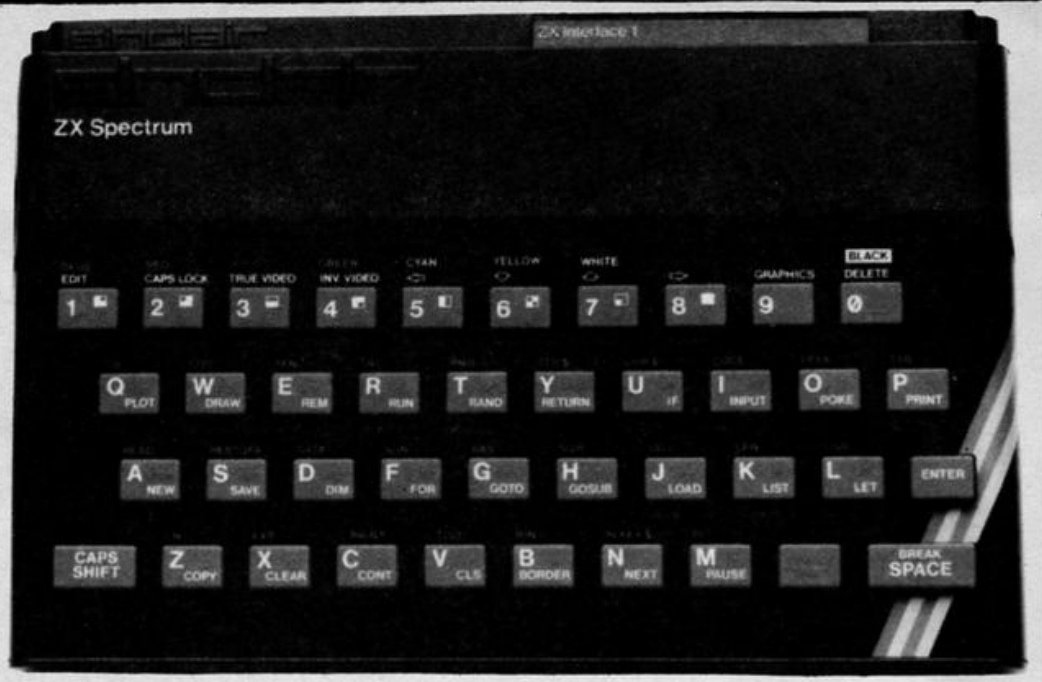
OSHWM — operating system high water mark. This is the value to which the pseudo variable PAGE is initially set to.

Using this technique, the whole character set may be redefined. Type in listing 1, which redefines it to a new Hi-tech character set. Save it under the name 'DEFINE' before you run it. Then type in:

```
PAGE = PAGE + &600
  ⟨RETURN⟩
CHAIN "DEFINE"
  ⟨RETURN⟩
```

```
10REM Hi-tech font
20REM HCW
30REM  By Shingo Sugiura
40
50*FX20,6
60PROCdefine
70PRINT"HI-TECH FONT"
80END
90
100DEFPROCdefine
110VDU23,48,&FE,&82,&82,&E2,&E2,&E2,&FE,&00
120VDU23,49,&38,&08,&08,&38,&38,&38,&38,&00
130VDU23,50,&FE,&02,&02,&FE,&E0,&E0,&FE,&00
140VDU23,51,&FE,&02,&02,&7E,&0E,&0E,&FE,&00
150VDU23,52,&80,&80,&C4,&C4,&FE,&1C,&1C,&00
160VDU23,53,&FE,&C0,&C0,&FE,&0E,&0E,&FE,&00
170VDU23,54,&FE,&80,&80,&FE,&E2,&E2,&FE,&00
180VDU23,55,&FE,&02,&04,&18,&38,&38,&38,&00
190VDU23,56,&7C,&44,&44,&FE,&E2,&E2,&FE,&00
200VDU23,57,&FE,&82,&82,&FE,&0E,&0E,&FE,&00
210VDU23,65,&7C,&44,&44,&FE,&E2,&E2,&E2,&00
220VDU23,66,&FC,&84,&84,&FE,&E2,&E2,&FE,&00
230VDU23,67,&FE,&82,&80,&E0,&E0,&E2,&FE,&00
240VDU23,68,&F8,&84,&82,&E2,&E2,&E4,&F8,&00
250VDU23,69,&FE,&82,&80,&FC,&E0,&E2,&FE,&00
260VDU23,70,&FE,&80,&80,&FC,&E0,&E0,&E0,&00
270VDU23,71,&FE,&82,&80,&EE,&E2,&E2,&FE,&00
280VDU23,72,&82,&82,&82,&FE,&E2,&E2,&E2,&00
290VDU23,73,&10,&10,&10,&1C,&1C,&1C,&1C,&00
300VDU23,74,&FE,&10,&10,&70,&70,&70,&F0,&00
310VDU23,75,&82,&82,&8E,&F8,&EE,&E2,&E2,&00
320VDU23,76,&80,&80,&80,&E0,&E0,&E0,&FE,&00
330VDU23,77,&FE,&8A,&8A,&EA,&EA,&EA,&E2,&00
340VDU23,78,&FE,&82,&82,&E2,&E2,&E2,&E2,&00
350VDU23,79,&FE,&8E,&8E,&8E,&82,&82,&FE,&00
360VDU23,80,&FE,&82,&82,&FE,&E0,&E0,&E0,&00
370VDU23,81,&FE,&86,&86,&96,&8A,&86,&FE,&00
380VDU23,82,&FC,&84,&84,&FE,&E2,&E2,&E2,&00
390VDU23,83,&FE,&82,&80,&FE,&0E,&8E,&FE,&00
400VDU23,84,&FE,&10,&10,&1C,&1C,&1C,&1C,&00
410VDU23,85,&82,&82,&82,&E2,&E2,&E2,&FE,&00
420VDU23,86,&E2,&E2,&E2,&E4,&24,&24,&3C,&00
430VDU23,87,&82,&8A,&8A,&EA,&EA,&EA,&FE,&00
440VDU23,88,&82,&82,&EE,&38,&EE,&E2,&E2,&00
450VDU23,89,&82,&82,&82,&FE,&0E,&0E,&FE,&00
460VDU23,90,&FE,&02,&0E,&F8,&E0,&E0,&FE,&00
470ENDPROC
```

BACK TO BASICS



In part two of Colin Wilton-Davies' series, he shows you how to set up simple programs, like multiplication tables

I hope those of you who started to explore Spectrum BASIC with me last week because you were bored with zapping aliens didn't get equally bored with the idea of programming! Admittedly, no one could get too excited by the little program we ended up with:

```
100 FOR c=1 TO 12
110 PRINT c*7
120 NEXT c
```

All it does is print, in a column, the products of seven and the integers from one to 12. I'm sure most of you could see that for yourselves, but with a more complicated program it is surprisingly difficult for even it's author to remember what it was supposed to do when it is resurrected after a few months.

BASIC fortunately allows us poor humans to write little reminders to ourselves in the shape of REM statements (short for REMARK). It is good practice to get into the habit of using these fairly liberally in your programs. Anyone who has been in the position of having to get bugs out of someone else's program or of having to adapt a program to particular needs will endorse this. In Spectrum BASIC, when your cursor is flashing 'K', pressing the 'E' key will produce the 'REM' keyword on the screen. Add this line to the program:

```
50 REM print out the seven
   times table
```

and when you RUN it, you get exactly the same result as you did before. The REM statement is for humans, and the computer will ignore anything written after it in a program line. Now let's make the program really do what REMark says; at present, it doesn't print the proper table, just the products. It would help if we had some words as well as numbers — to do this, we have to use the quotation marks, which we get by pressing SP (symbol shift) and P together. Insert the line:

```
60 PRINT 'Seven Times Table'
```

Now when you run the program, the heading 'Seven Times Table' is PRINTed above the column of figures on the screen. Press the ENTER key, and the LISTing of your program replaces the column of figures and the heading, with the ' X' pointer at line 60, the last line you entered.

Now press the down arrow (C6), and the pointer moves down to the next line, which is line 100. Press 'EDIT', then 'DELETE' three times, and the '100' will disappear from the editing line at the bottom of the screen; replace it with '70', and press ENTER.

Now you have two lines with the same instructions; get rid of the second by typing '100', it's number. Now enter this new line:

```
80 PRINT c;
```

and don't forget the semi-colon. The semi-colon tells the Spectrum not to print a space or new line after PRINTing the value of the variable 'c'. If you RUN the program now, there will be no separation between 'c' and it's product, so we also need the line:

```
90 PRINT " times 7 = ";
```

Notice the space just inside each quotation mark: this makes things look tidy in the output. Now when you RUN the program, you really will get the seven times table, but it still needs a bit of tidying to make it perfect — notice how the nice neat columns have gone askew where 'c' has increased from one to two digits in length.

Let's try the 'TAB' function, which is like the TABulator key on an office typewriter, but more controllable. On the Spectrum, TAB is obtained by first pressing CAPS SHIFT and SYMBOL SHIFT together, then 'P' (XP in my shorthand). EDIT line 90 to read:

```
90 PRINT TAB 3; " times 7 =
   ";
```

and you have your output in tidy columns. TAB 3 means 'move the printing position right to the third position on the current line', and if the print position was already past this, it would have no effect.

I suggested SAVEing your first program as 'seven', so as to avoid confusion, SAVE this one as 'table7'. Supposing your younger brother, with the Spectrum's assistance, has now learnt his seven times table by heart. You could now go on to write programs for the six, five

and four times table, but this would be a waste of effort. Instead, let's put the program more under the user's control. Delete lines 50 and 60, and enter:

```
10 REM print multiplication
   tables
50 INPUT number
```

The 'INPUT' statement is obtained by pressing the 'I' key when you have a keyword cursor (flashing 'K'). The Spectrum waits at this line for you to type in a number, and when you press ENTER, stores the number as a variable called 'number'. Now EDIT lines 90 and 110 to read:

```
90 PRINT TAB 31; " times ";
   number;" = ";
110 PRINT c*number
```

RUN this; the screen goes blank, except for the flashing 'L' cursor at the bottom. You must remember that the Spectrum is waiting for you to type a number and press ENTER. This is not what is called "user-friendly"; enter a number for now — say three — and you will get your three times table. Now add these lines:

```
40 PRINT "Type a number and
   press ENTER"
60 PRINT number;" Times
   Table"
```

See the difference? The program is much more versatile than our first version, but easier to use, because we are prompted by the computer. The last thing we need to do is get rid of the words "Type a number and press ENTER" before the table is printed. The simplest way to do this would be to insert a 'CLS' (CLear Screen) statement as line 55, but a better way is to use the INPUT statement to do the prompting.

Anything in quotation marks between the INPUT itself and the name of the variable to be INPUT will be printed at the bottom of the screen until you have pressed ENTER; then it will disappear. You could EDIT line 50, but there is less typing if you EDIT line 40 to:

```
40 INPUT "Type a number and
   press ENTER";number
```

and of course, get rid of line 50 by entering 50. Now when you RUN the program, you have a prompt which disappears after use, and a nice neat output. SAVE the program now: 'tables' would be a good name.

Something may be puzzling the most observant of you. I've only used two variables in this example, and I called one of them 'number'; it makes programs easier to read and understand if variable names are self-explanatory.

'OK', you might say, 'Why not call the other one 'count', then?' I would like to, but it is built in to Spectrum BASIC that 'control' variables, as they are called, have to have single-letter names. Play with the program, and you will find that you don't have to restrict your INPUT to positive integer numbers, or even to just numbers.

A great strength of Spectrum BASIC is that you can INPUT 'expressions', and these will be accepted if they are valid. Try INPUTting '-1.5','PI' (XM) or 'SQR 5' (XH5) (which means 'the SQuare Root of 5') as valid expressions, and 'SQR -5' as an invalid expression; notice the helpful 'Error message' you get in the last case. You can build up very complex expressions by using brackets, and the Spectrum error-checking procedures will make sure you use as many right- as left-brackets — try it!

Next time, we'll experiment with colour and sound on the Spectrum.

Programs are always supplied on cassette and are accompanied by full details of the program variables, how the program works and any hints on conversion you can offer. Please type these details double spaced. Listings are helpful but not essential. What is vital is that the programs should be completely error free, so please double check.

Always use a coupon firmly fixed to the back of your envelope, and fully complete and enclose the cassette inlay card.

We are particularly interested in programs with less than 100 actual lines of BASIC. All submissions are acknowledged.

Send your programs to HCW!

Use this cassette inlay card for your program

Name _____

Address _____

_____

_____

_____

_____

Expansion needed _____

_____

Special loading instructions _____

_____

Program title _____

Machine _____

HOME COMPUTING WEEKLY

Program submission _____

Complete this coupon and stick it firmly on the back of your envelope

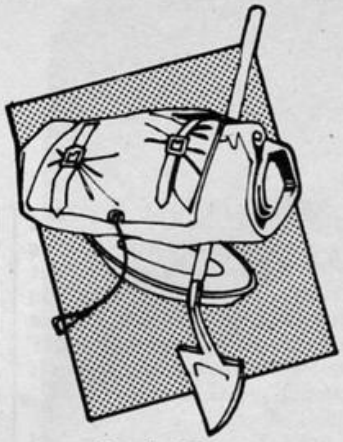
Name _____

Address _____

_____

Program title _____ **Machine** _____

SOFTWARE



Dark Tower

In this graphical adventure from Melbourne House, you play the part of Prince Harry. This unfortunate individual has been zapped by the guardian of the dark tower and has mutated into a being not dissimilar to a green potato with legs. The aim is simple, you must collect all the jewels from the 28 rooms in the tower. Once this is done, you have a final room to solve.

Each room has the usual ladders, platforms, ropes etc to enable you to collect the jewels which are protected by a wide variety of robots and other objects, each patrolling a specific area. The problem is to sort out the exact sequence of jumps, moves and other activities necessary to collect the jewels. Hence, this game requires great patience and dexterity. If you collect all the jewels in a room, you get a code letter. The first 500 people who use these 28 letters to solve the final problem will win a free game.

Graphically, this game is well designed but not exceptional. The background music, however, is superbly written and arranged. The degree of difficulty of the screens varies markedly. Pavloda is used with a few tweaks which give a pretty, high-resolution picture. Loading was fault free. Some are quite simple whilst some are diabolical.

Whilst I enjoyed this game, it isn't particularly original and not quite as addictive as some. Notwithstanding this reservation, this game is certainly worth checking out.

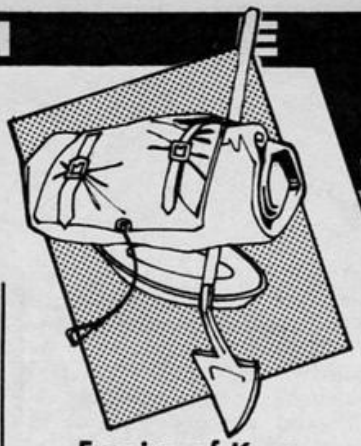
M.W.

Price: £6.95

Publisher: Melbourne House

Address: Castle Yard House, Castle Yard, Richmond, TW10 6TF

C64



Empire of Karn

After the success of Heroes of Karn, it isn't surprising that a sequel has been written. In fact, according to the inlay, a third part should appear in due course. The inlay carries the usual background facts full of mysticism and unpronouncable names. It appears that you join up with a fellow called Darin and set forth on a quest to foil the evil intentions of Zheff — I think.

Compared to the previous adventure, this game shows a number of technical improvements in keeping with the state of the art. The program loads quickly using Interceptor's own turbo loader with no glitches. The first real advance is the improved speed of drawing the various scenes. Multicolour mode is used to produce quite acceptable results. Raster interrupts are used to give text and graphics simultaneously. The textual descriptions of each location are fair but hardly earth shattering.

Another advance is the use of interaction with other characters to provide greater interest. The command parser is fairly competent and will allow you to converse with other characters. One surprising ommission, however, is the absence of commands such as 'Examine'. This proved to be rather irritating. No 'Help' is offered either, which will deter the complete beginner.

Overall I wasn't too impressed with the atmosphere generated by this game. In spite of the pictures, I couldn't get deeply involved in the game. This problem was enhanced by the unhelpful responses to many commands. At the price, quite good value.

A.W.

Price: £7

Publisher: Interceptor Micros

Address: Lindon House, The Green, Tadley, Hants

C64



Screaming Abdabs

Now here's a rare thing — a game for the Dragon that can compare with the more popular micros. There has been quite a long rest period as software houses size up the market potential for a micro that is cut off from its supplier. Perhaps more people will realise that a software starved user group is worth investing in — witness the second 6809 show.

The game itself might be considered a little unoriginal as you jump onto moving conveyors and run along platforms, take care of melting floors and avoid all the nasty elements. What I thought was particularly good was the ingenuity of the screen design, there are 35 different screens, and the sense of humour employed in creating revolving screws, snipping scissors and other assorted objects to cut you down to size.

It's in black and white using the highest resolution and therefore quite detailed. The animation of the little man is particularly good as he battles his way through.

The title page offers a chance for up to four players and an opportunity to randomise the order of screens. This is a tremendous feature as I usually get stuck on the first screen and consequently get bored trying to see more of what's on offer. Not only do you get a chance to play some of the other screens but a demonstration option goes through all the screens at the beginning should you choose to do so.

Sound was a bit sparse but the colour was not missed at all. Great value for money and an addictively playable game.

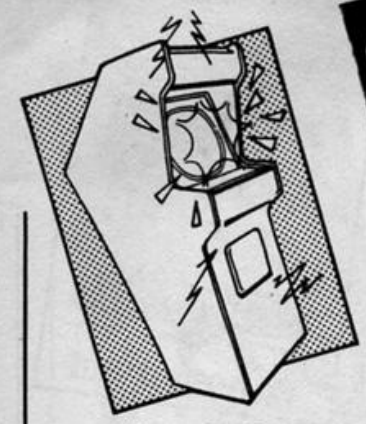
M.P.

Price: £6.90

Publisher: A & F Software

Address: Unit 8, Canal Side Industrial Estate, Woodbine St East, Rochdale, Lancashire OL16 5LB

DRAGON



Penetrator

You don't get any points for guessing that this is a scramble look alike. In fact, this game appeared many moons ago on the Spectrum and has now been converted to the 64.

The scenario is quite standard and involves piloting a space ship/aircraft down a network of tunnels. The floor of the tunnels are littered with radar scanners and guided missiles. These can be bombed or shot for points. Unlike scramble, you don't have to bomb to gain fuel. Additionally, it appears that the longer the Radar scanners are operative, the more accurate the missiles become. There are four stages to the tunnels and you must destroy a neutron bomb cache in the last phase to complete the mission. To help you gain expertise at negotiating the tunnels, there is a training mode which enables you to try any of the four stages with unlimited lives.

The graphics are nicely drawn with jolly mushroom cloud explosions and nicely animated radar screens. A potentially useful option is an editor for customising the landscape. That is, if I could get it to work properly. I can only assume that there was a bug in my copy since the editor wouldn't work as described in the instructions.

Overall I found this game a little easy and rather boring. In spite of the additional features this game is not an improvement on the classic scramble game and Melbourne House is probably about 18 months too late in releasing this game.

A.W.

Price: £6.95

Publisher: Melbourne House

Address: Castle Yard Hse, Castle Yard, Richmond TW10 6TF



C64



Stellar 7

For many moons I have awaited the appearance of a version of that superb arcade game 'Battle Zone'. Here it is, at last. The scenario is simple. You control a tank-like vehicle and must progress via a warp-link to various star systems, destroying the various enemies on the way.

The display gives you the view through the front of your tank. The scenery and opponents are drawn as line shapes. The strength of the game is the 3D effect which is generated as you move. The opposition and other objects change position, shape and size relative to your movement. These changes occur rapidly without any trace of flicker. As the enemy fires at you, even the laser bolts or shells are visible as they head in your direction. Scattered around the area are obstacles and fuel dumps. The latter are useful to replenish your reserves.

When you encounter the warp-link, you can use it to move on to the next planet. You are equipped with shields whose energy is depleted as you are hit and you have an invisible cloak for moments of extreme danger — at great cost in energy.

Everything about this game is professional and slick. The animation is superb with nice transitions between screens. The comprehensive instructions are supplemented by a superb introductory sequence in the program describing the various adversaries. Both keyboard and joystick control are supported.

At the price this program is excellent value and totally enthralling.

A.W.

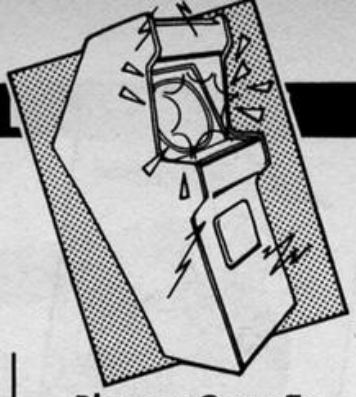
Price: £9.95

Publisher: US Gold

Address: Unit 10, The Parkway Industrial Centre, Heneage St, Birmingham B7 4LY



C64



Blagger Goes To Hollywood

This is another in the Blagger series by Alligata and is just as impressive as its predecessors! The object is to appear in a film. In order to achieve this you must first reach the producer's (a character named Spielbum!) office.

Attempting to stop you in this are a number of well known film characters such as James Bond, Superman, Batman and the Hulk! These may be knocked out by picking up certain props and throwing them at the appropriate character. There is no indication which prop will take out which character although they are connected in some way — for instance Batman is taken out by a 'P-O-W'. Another way to identify which prop to use is that as you enter a character's section the game music changes to a theme from a film — identify the theme and you have the character. Once the characters have all been taken you are allowed into Speilbum's office where you have to do it all over again!

The graphics of the game are very like Zaxxon with a 3D, four way smooth scrolling display. The sound, as I mentioned consists of quite a few tunes and is thus very good, especially the Jaws Theme.

The game is very difficult at first as each time the characters touch you you lose a life and you only have five lives. Control is by joystick and I didn't like this much as Blagger tended to get stuck trying to go through doors and it always happens at the most crucial moment!

The game also features walls that grow and shrink to hinder you, telephone boxes which appear if you spend too long anywhere and also the Tardis which appears to finish you off.

An excellent game and one for every C64 owner! **J.G.D.**

Price: £9.95

Publisher: Aligata

Address: 1 Orange St, Sheffield



C64



★★★★★

Flipped



★★★★

Hooked



★★★

Keen



★★

Yawning



★

Comatose



Raid on Bungleing Bay

This is a sophisticated game for thoughtful shoot-'em-up addicts. You are a helicopter pilot whose mission is to stop the building of a war machine. This machine is being built at six factories located on well defended islands. The dozen or so islands occupy a hundred screens of hi-resolution graphics.

You operate from an aircraft carrier and to help you navigate this vast area there is a radar screen showing the surrounding nine screens. There is also an indicator pointing to the direction of the carrier. You have unlimited missiles but only nine bombs per flight. The joystick gives you very realistic control of the chopper, so after a bit of practice you are up and away.

Although your main concern is locating and bombing the factories you need to attack and destroy the fortifying weaponry. You need to also destroy any radar installations you come across. These help fighter planes locate you. And another thing, bombers attack your carrier so you need to nip back smartish when the warning alert comes.

If by some fluke you manage to eliminate all six factories you are treated to a newspaper account of the raids and a victory parade on the screen. Needless to say I never reached that stage.

This is a good game that allows you to try out different tactics to jack up your score so you one day qualify for the victory parade. The graphics and sound are excellent. Only a price reduction can make it better value for money.

L.C.

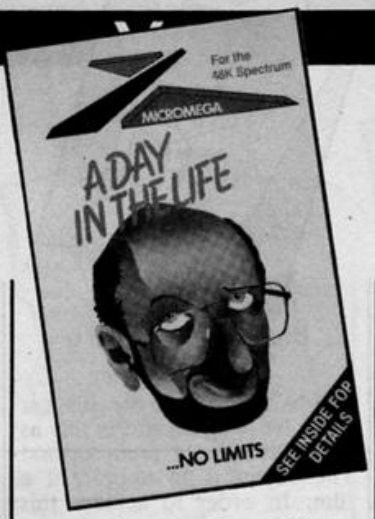
Price: £12.95, disc

Publisher: Ariolasoft

Address: 72 Westfield Ave, London SW13 0AU



C64



A Day In The Life

A day in the life of Uncle Clive is the story line but Micromega never actually mentions this. The game is of the Horace type with large coloured shapes moving freely about the screen. Clive has been made Dame Commander of the British Empire and today's the day when he receives the honour from the palace.

You start in Clive's house and must guide him to get his suit and then a key to let him out. All this must be achieved whilst avoiding cats, bugs and flying television sets! Once outside the game continues in the same vein for the next 20 screens, taking Clive to the railway station, the pub, a wine bar and finally the Palace itself. All the while Clive must pick up certain objects on each screen in order that he may move onto the next one. The graphics, as I mentioned, are large and move very smoothly. Control is by keyboard or joystick and the keys can be redefined if necessary.

Sound consists of an annoying little tune that thankfully can be switched off! The instructions are very clear and funny with repeated references to running a craft show in the Outer Hebrides (cont p94).

Finally the game loads under a special loading system that has blocks, if a block fails to load then the tape may be rewound to the beginning of the block and another attempt made, rather than having to do the whole tape again!

J.G.D.

Price: £6.95

Publisher: Micromega

Address: 230 Lavender Hill, London SW1



SPECTRUM



Nato Commander

In this war game, you play the part of a Nato commander tasked with repelling the invading Warsaw Pact Forces — Russian, East German, Czech, Polish and Hungarian. To perform this task you have access to British, American, West German, Dutch and Belgian forces. All forces are divided into the usual groups such as armour, mechanised infantry, airborne, nuclear units etc.

The actual play is fairly straight forward. You are given a map of Europe showing the development of forces. The map, being larger then the monitor screen, scrolls when necessary. Using a square cursor, you instruct units to move and attack the enemy. The game is played in accelerated real time with the time and data displayed on the screen. Periodic bits of information appear on the screen and can be used to determine your strategy.

Four scenarios are available involving different attack threats and patterns. The final result of the game is a combination of loss of material, positional considerations and political points. Political points vary depending on how the campaign was conducted, whether conventional, chemical or nuclear weapons were used.

The use of graphics and sound are effective and the gmae played smoothly with no significant bugs, although there were some aspects which didn't perform as described in the instructions. On the whole this is a tough game which takes effort to master and will probably appeal to the enthusiast. At the price the game is a little expensive but is still reasonable value for money.

A.W.

price: £9.99

publisher: US Gold

address: 10 The Parkway Ind Est, Heneage St, Birmingham B7 4LY



C64



Gogo the Ghost

Gogo the Ghost is love sick. Some evil ghoul has imprisoned his beloved princess in the castle. Your task is simple: guide Gogo to the princess so they can both live happily ever after. The cassette inlay informs you that she is locked in room 150, so I would take a packed lunch as you could be in the castle for quite a while.

Each room Gogo enters has a number, and some also have names. At the start you are asked for a password, and entering a room name enables you to commence from that point.

Upon entering a new room Gogo acquires sufficient power to allow him to become invisible for a few seconds. This enables him to pass through any of the phantoms which guard each room. Gogo is made invisible by pressing the joystick fire button. However, pressing the button a fraction too soon causes Gogo to reappear in mid phantom and "FJUP!" no more Gogo. According to Firebird, "FJUP!" is Swedish for "ZAP!" — who says games aren't educational.

Apart from the phantoms you will also find a variety of useful objects scattered around the rooms. Their purpose isn't known until Gogo picks them up. At this point one of six symbols at the base of the screen will be illuminated. The symbols represent life, power, time, and differing numbers of bonus points.

The graphics are nothing spectacular but this didn't detract from the playability of the game. At a cost of £2.50 the game represents excellent value for money.

J.R.

Price: 2.50

Publisher: Firebird

Address: Wellington House, Upper St Martins Lane, London WC2H 9DL



C64



Bridge Player 2

A bridge player I am not — but, with many more hours using this program and I shall be asking for tuition — or perhaps CP Software already publishes a Basic Course in Bridge? This is a well designed and well-organised program with many options available to the experienced player wishing to sharpen his skills on his own.

You are offered a series of five options for instance: "computer deals", "you deal", "play the cards from all four hands" or "let the computer play the defender's cards". Then, after a short shuffle, the computer deals the cards, either showing four hands or two, on a green cloth, or just your hand, large at screen top while you make your bid.

Screen shows number of hand, dealer, and contract at top left with score bottom left, last trick shown bottom right — winner flashing — the card-table shows cards in centre and N, E, S and W hands around that. Quite realistic and easy to follow.

Bidding is in accordance with the Alcol system — though an expert friend says it makes unrealistic bids when the computer takes partners.

The program offers: post-mortem facility with rebidding and/or replaying of any hand; full scoring, both of the result and cumulatively; the ability to input selected hands, review bids, see the play to the earlier tricks, peep at the opponents' hands and at any time to go on to the next hand or to return to the option list.

Must stop now — it's my turn. **T.W.**

Price: £9.95

Publisher: CP Software

Address: 2 Glebe Road, Uxbridge, Middlesex

SPECTRUM



Sleuth

Sleuth is an extremely clever and useful BASIC debugging tool which has dual screen and single stepping modes. However, its wide range of commands and facilities mean its not easy to 'drive' but once the operating sequence has been learnt one begins to appreciate its value for developing new, or debugging old, programs. This complexity means that a short review cannot do justice to its full potential, however, here goes.

Sleuth is similar to a machine code monitor program and can be entered before or after loading a program. Fewer problems will be experienced if the ROM is entered first. Then a program can be loaded, saved or listed.

The control screen has a very clear display which shows status, current line being executed, current procedure, values of variables in current statement, values of user selected variables and a space at the bottom of the screen, set aside for command entries. Each statement in the current line is highlighted as it is executed and the variables are continuously updated as the program runs.

The speed of program execution under Sleuth's control can be varied from one to 100 statements per second and may be frozen at any point, which when combined with dual screen mode enables the user to analyse the effect of each statement on the screen display.

Conditional and unconditional breakpoints can be set so that the program will stop running on reaching a pre-defined line number. Similarly, variable breakpoints can be set so that the program will halt when a chosen value is reached. Conditional breakpoints must not contain a BASIC keyword. For example A%) =(33*score %+B)*3^2 is acceptable, but A=SIN(X) is not. All breakpoints may be temporarily disabled and can be displayed on the control screen.

Whilst the program is running Sleuth allows the user to halt the execution of the program and change the value of any variable so as to see its effects upon the screen display.

It will allow a program to be run from any line number or can be made to jump a section by a GOTO statement. In addition, a multistep command can be used to avoid the problems of single stepping through long time delays.

The control screen also shows the nesting levels of FOR loops, GOSUBs, REPEATs and PROCs, which can be useful for checking that loops are properly exited.

The package includes a comprehensive instruction manual and it pays to read this very carefully before using Sleuth. I wasted an hour trying, unsuccessfully, to enter dual screen mode before finding out that one has to enter this mode before loading a program. **J.D.**

Price: £29

Publisher: Beebugsoft

Address: PO Box 50, St Albans, Herts

BBC



Premier League

This is a football management simulation written in just under 42K of BASIC. In it, you are the manager of a Division 1 team, and have to work your way up to the top, or face relegation. You can equally be sacked for financial mismanagement.

At the beginning of the session, you can give your team a name, then examine the squad. For each member, all well known named footballers, you are given position of play, skill rating and current form. At the same time, you may view the squads of all the other teams in the league. The same information is given, but the players are numbered not named. This becomes important when you come to buy or sell a player later, an interesting bargaining process.

From your full squad of 15, you choose who is to play, and who will sub. You may also choose to have training sessions. These may be very successful, in which case your players' skill improves, or may result in injury. When all this is done, it's off to the match!

The screen clears to show a football field from above, and at various points in the match opportunity is given to play your sub. Names of scoring players are given. The final result is incorporated in the league table.

If this all sounds like Addictive's Football Manager, it is! The difference is that it's slower, cheaper, and doesn't feature the match highlights. Not as good in my opinion. **D.M.**

price: £4.75

publisher: E & J Software

address: 59, Stainton Rd, Enfield, Middlesex

SPECTRUM

REVIEWS



Quasimodo

I have my doubts about the use of an individual with such a spinal deformity as the central character in such a game, despite the slender association with the historic resident of Notre Dame.

This game claims to be arcade style, which in essence means that it has the look of the arcade game but not the speed, and that can often be a telling factor in its popularity. For all that, it still manages to provide a challenge to the younger user.

The opening screen allows a choice of either joystick or keyboard control, and the facility to practice any of the 20 screens until you feel confident enough to go ahead. In essence this is, I suppose, a Kong derivative, where Quasimodo must reach a bell and ring it, coping with castle guards, arrows, fireballs, and kestrels. Yes, kestrels. The ultimate goal is the rescue of Esmerelda, who just happens to look like a fella in this implementation. If he manages to toll the bell in each of the 20 screens, a special feature comes into play — I never found out what this might be.

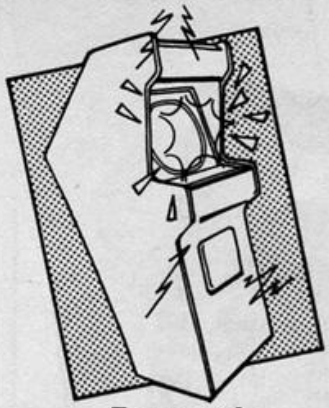
If Quasi is still crouching around when the displayed bonus score has counted down to zero he loses one of his four lives regardless. The practice of screens is therefore virtually a necessity.

The graphics are quite good, but the keyboard response leaves a lot to be desired. Documentation is fairly good, and the robust packaging as usual shows a graphic quality which is clearly impossible on the 4A.

This needs Extended BASIC and has a joystick option. **P.B.**

Price: £7.95
Publisher: Intrigue Software
Address: Cranbrook Rd, Tenterden, Kent TN30 6UJ

TI99



Tempest

One of the more mundane aspects of a space pilot's life is stargate duty.

You're sat in your ship, the Claw, leisurely moving around the rim of the stargate keeping a wary eye for unwelcome visitors. Occasionally however, things get a little more hectic when a squadron of aliens tries a little stargate crashing. Tempest from Superior is based around one of these occasions.

The stargate is a wire frame construction drawn in perspective down into the screen. The exact shape of the structure varies from level to level. Perched, precariously, on the rim of the gate you are attacked by ever increasing numbers of assorted aliens. These make their way slowly up the gate, increasing in size as they approach. Using your left and right rotate controls you flip around the rim of the gate firing your lasers down on to the enemy. A more effective way of vaporising the aliens is to use your super zapper, but you are only allowed one such zap per screen.

There are a multitude of different meanies, some split into two when hit, some leave a nasty green spike in their wake. These spikes must be avoided at all costs when your claw is catapulted down the stargate at the end of each successully cleared screen.

Having played Tempest in the arcades on several occasions, I was slightly disappointed to find that the Beeb version was written using Mode 5, but once I got accustomed to the low resolution screen the game was just as exhilerating as the original. **J.R.**

price: £9.95

publisher: Superior Software

address: Ground Floor, Regent Hse, Skinner Lane, Leeds 7

BBC



Tiler

Interceptor has a reputation for excellent games. Could this brilliance transfer to the Spectrum, I wondered? In Tiler, you are an Acme contracted engineer who must tile the roof of Rob Rubber's house. This involves crossing three screens to collect a key, then a tile, then laying it, whilst avoiding rob himself, who bounces around in deadly fashion.

Unfortunately, the Interceptor magic has not worked on the Spectrum. The game lacks professionalism. Although the background graphics are well drawn and colourful, both the animated characters are jerky and unattractive. Sound is average, as are the instructions. The high score table is frustrating to use.

If the description at the top sounded like a platform game, I misled you. Very little skill is needed, and with only one possible way of dying, there is nothing to avoid. Movement between the small number of floors is by one way ladders; attempting to move the wrong way causes your man to stand paralysed. He probably realises how boring this game is.

The small number of screens only adds to the game's basic fault: it is extremely tedious. The roof needs a lot of tiles, but the task does not change at all — every time you have to follow the same, long-winded routine. Quite how Interceptor expects people to like this, I have no idea.

There are many, much better games for your Spectrum, some at half the price. Let's see some conversions of Commodore games instead, Interceptor. **P.S.**

Price: £5.50
Publisher: Interceptor
Address: Lindon House, The Green, Tadley, Hants, England

SPECTRUM



Mini Office

Four programs for less than the price of one!

To prove the point that prices sell programs, this classic business package has succeeded in relegating several chart-topping games programs down a peg or two.

Now the home enthusiast has the ability to bespoke his or her own personal database and spreadsheet — project the data to a sophisticated graphics package and communicate using a rudimentary word-processor.

Doubtless the database will be well thumbed. Its capacity to keep records of varying lengths and complexities with near instant recall is phenomenal, if only as the oft suggested personal telephone directory, or perhaps more usefully a magazine review index.

Ideal for keeping tabs on financial transactions, the spreadsheet reveals all. Time spent tailoring it to fit your own needs is well rewarded. Almost any analysis of income or expenditure, be it personal, private or business can be output to the screen or printer.

The annual tot up should prove enlightening. Comparison of the monies spent on computer magazines and bread for instance, emphasising the correctness of your priorities!

The graphics package is primed with data generated by the spreadsheet. Here a pictorial representation of the figures is produced as a 3D bar chart, a pie chart or a simple line graph.

Lacking the neatness of right justification was a disappointment. On the credit side was a word counter displayed at the top of the screen, along with the number of words per minute being typed in edit mode.

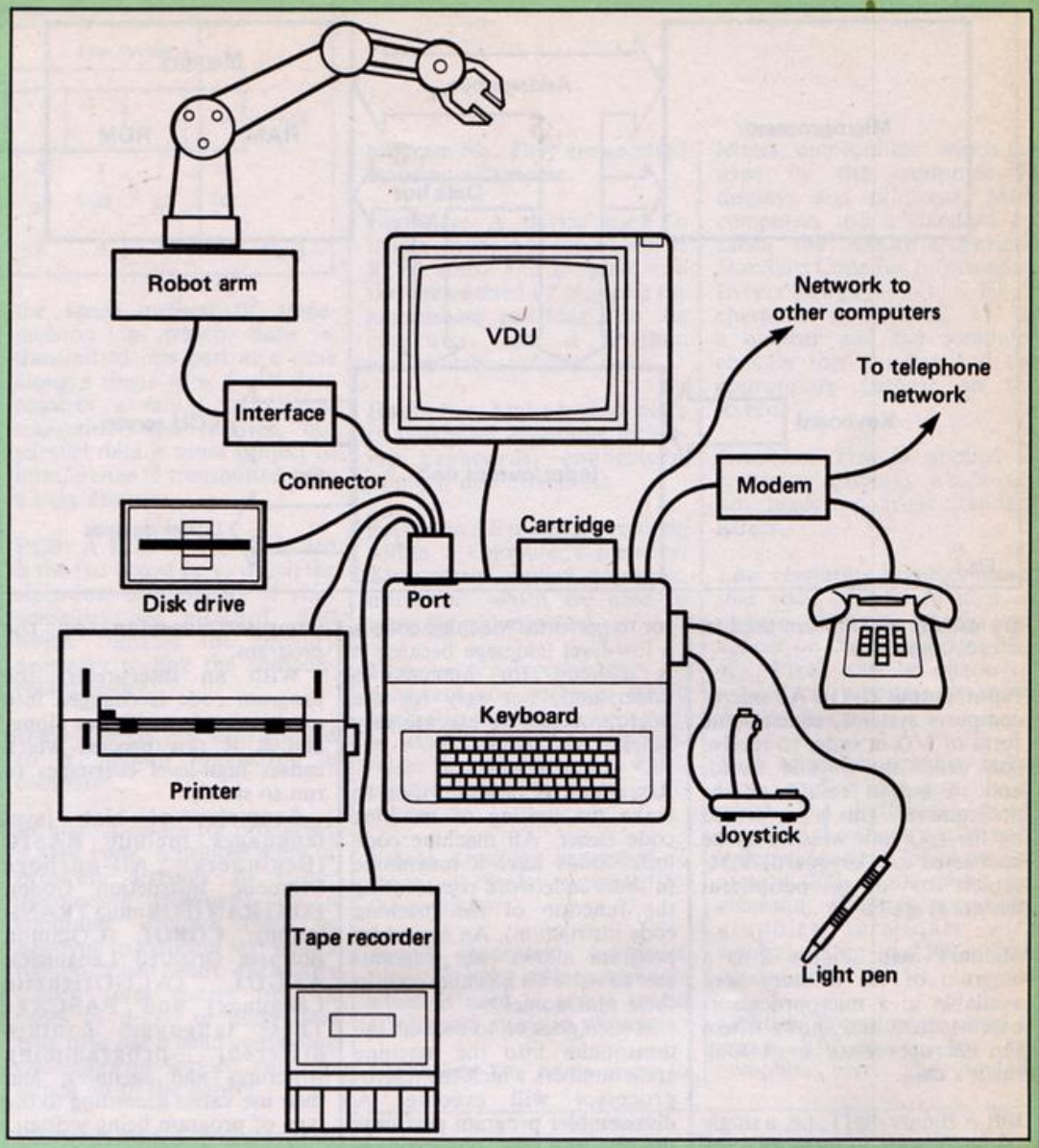
Maximise your computer with this mini office. **D.H.**

Price: 5.95
Publisher: Database
Address: 68, Chester Rd, Hazel Grove, Stockport

AMSTRAD

TEACH YOURSELF JARGON

In this pull out and keep jargon guide Iain Murray guides you through the maze of computer terms and jargon



This list covers most of the common buzzwords, and is not alphabetic, but thematic, beginning with the internal workings of the computer, through software terms to computer systems and applications.

Microprocessor: This is the brain of a microcomputer, a single integrated circuit chip which contains all the circuitry necessary to perform the logical arithmetic and 'housekeeping' functions necessary in a computer. A microprocessor can only move numbers around in it's memory, add two numbers, and compare two numbers. However, when such instructions are grouped together to form a **program**, the simple instructions combine to give the microprocessor an apparent degree of 'intelligence'.

Generally, a microprocessor can perform these functions very quickly, often more than a million in one second. The speed of the microprocessor is governed by a **clock** circuit which provides a 'heartbeat' for timing the operations within the computer.

The microprocessor communicates to other devices within the computer along a **bus** which is a collection of wires along which data can pass. Usually two buses are used, an **address** bus which carries the memory location which the microprocessor is looking at, and a **data** bus which carries the information being read into or out of the microprocessor.

Random access memory (RAM): The name given to memory which can be written to by the computer, where programs and data are stored. **RAM** can be randomly accessed, i.e. data can be input and output to anywhere in the memory at any time, and it does not need to be read as a continuous series of data. RAM is volatile which means that the contents of the memory are lost when the power is switched off.

Read only memory (ROM): A type of memory which is also randomly accessible, but unlike **RAM** it cannot be modified by the computer, only read from. The contents of this memory device are placed there when the integrated circuit is manufactured, and generally contain data necesary to the working of the comuter.

In home computers, **ROMs** usually hold the BASIC language, character sets and operating systems. Some types of **ROM** can be programmed and reprogrammed by the user, but special equipment is required to perform this **blowing** of **ROMs**. Chips available include programmable **ROMs** (**PROMs**), Erasable Progammable **ROMs** (**EPROMs**) and Electrically Alterable **ROMs** (**EAROMs**), but **RAM** and normal **ROMs**

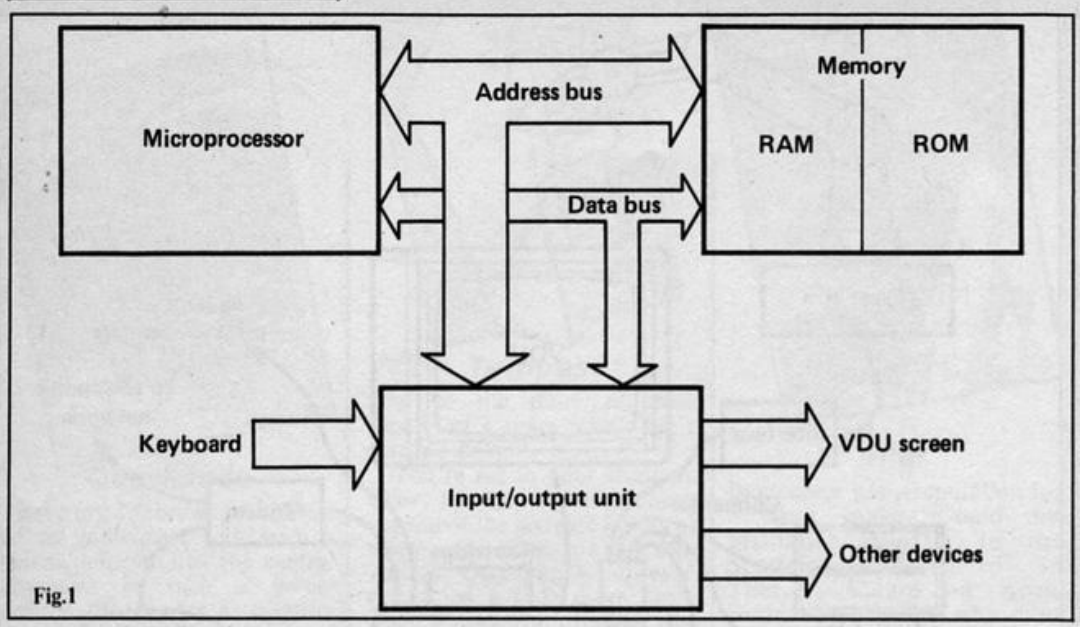


Fig.1

are usually all that are used in microcomputers.

Input/output (I/O): All microcomputer systems require some form of **I/O** in order to receive data from the outside world, and to output results to the programmer. This is performed by the **I/O** unit which may be connected to a keyboard, **VDU** screen or other peripheral devices (Fig. 1).

Memory map: Figure 2 is a diagram of the memory area available in a microprocessor-based system and shows where the microprocessor must look for it's data.

Bit: A Binary digIT, i.e. a single '1' or '0' state in memory.

Byte: Eight **Bits**, each being differently **weighted** so that a byte can hold a value of up to 255 (decimal). The Least Significant Bit (**LSB**) has a weighting of one, the next bit a weighting of two, then four, eight, etc. up to the Most Significant Bit (**MSB**) which has a weighting of 128 (Fig. 3).

In eight-bit microcomuters, memory is arranged in bytes, with 16, 48, 64 etc. kilobytes (**K**) of memory available, 1K being equal to 1024 bytes.

Memory bytes can hold data, instructions, characters etc., and may be joined together to form **words** of 16, 32 etc. bits, or may be split up into their individual component bits or **nybbles** (four bits).

Machine code: The native language of the microprocessor, comprising a series of numbers stored in memory which form a chain of instructions and operands for the microprocessor to perform. Machine code is a low-level language because it is difficult for humans to understand, but easy for the microprocessor to execute very quickly.

Assembler: A program used to make the writing of machine code easier. All machine code instructions have a **mnemonic** (a short code word representing the function of the machine code instruction). An assembler program allows the programmer to write his machine code in these mnemonics.

It then goes on to convert the mnemonics into the machine code numbers which the microprocessor will execute. A **disassembler** program performs the opposite task, converting a machine code program into a list of mnemonics.

High-level language: An English-type language which makes programming easier for humans. It contains words and structures which make the program's function more easily understood. However, before the program can be executed, it must be turned into machine code for the microprocessor to execute, and this is a slow process.

This can be done as the program is being executed (at **run time**), using an **interpreter** program (this is the usual method on home computers), or can be done beforehand using a **compiler** program.

Compilers create a new version of the program in machine code, which can be executed directly at run time, the speed of the new version being dependent upon the efficiency of the compiler. It is usually faster than the non-compiled version of the program.

With an interpreter, the program code is changed into machine code as it goes along, and it is this process which causes high-level languages to run so slowly.

Examples of high level languages include **BASIC** (Beginners All-purpose Symbolic Instruction Code), **FORTRAN** (FORmula TRANslation), **COBOL** (COmmon Business Oriented Language), **ALGOL** (ALGOrithmic Language) and **PASCAL**. These languages contain different programming structures and facilities, and their use varies according to the type of program being written.

Structured programming: Effectively a 'clean' form of a high-level language program, with the program broken down into easily understandable 'modules' of code containing the program's constituent functions and **algorithms** (program sections defining a particular operation). This avoids too many program jumps which can lead to a very confusing program when you look at it later.

Variables: High-level languages allow you to assign names to the numbers (variables) you are using in your program, which makes manipulation of the numbers much easier.

Variables are usually one of four types: **real** variables contain numbers with decimal parts, i.e. not necessarily whole numbers. **Integer** variables contain whole numbers, i.e. numbers with no digits after the decimal point. **String** variables are used to hold lists of text characters or words, and to manipulate these words.

Arrays are special variables, consisting of a table of variables (real, integer or string) all with the same name, but each subscripted with a different number. When used in program **loops** (program sections repeated over and over), array variables become very useful. They may be constructed with more than one dimension (i.e. more than one identification number).

Bug: This is a common expression used to describe a fault in a program, or a bit of software which does not perform as expected. If a fault is particularly bad, it may cause the computer to **crash** which means that it either locks up and you cannot regain control of it, or it automatically resets itself and your program is lost.

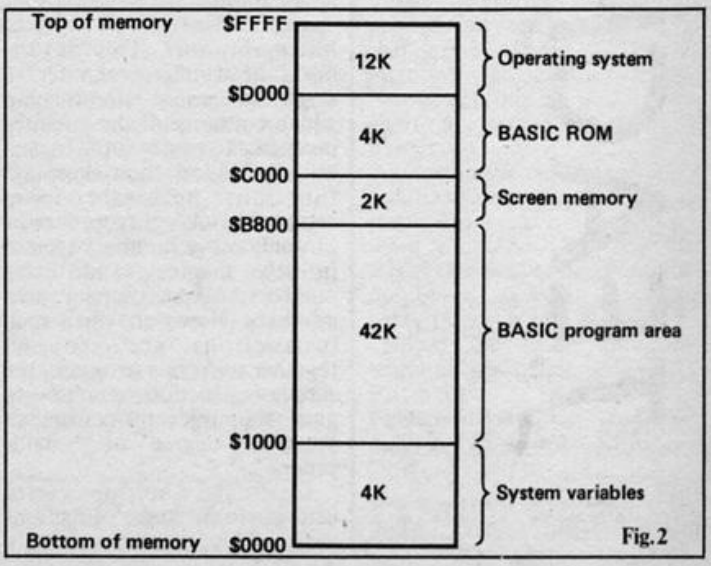


Fig.2

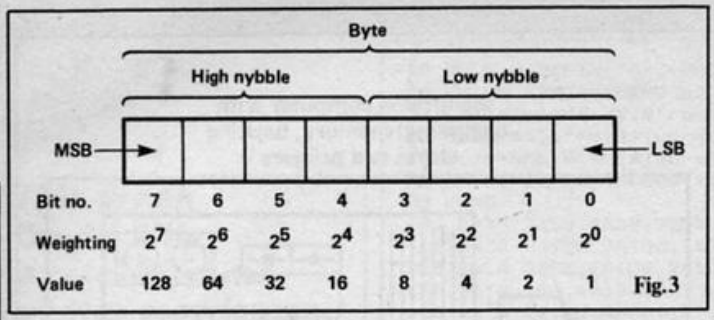


Fig.3

Faults in the machine or the program which cause the computer to crash irretrievably, or to lose it's memory are said to be **fatal**. If an error occurs only very occasionally, it may be due to a little used routine being faulty, or due to some outside influence on the computer, such as cosmic rays and mains voltage spikes. These random faults are said to be **soft errors.**

Digital: Indicates data storage/transmission by way of a series of 'on' or 'off' states in a circuit.

Analogue: Indicates data storage/transmission by the size of a current or voltage in a circuit.

Binary: A number system comprising only the numbers 0 and 1 (high and low states). Binary numbers are to a BASE of 2 (decimal numbers are to the base 10). Binary arithmetic is used by digital computers because a BIT can only hold the numbers 0 and 1.

Binary: A number system comprising only the numbers 0 and 1 (high and low states). Binary numbers are to a BASE of 2 (decimal numbers are to the base 10). Binary arithmetic is used by digital computers because a BIT can only hold the numbers 0 and 1.

Octal: A number system comprising only the numbers 0 to 7, i.e. to the base 8. This system is sometimes used for convenience by machine code programmers.

Hexadecimal: A number system comprising the numbers 0 to 15, i.e. to the base 16. Numbers 10 to 15 are represented by the letters A to F respectively. This system is often used by machine code programmers for convenience. Hex numbers are denoted by a preceding $ sign or a letter H after the number.

Parallel: A method of data transmission. Several bits of a digital signal are being passed simultaneously along a number of individual wires. It requires more wires, but is faster than the **serial** method of transmission in which data is transmitted one part at a time along a single wire. Serial data requires a more complicated transmitter and receiver, but parallel data is more subject to interference if transmitted over a long distance.

PCB: A Printed Circuit Board is the flat board on to which the electronic components of your computer are attached, and which contains the circuitry necessary to link the components together.

User: The general term applied to a person operating a computer.

Printer: A device for producing a **hard copy**, a printed copy of program listings or other documents produced by a computer. Printers might be **pen-type** (producing text with a ball-point pen head), **dot matrix** (which form letters from a series of dots), or **daisywheel type** (this has a head containing characters pre-formed, ready to punch on to the paper).

Plotter: This is a special type of printer, operating on a flat sheet of paper, used to produce large graphic displays with a moving pen.

Floppy disc: A magnetic disc like a gramophone record which can be written on to or read from by a computer using a **disc drive**, enabling programs and data to be stored permanently for retrieval later.

Data is stored in random access format, enabling it to be retreived quickly. **Hard discs** are not usually interchangeable, although they can store much more data than a floppy disc.

Magnetic tape: Tape on to which data and programs can be stored in a serial fashion, making data retrieval slower and more difficult than with a disc system. For home use these are usually tape cassettes.

File: A block of data stored on disc or tape. This can be numbers or strings stored to be read by a computer, or a program file. They are accessed by using a **filename.**

Cartridge: A device used to hold a program in some form of ROM chip. The program can then be selected by plugging the appropriate cartridge into the computer, and it is then immediately ready for use.

Hardware: Any physical piece of computer apparatus including keyboards, connectors, printers, disc drives, etc.

Software: All programs running within a computer's memory. Also often applied to tapes, discs, etc. which are used to store the programs on.

Firmware: A combination of hardware and software which applies to memory devices such as ROMs, EPROMs and cartridges (i.e. hardware) but which contain programs (i.e. software).

Video: Anything connected to the visual display generated by the computer.

Sound generator: A device fitted to some microcomputers which is used to create sound effects and music in programs.

Character: The name given to letters, numbers etc. which are used by the computer in displays and printouts. Most computers use a standard set called the **ASCII** (American Standard Code for Information Interchange) set. Each character is referred to by a number and the computer changes this number into the appropriate pattern on the screen.

Graphics: This is applied to computer displays which are not made up from standard letters.

Low resolution graphics means that only a small number of picture elements (**pixels**) can appear on the screen (e.g. 25 x 40). Pixels can be characters — letters, numbers or other defined blocks.

High resolution graphics is the term applied to displays in which the individual pixels (dots) on the screen can be used independently. Displays of around 200 x 400 pixels are common, although specialised graphics terminals with resolutions up to 1500 x 2000 pixels exist.

Utilities: Programs designed to make life easier for the computer user. They include

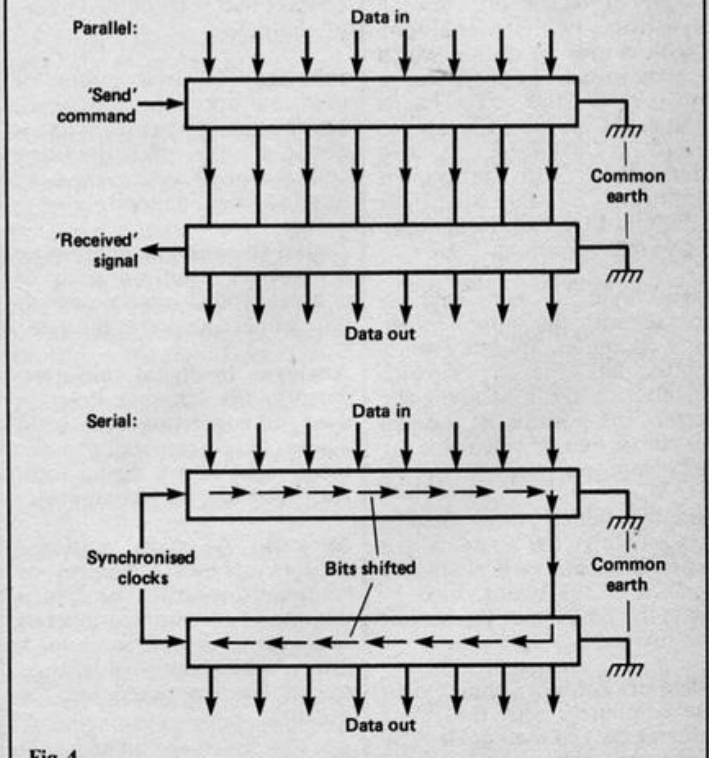


Fig.4

WORDS

programmer's aids such as graphics packages and machine code tools.

Mainframe computer: The term applied to large multi-user computers with large memories and vast computing power. These are very expensive and are generally only used in factories and other establishments where a lot of computing power is needed by a large number (10-100) of people simultaneously.

Minicomputer: A large and fast computer, supporting perhaps five users simultaneously. They are used where a lot of computing power is needed by one system, such as real-time simulation of a complex electronics system.

Microcomputer: A small desk-top computer for one user, with limited computing power and memory.

Keyboard: The panel of labelled buttons connected to a computer which allows the user to communcate with it. Keys are the most common type of input device.

Joystick: A stick, simular to that used in some aircraft, used to give a simple form of direction controls to a computer. **Digital joysticks** give a signal of 'on' or 'off' for each direction, whilst **analogue joysticks** give an output which is proportional to the position of the joystick. **Trackballs** consist of a sphere, part of which is moveable in two dimensions, with movement controlled by the speed of rotation of the ball, rather than it's current position.

Light Pen: A pen held in contact with the output screen of a computer, by synchronising the data from the pen with the electron beam scanning the screen, the position of the pen on the screen is calculable by the computer.

Graphics tablet: A pen, held in contact with a flat board, with a series of contacts beneath the surface of the board, used to sense the position of the pen on the surface.

Digitiser: An arm connected to the computer, with the joints relaying data of their angle. The computer can calculate the position of the end of the arm. Graphics tablets and digitisers are used to input a picture into a computer quickly and simply.

VDU: A Visual Display Unit is the screen on which a computer gives it's video output. This can be a **monitor**, which is fed directly from the computer or, by putting the video signal through a **UHF modulator**, it can be connected to an ordinary TV set.

Terminal: The name given to a single unit comprising a keyboard and a VDU, particularly when connected to a mainframe or minicomputer.

Peripheral: A device which is not actually part of the computer itself, such as printers, disc drives, tape drives and VDUs.

Backing store: A non-volatile device used to store programs and data for later retrieval. Examples include disc drives and tape recorders.

Port: The plug or slot on the outside of a computer which is used to connect it to peripherals and other external hardware for input and output of information.

Connector: The plug/socket/cable combination used to connect two ports on two pieces of equipment.

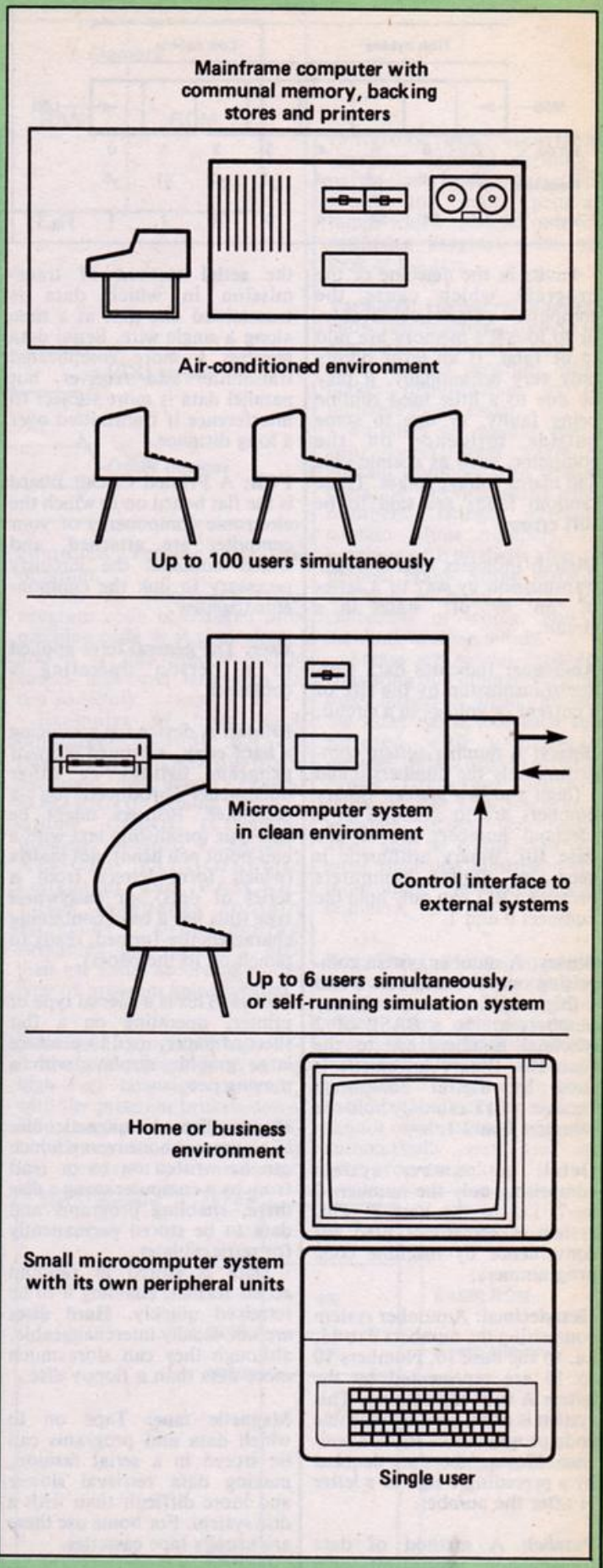
Interface: If two pieces of hardware are to be connected, but the data output from one is not in a form which the other will accept directly, then an interface must be used.

Digital to analogue converters: A type of interface used to convert coded digital signals into a linear analogue output.

Analogue to digital converters perform the opposite function used in converting real-world values (e.g. temperature, distance, etc.) into a digital form for processing by a computer.

Network: A special interface used to connect a number of computers together, and to a number of common peripherals such as a disc drive and a printer which can then be used by all the computers on the network.

Modems: Used to connect computers to each other by way of the telephone system. They contain the necessary circuitry to code and decode the computer data for transmission on the telephone network.



HOW TO DRAW

This week David Ellis explains some of the words used for graphics on the Amstrad CPC464

```
10 MODE 0:DEFINT A-Z:ORIGIN 190,390:PAPER 6:BORDER 3,11
20 WHILE TIME>0:READ word$:IF word$="end" THEN 5000
30 L=LEN(word$)-2:direction=VAL(LEFT$(word$,1))
50 color$="&"+MID$(word$,2,1):color=VAL(color$)
60 size=VAL(RIGHT$(word$,1))
70 ON direction GOSUB 1000,2000,3000,4000
80 WEND
100 DATA 2350,4A50,2B50,3D50,2350,4A150,1B50,3D50,1350,4A50,1B50,3D150,10170
110 DATA 23150,4A150,1B150,3D60,2350,4A10,2B50,3D50,1350,4A10,1B50,3D60,10170
120 DATA 2350,4A100,2B15,3D50,2320,4A50,2B15,3D100,2350,4A150,1B150,3D150
130 DATA 104,40190,20290,2135,42100,1335,37100,10115
140 DATA 21100,4260,1370,4720,2170,4220,13100,3760,2170,3220,1370,3720,104
150 DATA 40152,20150,2E30,3F15,1E30,4F15,406,4E15,2F30,3E15,1F30,108,3028
160 DATA 2E45,4F50,1E50,3F22,2E9,3F6,1E4,3F22,1070
170 DATA 2F50,4E50,1F50,3E8,2F42,3E13,1F33,3E8,2F33,3E13,1F42,3E8
180 DATA 1065,2F50,4E30,1F42,4E12,2F42,4E8,1F50,3E30,2F42,3E12,1F42,3E8
190 DATA 1060,2F50,4E8,1F21,4E42,1F8,3E42,1F21,3E8,"end"
1000 |RIGHT,size,color:RETURN
2000 |LEFT,size,color:RETURN
3000 |UP,size,color:RETURN
4000 |DOWN,size,color:RETURN
5000 count=1:col=INT(RND*15):COL2=INT(RND*15)
5010 BORDER COL,COL2
5020 |WAIT,20:INK 3,6:INK 10,14:INK 11,16:INK 13,22:INK 0,COL
5030 |WAIT,20:INK 3,22:INK 10,6:INK 11,14:INK 13,16:INK 0,COL2
5040 |WAIT,20:INK 3,16:INK 10,22:INK 11, 6:INK 13,14:INK 0,COL
5050 |WAIT,20:INK 3,14: INK 10,16:INK 11,22:INK 13,6:INK 0,COL2
5060 count=count+1:IF count=10 THEN 5000 ELSE 5020
```



To simplify the operation of drawing lines on the Amstrad screen the new words RIGHT, LEFT, UP, and DOWN will be added to the RSX. The following jumpblock routines are used:

2 GRA SET PEN (&BBDE) This routine sets the PEN colour of the line to be drawn. The PEN value is passed, via the accumulator, to the routine. The value in the accumulator is 'masked' so that it's range is correct for the current mode, i.e.

MODE 0 value 0 to 15
MODE 1 value 0 to 3
MODE 2 value 0 to 1

2 GRA LINE RELATIVE (&BBF9) This will draw a line relative to the current graphics cursor. The cursor position is updated accordingly. If the point specified lies outside the graphic window then it will be ignored. On entry to the subroutine the DE register must contain the horizontal (X) offset, and the HL register the vertical (Y) offset.

All that is required is to set the colour for plotting, and set the required X and Y offset. The four machine code routines are shown in listings 1 and 2. The following points may be of interest:

The subroutine to set the plotting colour (if specified) is located from &838C to &8397. The colour will only be set if two parameters are passed with the word. All four words branch to this subroutine first. The subroutine from &8374 to &838B is a common one used by both DOWN and LEFT.

Occasionally, when the PARAMETER routine is called, the offset value will be in the wrong register. With the word RIGHT, the offset is in HL when it needs to be in DE. There are no opcodes on the Z80 to transfer values from register pairs. It would be nice if you could say:

LD DE,HL ; Load DE register with the contents of HL register.

Unfortunately this is not possible directly, so two methods can be used. For the word RIGHT I have used:

```
LD D,H    transfer the contents
LD E,L      of HL to DE
```

However, for the word UP, I have used the other method:

```
PUSH DE     transfer contents
POP HL        of DE to HL
```

Now, both these methods work admirably. The latter method is probably used more often, but the former method is the most efficient — why?

LD D,H takes 4 u seconds @ 1MHZ
LD E,L takes 4 u seconds @ 1MHZ
Total = 8 u seconds @ 1MHZ

PUSH DE takes 13 u seconds @ 1MHZ
POP HL takes 10 u seconds @ 1MHZ
Total = 23 u seconds @ 1MHZ

As you can see, a straight exchange of two single registers takes only one-third of the PUSH/POP method. The quickest method is always to be preferred!

You may think that at &8384/5 I could have used LD B,H and LD C,L but you would be wrong. The DE register is PUSHed at &837E and then a branch is taken to &8385... POP BC. If you had replaced this with LD C,l then the stack would be different on return to BASIC. In fact, as the stack is different it is unlikely that you would return to BASIC at all!

As for the words themselves, they all have the same syntax:

|WORD , number of pixels (, colour)

WORD refers to RIGHT, LEFT, UP or DOWN. The number of pixels is the length of the line to be drawn. For angled lines the normal DRAWR or DRAW commands can be used. Instead of using MOVER you could use one of the four words and draw the line in the same colour as the background — i.e. invisible.

If you are drawing many lines it will be better to hold the data in DATA statements as follows. Each movement can be expressed in five bytes:

BYTE 1 — RIGHT = 1 LEFT = 2 UP = 3 DOWN = 4
BYTE 2 — COLOUR 0 to F (expressed in hexadecimal), corresponds to PEN no.
BYTES 3 to 5 — Length of line 1 to 640

The four commands to draw a square would be:

|RIGHT,100,3
|UP,100



|LEFT,100
|DOWN,100

If held in DATA statements they would take the form:

DATA 13100,33100,23100,43100

This would draw a RED square. Listing 3 is a BASIC program which uses this method to draw an item. Type the program out if you want to see what it is. Remember to add the four new words to the RSX first though!

Next week we will add a word to draw squares and rectangles, and also a word to fill these 'boxes' in with colour.

Listing 2. Machine code listing for down and left

Down

Address	Mnemonic	Op Codes	Comment
&835E	CALL &8374	CD 74 83	; subroutine common to DOWN & UP
&8361	LD DE,Ø	11 Ø Ø	; DE = horizontal movement (Ø)
&8364	CALL &BBF9	CD F9 BB	; subroutine to draw a line
&8367	RET	C9	; done

Left

&8368	CALL &8374	CD 74 83	; subroutine common to DOWN & UP
&836B	LD D,H	54	; transfer contents of
&836C	LD E,L	5D	; HL to DE
&836D	LD HL,Ø	21 Ø Ø	; HL = vertical movement (Ø
&8370	CALL &BBF9	CD F9 BB	; subroutine to draw a line
&8373	RET	C9	; done
&8374	CALL &838C	CD 8C 83	; subroutine to set plotting colour
&8377	CP 2	FE 2	; Are there 2 parameters?
&8379	JR NZ &8381	20 6	; If not, skip the next bit
&837B	CALL 8295	CD 95 82	; HL = colour. DE = no. of pixels
&837E	PUSH DE	D5	; save no. of pixels and
&837F	JR &8385	18 4	; skip the next bit
&8381	CALL &829B	CD 9B 82	; HL = no. of pixels
&8384	PUSH HL	E5	; number of pixels to stack
&8385	POP BC	C1	; BC = no. of pixels
&8386	LD HL,Ø	21 Ø Ø	; zero HL register
&8389	SBC HL,BC	ED 42	; subtract BC from HL
&838B	RET	C9	; return to main subroutine
&838C	CP 1	FE 1	; is there only 1 parameter?
&838E	RET Z	C8	; if so, no colour needed
&838F	PUSH AF	F5	; save number of parameters
&8390	LD A,(IX+Ø)	DD 7E Ø	; colour parameter to accumulator
&8393	CALL &BBDE	CD DE BB	; subroutine to set plotting colour
&8396	POP AF	F1	; restore number of parameters
&8397	RET	C9	; return to main subroutine

FLOWERS OF CRYSTAL

Two part adventure, introductory dramatised audio story, work sheet, utility, map, superbly-illustrated story booklet, teacher's manual.

Flowers of Crystal, our No. 1 of 1984, was judged to be certainly original, very well presented, marvellously adaptable and unique in its scope.

Educational Computing Jan. '85

TELE-BOOK

An extremely flexible menu-driven program which allows 'books' of up to 15 pages of text and graphics to be created on the BBC B micro. Ideal for primary school use.

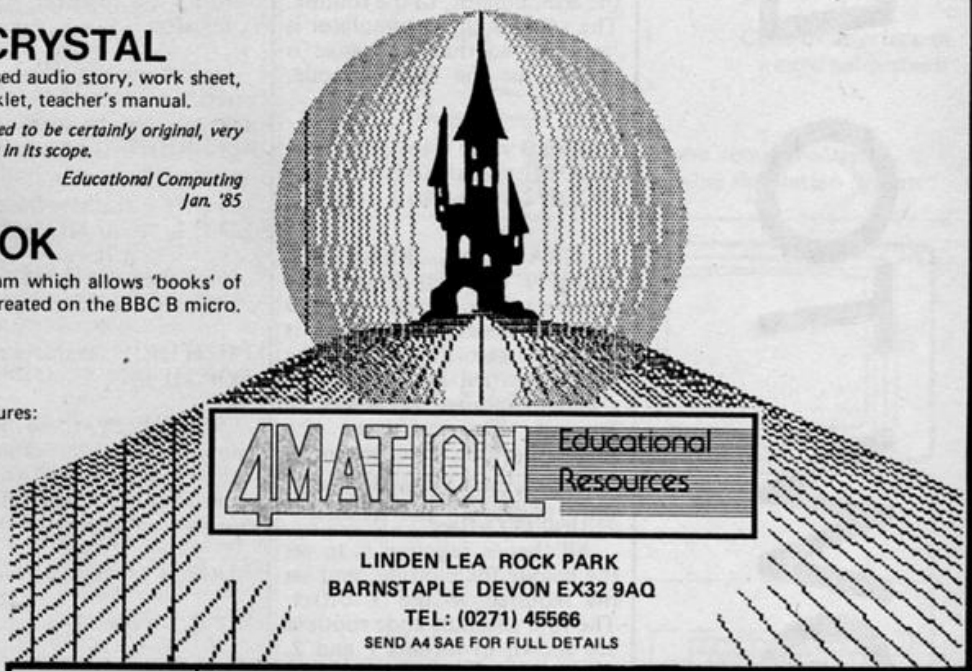
ALSO

Our two well established children's adventures:

GRANNY'S GARDEN

and

SPACEX



4MATION Educational Resources

LINDEN LEA ROCK PARK
BARNSTAPLE DEVON EX32 9AQ
TEL: (0271) 45566
SEND A4 SAE FOR FULL DETAILS

	BBC Disc	BBC Cassette	Spectrum Cassette	RML Disc
Dragon World	£17.65	£16.00	——	In preparation
Flowers of Crystal	£17.65	£16.00	——	In preparation
Tele-Book	£17.65	£15.00	——	——
Granny's Garden	£12.00	£10.00	£10.00	£12.00
Spacex	£10.40	£8.65	£8.65	——

Prices include P & P. Add 1. VAT on all items. 2. £3.50 for 3" disc. (£7.00 for TELE-BOOK 3" Disc)

PERIPHERAL



AMSTRAD SPEECH SYNTHESIZER

Voice control with dk'tronics' speech synthesizer

Amstrad Speech Synthesiser

Providing your computer with a voice, this exciting hardware from dk'tronics includes a full stereo sound system, complete with amplifier and twin four-inch speakers.

The speech synthesizer interfaces with the console through the floppy disc port. From here a short lead connects to the stereo output socket found next to the joystick port.

Accompanying the hardware is 4K of software, the driving force behind three of the four modes in which the speech chip can accessed.

The main ROM chip is the SP0256 speech chip, which is loaded with 59 discrete speech sounds called allophones, and five pauses of varying length.

Each spoken word is assembled from a combination of these phones. Mode 1, the direct mode, is used digitally, without the software provided.

Unique to each allophone is a one- or two- digit denary number. These are listed in the handbook provided with the speech synthesizer.

Passed to the speech chip location in the I/O memory map as data, these values kick each allophone into the speech buffer for outputting as spoken words.

Simple messages like 'Press enter to start' could be programmed in this way. It could prove useful to assemble a library of frequently used messages and prompts, listing all the appropriate allophone codes.

Perhaps the main advantage of this method is that no alteration to HIMEN is needed, as is the case in all the other modes.

Thinking of programs written by you which include some machine code routines, you may want to add speech; using this direct mode may well save considerable editing of the memory locations used in the host program.

Mode 2: using the |FEED command still requires the allophones to be accessed digitally. The bar, |, can be found on the shifted @ key.

Firstly, load the software which is provided on cassette. The |FEED command is followed by your chosen allophone codes which will be output as speech as soon as the program reaches the line containing this command.

There is a restriction here in that the |FEED command is limited to a maximum of 30 parameters. It is recommended that this mode is more appropriate to generating sound effects: doubless it will be the subject of a great deal of deafening stereophonic experimentation.

Mode 3 is the text to speech converter. Herein lies the heart of the system. With the software loaded and using the command words provided in the speech chip, you are able to convert written words directly into speech, without recourse to the cumbersome allophone codes.

The following example demonstrates the simplicity of the syntax used in this mode.

```
20 PRINT"|Home Computing
   Weekly"
```

On reaching this program line the speech chip will say whatever is within the quotes. That's all there is to it!

Notice the short diagonal line next to the usual quotation marks. This is typed by holding down the right hand shift key and pressing the key immediately to the left of it.

Try it now. Even without the speech synthesizer you should be able to print it to screen. This is all the syntax involved in directing your PRINT commands to the speech chip instead of to the screen.

Of course the appropriate command words have to be incorporated in your program. This is all explained in detail within the handbook, and presents no problems.

The text buffer holds 100 characters, consequently quite long strings of dialogue can be held in data, and these can be read individually or sequentially allowing whole phrases to be output as speech. Not having any limitations on the number of data statements allows for whole pages of Shakespeare or Spillane to be voiced at one go.

Mode 4: using printing mode command words, all outputs to the screen can be voiced at the same time. Your program listings can be read back, helping to trap those typing errors.

Even the screen messages are heard as well as being printed to the screen in the usual way. I nearly jumped out of my pram the first time I was told 'Ready'!!

Those then are the four modes within which the speech synthesizer is operated.

The eight command words all prefixed by the | sign allow easy control of all the functions, one of which is a speech speed control with 16 different values.

Although Dalek-like in intonation, careful experimentation with 'fonetik sspelling' clarifies most of the output until the words reach an acceptable standard. The challenge is in finding and remembering the best format to overcome some of the vagaries of our beautiful language.

A complete English word store requires some five megabytes of storage, making it impractical on home micros (this year anyway).

As though all this weren't good value for money, which it most certainly is, dk'tronics has built into the speech interface a stereo amplifier. Don't ask me why your music system requires one the size of a paving-stone — best ask Amstrad!

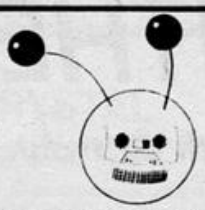
Price: £39.95

Manufacturer: dk'tronics

Address: Unit 6, Shire Hill Ind Est, Saffron Walden, Essex CB11 3AX

AMSTRAD





BANKRUPT STOCK — GAMES FROM 99p!!

Yes in this volatile industry *you* can benefit by buying TOP BRANDED software from 99p (+p/p). A *few* examples below, but new lines every day — from Q/SILVER, BUGBYTE, MICROPOWER, LOTHLORIEN, CDS etc. for SPECTRUM, CBM64, VIC-20 & BBC

99p	£1.49	£1.99
Manic Miner (Spec)	Traxx (Spec)	Skull (C64)
Bugaboo Man (Spec)	Birds (Spec)	Evil Dead (C64)
Everest Ascent (Sp)	Pixel Power (VIC-20)	Bricks (VIC-20)
Ship of Line (BBC)	Cosmiads (VIC-20)	Squish (VIC-20)
Timegate (Sp 48)	Zarm (BBC)	Demon Decorator (BBC)
Panic (VIC-20)	The Code (Spec)	Mined Out (BBC)

SEND PO/cheque + 25p (p&p) to AND/OR SEND SAE FOR FULL LIST (Mention Machine(s))

ALIEN SOFTWARE (H2)
46, WATLING AVENUE
BURNT OAK, MIDDX
01-951-4641

DUCKWORTH ADVENTURES

COLOSSAL CAVE ADVENTURE
by Peter Gerrard
The original and best mainframe adventure, now available for the Amstrad and Commodore 64. Unlike other versions, this game follows the original layout, complete with all the infuriating traps and bewildering mazes, not to mention the Troll, the Dragon, the Pirate or the mysterious shadowy figure. You can't call yourself an adventurer until you have conquered this mammoth quest! As a concession to the faint-hearted, you are allowed to resurrect yourself twice. £7.95

ISLAND ADVENTURE
by Peter Gerrard
The setting for this fascinating adventure game for the Commodore 64 is a desert island, on which you are stranded. Try to find your way off the island, avoiding monsters and other hostile inhabitants and collecting treasures. There is an option to save the current game status on tape. The game will accept a wide variety of words and is originally responsive. £7.95

MOUNTAIN PALACE ADVENTURE
by John D. Ryan
This devious adventure for the Amstrad and Commodore 64 is set in a long-lost palace in a distant land. You have heard rumours of the vast wealth to be gained by anyone brave enough to enter the palace. Unfortunately, the task turns out to be more difficult than you imagined, as the palace has some sinister inhabitants. Even the palace seems to have a mind of its own! There is an option to save your progress on tape at any time. £7.95

CASTLE DRACULA
by Ray Davies
Available for the Amstrad, BBC 32K and the Commodore 64, this game starts in a deserted village, overshadowed by Dracula's sinister castle. Your mission is to enter the castle and serve His Putrescence a well prepared stake. There are many useful objects to be found along the way, and from time to time the program can be persuaded to give you hints. There are 100 locations to explore and you have the option to save your progress on tape at any time. £7.95

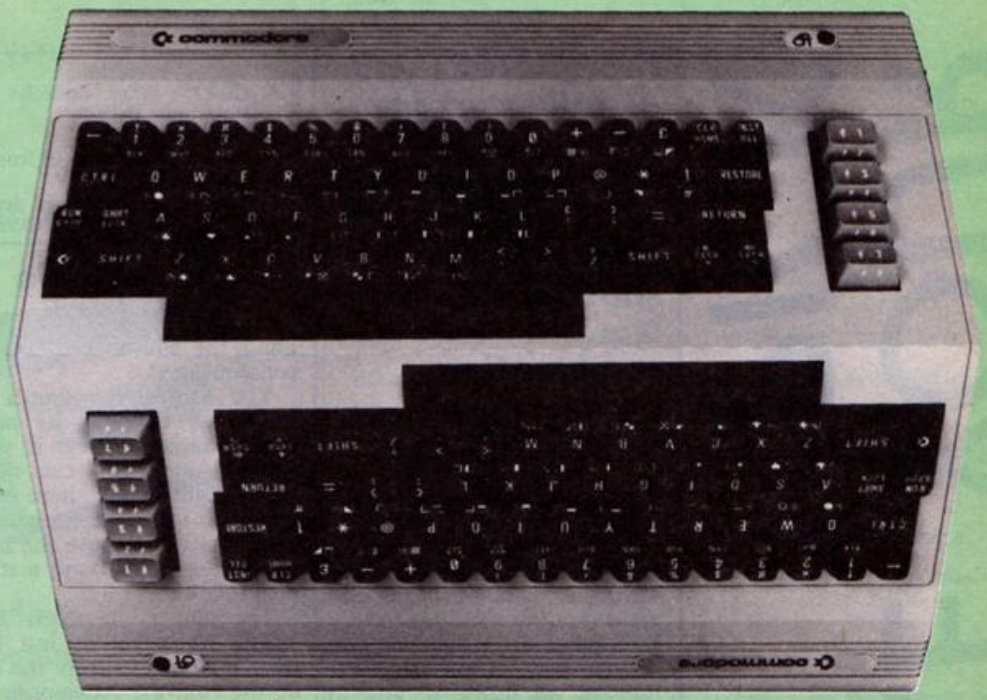
Write in for a descriptive catalogue (with details of cassettes).

Access VISA

DUCKWORTH
The Old Piano Factory, 43 Gloucester Crescent, London NW1 7DY
Tel: 01-485 3484

EXPANDING YOUR 64

Iain R Murray explains how you can expand your C64 to meet your particular needs



The enormous expansion possibilities of the Commodore 64 make it very easy to expand to suit anyone's needs, and to get the most from this machine.

As the 64's BASIC memory is volatile (lost when the computer is switched off) a backing store is virtually essential. For home micros, this usually comprises some form of magnetic recording unit, normally a cassette tape recorder or floppy disc drive.

Most 64 owners will also possess the Commodore C2N 'soap-on-a-rope' tape recorder. This reliable and comparatively cheap unit plugs directly into it's own port on the 64. It is adequate for most purposes, for saving small programs and data files, but compared with other tape storage systems it is very slow (loading 32K in just over ten minutes). This makes it rather a nuisance for storing long programs (as well as the increased expense of longer cassette tapes!) Some speed increasing hardware and software is now available, but those impatient and rich enough can obtain a disc drive.

The Commodore 1541 single floppy disc drive has all the usual advantages of a disc system over a cassette one: the contents of a disc can easily be listed, programs are found for you (no winding of tapes), disc storage is roughly as economical as tape in terms of K stored per penny, and, the disc drive is much faster than the cassette unit. Again, compared with other systems, the Commodore drive is rather slow (loading 32K in about 2 minutes). This is because the drive is connected to the 64 by a serial link, and hence data is passed one bit at a time along a wire, rather than one byte at a time along eight wires in the parallel data transmission system which is more common for disc drives. Despite these misgivings, the facilities offered by a disc drive are a Godsend to anyone used to working with cassette tape.

Another piece of essential hardware for the businessman or serious programmer is a printer — Commodore offers a wide range, some plug in directly, others can be added with suitable interfaces. The cheapest Commodore offer is the 1520, a four-colour pen-type printer/plotter offering 14 characters per second (cps) on 4-inch wide paper at 20, 40 or 80 characters per line (cpl). Reverse video characters appear underlined, and hi-resolution graphics and re-oriented (i.e. upside-down) characters are also possible. The 1525 is a tractor feed dot matrix printer offering 30 cps on A4 sized paper (or smaller) at up to 80 cpl. Reverse characters appear as on the screen, and various printing modes including user-defined graphics and double width are easily available.

A number of other printers are also available, the price depending on the speed and facilities offered. You could also buy a daisy-wheel type letter-quality printer, but these are more expensive and are aimed rather more at the businessman. The printers can be used to list programs for a detailed study and, with the appropriate software, text and graphic screens can also be dumped to the printer. They also are invaluable to the businessman or home user for printing out labels, letters and other documents prepared on a word processor or other printer-compatible software. Other printers, disc drives, etc. can be added to the 64, but these may require modified cables or specialised interfaces.

The 64's user port offers an eight bit parallel input/output port directly programmable from BASIC. Commodore produces a REL cartridge to allow the port to perform as a set of switches or sensors to external devices (robots, scientific apparatus, etc). This allows you to control virtually anything with your humble micro. A number of home-build projects for various purposes have been published in the electronics press, and many also include suggestions for control and monitoring applications.

You can see that the 64's expansion facilities make it much more than a number cruncher or games machine. Take a glance through the hardware adverts in a few magazines, and you should find some interesting projects to further your experience and use of your computer.

ORIC+ATMOS PROGRAM

TAKE YOUR PICK

The choice is your — take part in aerial combat, find your way out of a maze or pilot a space shuttle. Andrew Gardiner's combination

Oric-maze

The task is to escape from a 3D maze.

The screen will show a hi-resolution view of your position with the directions you can move in (the view the screen gives faces in the direction you last moved). If you can move forward you'll also be able to see the room directly ahead.

To find your way out you must try to build up a mental map of the maze you're in, or cheat by drawing one!

When you're facing the exit a suitable sign will appear, then you must simply move forward to freedom.

The program picks one out of a possible two mazes to aid a long term appeal.

The commands you can use are:

F or **FORWARD**
R or **RIGHT**
L or **LEFT**
B or **BACK**
Q or **QUIT**

Note: when typing in the DATA lines be very careful. One mistake could cause a lot of frustration.

How it works

30 switches off key-click
40-70 game in a series of subroutines
1000-1160 sets up variables, including the maze array variable
5000-5170 series of decisions which set up the next view
5500-5620 INPUT next move, check if move possible, make adjustments to maze variables
7000-7170 maze completed routine
8000-8660 hi-res draw routines for present view
9000-9680 DATA for both mazes

Variables

A (X,Y) array variables to store maze data
R room
R1 room immediately in front
D direction
L1/L2 variables used in decisions for view of next room

Space shuttle lander

Land the shuttle or face the consequences!

You control the shuttle by raising or lowering its nose, which causes a change in your descent rate. You can never gain height. Your nose level indicator tells you its present level. Trying to move the nose to 0 causes a stall and a steep dive follows.

The aim is to reach zero height when you're just less than 1500 metres from the end of the runway. Attempting to and sooner causes a crash!

Screen centre shows the present stage of the mission. As you change stages you need higher nose levels to achieve similar descent rates.

On skill levels greater than 0 cross-winds become an added complication. You must try to keep your bearing near to zero. Failure to do so reduces the rate at which you approach the runway, sometimes making it impossible to land.

Use cursor arrows to control direction, and left arrow subtracts, while right arrow adds.

Hint: you'll notice that your height is ten times less than the remaining distance. Use this as a rough guide.

How it works

30 switches off key-click/cursor, sets screen colours
100-175 all main loop equations, including bearing change
180-230 PLOT instrument readings
240-285 read keyboard, make adjustments
290-318 series of main loop checks
400-510 PLOTs runway for landing sequence
520-570 braking routine
600-700 landed routine, PRINTs scores, waits for key
750-840 crash routine
3000-6020 routines to PLOT status messages, adjust variables
7000-7070 PLOT gauges
8000-8100 select skill level, set variables
9000-9150 set up user-defined characters, POKE game title on status line

Variables

D distance to end of runway
H% height
S% speed
DR% descent rate
A/N% noise level (N% is PLOTted on screen)
B% bearing
R% controlling descent rate
SL% skill level
SC% your score

War plane

In this game you're the pilot of a fighter plane with cockpit view, and must shoot down the enemy in front by bringing it within your sights and firing. However, don't be too trigger-happy because you've a limited supply of laser bolts.

At the start you choose a time limit in which to destroy your city.

Each time you destroy a fighter the next will be quicker.

A constant readout of remaining laser bolts, reamining time and your number of hits is given.

Use the cursor keys to move the enemy and the space bar to fire.

30-80 game in a series of subroutines
1000-1210 set up user defined graphics
1300-1350 POKES game title on status line
2000-2110 selects time limit, sets variables
3000-3260 sets up screen
4000-4040 randomly moves enemy
4050-4130 reads keyboard, makes adjustments, PLOTs enemy
4140-4240 decreases remaining time, PLOTs present totals, makes series of checks
5000-5100 detect hit on enemy
6000-6310 enemy hit routine
7000-7070 PLOT city/sound alarm
8000-8320 city destroyed routine
8330-8420 PRINT scores, wait for a key

Variables

T time remaining
LZ remaining laser bolts
HT number of hits
A/A1 new/old horizontal position of enemy
B/B1 new/old vertical position of enemy
M variable controlling speed of enemy
T$ game title to be POKEd on status line
J register controlling ability to fire
F register to check if 'Fire' key pressed
HI hi-score
N$ name of hi-scorer

Listing 1 Oric-maze

```
 10 REM          ORIC-MAZE
 20 REM  BY A.P.GARDNER ,5/3/1984
 25 REM
 30 PRINTCHR$(6)
 35 REM
 40 GOSUB1000 'INITIALISE VARIABLES
 50 GOSUB5000 'MAIN GAME
 60 GOSUB7000 'END OF GAME
 70 RUN40
 80 REM
 990 REM INITIALISE VARIABLES
 1000 DIMA(37,3):CLS
 1010 M=INT(RND(1)*2)
 1020 IFM=0THENR=16:R1=17:D=1:GOTO1100
 1030 FORN=1TO148
 1040 READA
 1050 NEXTN
 1060 R=15:R1=9:D=2
 1090 REM SET UP MAZE
 1100 FORN=1TO36
 1110 FORZ=0TO3
 1120 READA
 1130 A(N,Z)=A
 1140 NEXTZ
 1150 NEXTN
 1160 RETURN
 4990 REM MAIN GAME
 5000 HIRES
 5010 L1=D-1
 5020 IFL1<0THENL1=3
 5030 L2=D+1
 5040 IFL2>3THENL2=0
 5050 GOSUB8000
 5060 IFA(R,L1)>0THENGOSUB8050:GOTO5080
 5070 GOSUB8100
 5080 IFA(R,L2)>0THENGOSUB8150:GOTO5100
 5090 GOSUB8200
 5100 IFA(R,D)=0THENGOSUB8250:GOTO5500
 5110 IFA(R,D)=37THENGOSUB8300:GOTO5500
 5120 GOSUB8350
 5130 IFA(R1,L1)>0THENGOSUB8450:GOTO5150
 5140 GOSUB8500
 5150 IFA(R1,L2)>0THENGOSUB8550:GOTO5170
 5160 GOSUB8600
 5170 IFA(R1,D)=0THENGOSUB8650
 5490 REM PLAYER'S NEXT MOVE
 5500 K=0:D1=D-2
 5510 IFD1=-1THEND1=3
 5520 IFD1=-2THEND1=2
 5530 INPUT"WHAT DIRECTION NOW ";DR$
 5540 L$=LEFT$(DR$,1)
 5550 IFL$="F"ANDA(R,D)>0THENR=A(R,D):R1=A(R,D):K=1
 5560 IFL$="R"ANDA(R,L2)>0THENR=A(R,L2):R1=A(R,L2):K=1:
D=L2
 5570 IFL$="B"ANDA(R,D1)>0THENR=A(R,D1):R1=A(R,D1):K=1:
D=D1
 5580 IFL$="L"ANDA(R,L1)>0THENR=A(R,L1):R1=A(R,L1):K=1:
D=L1
 5590 IFL$="Q"THENTEXT:END
 5600 IFK=0THENPRINT"OUCH! I HIT A WALL":GOTO5530
 5610 IFR=37THENRETURN
 5620 GOTO5000
 6990 REM MAZE COMPLETED ROUTINE
 7000 TEXT
 7010 FORN=0TO7
 7020 PAPERN
 7030 MUSIC1,3,(N+1),8
 7040 WAIT50
 7050 NEXTN
 7060 FORN=1TO12
 7070 MUSIC1,5,N,8
 7080 WAIT10
 7090 NEXTN
 7100 MUSIC1,1,1,0
 7110 PRINT:PRINT:PRINTSPC(12)"WELL DONE!"
 7120 PRINT:PRINT:PRINTSPC(1)"I DIDN'T KNOW YOU HAD IT
IN YOU!"
 7130 PRINT:PRINT:PRINTSPC(2)"DO YOU WANT TO TRY AGAIN
(Y/N)"
 7140 K$=KEY$
 7150 GETK$
 7160 IFK$="Y"THENRETURN
 7170 END
 7980 REM DRAW ROUTINES FOR PRESENT
   VIEW
 7990 REM MAIN SECTION OF THE ROOM
 8000 CURSET20,65,1:DRAW0,70,1:CURSET220,65,1:DRAW0,70,
1
 8010 CURSET50,65,1:DRAW20,10,1:CURSET50,135,1:DRAW20,-
10,1
 8020 CURSET170,75,1:DRAW20,-10,1:CURSET170,125,1:DRAW2
0,10,1
 8030 RETURN
 8040 REM CAN MOVE LEFT
 8050 CURSET20,65,1:DRAW30,0,1:DRAW0,70,1:DRAW-30,0,1

 8060 RETURN
 8090 REM NO LEFT
 8100 CURSET20,65,1:DRAW0,-15,1:DRAW30,15,1
 8110 CURSET20,135,1:DRAW0,15,1:DRAW30,-15,1
 8120 RETURN
 8140 REM CAN MOVE RIGHT
 8150 CURSET220,65,1:DRAW-30,0,1:DRAW0,70,1:DRAW30,0,1
 8160 RETURN
 8190 REM NO RIGHT
 8200 CURSET220,65,1:DRAW0,-15,1:DRAW-30,15,1
 8210 CURSET220,135,1:DRAW0,15,1:DRAW-30,-15,1
 8220 RETURN
 8240 REM NO FORWARD
 8250 CURSET70,75,1
 8260 DRAW100,0,1:DRAW0,50,1:DRAW-100,0,1:DRAW0,-50,1
 8270 RETURN
 8290 REM EXIT SIGN
 8300 CURSET70,75,1:DRAW100,0,1:CURSET100,75,1:DRAW0,14
,1
 8310 DRAW40,0,1:DRAW0,-14,1:CURSET105,78,3:CHAR69,0,1

 8320 CURMOV8,0,3:CHAR88,0,1:CURMOV8,0,3:CHAR73,0,1
 8330 CURMOV8,0,3:CHAR84,0,1
 8335 CURSET70,75,1:DRAW0,50,1:CURSET170,75,1:DRAW0,50,
1
 8340 RETURN
 8345 REM MAIN SECTION OF FAR ROOM
 8350 CURSET70,75,1:DRAW10,5,1:CURSET70,125,1:DRAW10,-5
,1
 8360 CURSET170,75,1:DRAW-10,5,1:CURSET170,125,1:DRAW-1
0,-5,1
 8370 CURSET95,87,1:DRAW5,3,1
 8380 CURSET95,113,1:DRAW5,-3,1
 8390 CURSET145,87,1:DRAW-5,3,1
 8400 CURSET145,113,1:DRAW-5,-3,1
 8410 CURSET100,90,1:DRAW0,20,1:CURSET140,90,1:DRAW0,20
,1
 8420 RETURN
 8440 REM OPENING ON FAR LEFT
 8450 CURSET80,87,1:DRAW15,0,1:DRAW0,26,1:DRAW-15,0,1
 8460 CURSET80,80,1:DRAW0,40,1
 8470 RETURN
 8490 REM NO FAR LEFT
 8500 CURSET80,80,1:DRAW15,7,1:CURSET80,120,1:DRAW15,-7
,1
 8510 RETURN
 8540 REM OPENING ON FAR RIGHT
 8550 CURSET160,87,1:DRAW-15,0,1:DRAW0,26,1:DRAW15,0,1
 8560 CURSET160,80,1:DRAW0,40,1
 8570 RETURN
 8590 REM NO FAR RIGHT
 8600 CURSET160,80,1:DRAW-15,7,1:CURSET160,120,1:DRAW-1
5,-7,1
 8610 RETURN
 8640 REM NO FAR CENTRE
 8650 CURSET100,90,1:DRAW40,0,1:CURSET100,110,1:DRAW40,
0,1
 8660 RETURN
 8990 REM DATA FOR MAZE 1
 9000 DATA7,0,0,0,8,3,0,0
 9010 DATA0,4,0,2,0,5,0,3
 9020 DATA11,6,0,4,12,0,0,5
 9030 DATA13,8,1,0,0,9,2,7
 9040 DATA0,10,0,8,0,11,0,9
 9050 DATA17,0,5,10,18,0,6,0
 9060 DATA0,14,7,0,0,15,0,13
 9070 DATA21,0,0,14,0,17,0,0
 9080 DATA23,0,11,16,24,0,12,0
 9090 DATA25,20,0,0,26,0,0,19
 9100 DATA0,22,15,0,0,23,0,21
 9110 DATA0,0,17,22,30,0,18,0
 9120 DATA31,0,19,0,0,27,20,0
 9130 DATA33,28,0,26,0,29,0,27
 9140 DATA0,30,0,28,36,0,24,29
 9150 DATA37,0,25,0,0,33,0,0
 9160 DATA0,34,27,32,0,0,0,33
 9170 DATA0,36,0,0,0,0,30,35
 9180 DATA0,0,0,0
 9490 REM DATA FOR MAZE 2
 9500 DATA7,2,0,0,0,3,0,1
 9510 DATA0,4,0,2,10,5,0,3
 9520 DATA11,0,0,4,12,0,0,0
 9530 DATA13,0,1,0,14,9,0,0
 9540 DATA15,10,0,8,16,0,4,9
 9550 DATA0,0,5,0,18,0,6,0
 9560 DATA19,0,7,0,20,0,8,0
 9570 DATA0,0,9,0,22,17,10,0
 9580 DATA23,18,0,16,24,0,12,17
 9590 DATA0,20,13,0,0,21,14,19
 9600 DATA0,22,0,20,0,0,16,21
 9610 DATA29,0,17,0,0,0,18,0
 9620 DATA31,26,0,0,32,0,0,25
```





```
 9630 DATA0,28,0,0,34,29,0,27
 9640 DATA0,0,23,28,36,0,0,0
 9650 DATA37,0,25,0,0,33,26,0
 9660 DATA0,34,0,32,0,35,28,33
 9670 DATA0,36,0,34,0,0,30,35
 9680 DATA0,0,0,0
```

Listing 2 War plane

```
 10 REM      **  WAR PLANE  **                          **
          **
 20 REM BY A.P.GARDNER ,16/9/1983                ---------
----------------
 25 REM     (IMPROVED 13/3/1984)
 30 GOSUB1000 'UDG.S
 40 GOSUB2000 'VARIABLES
 50 GOSUB3000 'SCREEN
 60 GOSUB4000 'MAIN GAME
 70 GOSUB8000 'CITY DESTROYED
 80 GOTO40     'START AGAIN
 90 REM
 990 REM SET UP USER DEFINED GRAPHICS
 1000 PRINTCHR$(6);CHR$(17)
 1010 FORP=(46080+(97*8))TO(46080+(115*8)+7)
 1020 READUS:POKEP,US:NEXTP
 1030 DATA0,4,2,1,1,1,63,2
 1040 DATA0,0,0,12,63,63,30,0
 1050 DATA0,8,16,32,32,32,63,16
 1060 DATA42,0,42,0,42,0,42,0
 1070 DATA63,12,30,30,30,30,12,0
 1080 DATA12,26,53,43,53,53,39,45
 1090 DATA61,43,57,43,45,51,45,63
 1100 DATA0,0,63,33,33,33,33,33
 1110 DATA33,33,33,33,33,63,0,0
 1120 DATA63,63,63,63,63,63,63,63
 1130 DATA63,48,47,40,44,43,43,43
 1140 DATA63,0,63,0,0,63,63,63
 1150 DATA63,3,61,5,13,53,53,53
 1160 DATA43,43,43,43,43,43,43,43
 1170 DATA53,53,53,53,53,53,53,53
 1180 DATA43,43,43,44,40,47,48,63
 1190 DATA63,63,63,0,0,63,0,63
 1200 DATA53,53,53,13,5,61,3,63
 1210 DATA0,0,0,12,12,0,0,0
 1290 REM TITLE ON STATUS LINE
 1300 T$="WAR PLANE":MD=1
 1310 FORT=48016TO48024
 1320 POKET,ASC(MID$(T$,MD,1))
 1330 MD=MD+1
 1340 NEXTT
 1350 RETURN
 1990 REM SELECT TIME LIMIT/SET VARS.
 2000 CLS:PING
 2010 PRINT:PRINT:PRINT"WHAT IS YOUR TIME LIMIT (100-20
)"
 2020 INPUT"(100 IS THE EASIEST)";L
 2030 IFL<20ORL>100THEN2000
 2040 T=L
 2050 LZ=INT(T/10)+10
 2060 HT=0:M=.4:J=0:B=8:B1=8:CT=0
 2070 LR=INT(RND(1)*2)
 2080 IFLR=0THENA=6
 2090 IFLR=1THENA=28
 2100 A1=A
 2110 RETURN
 2990 REM SET UP SCREEN
 3000 CLS:PAPER6:INK0
 3010 PRINT"jjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjj"
 3020 PRINT"jkllllllllllllllllllllllllllllllmj"
 3030 FORN=1TO11
 3040 PRINT"jn                                    oj"
 3050 NEXTN
 3060 PRINT
 3070 PRINT"jjqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqjj"
 3080 PRINT"jjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjj"
 3090 PRINT:PRINT:PRINT
 3100 PRINT"jjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjj"
 3110 PRINT"jjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjj"
 3120 PRINT"jkllllllllllllllllllllllllllllllmj"
 3130 FORN=1TO3
 3140 PRINT"jn                                    oj"
 3150 NEXTN
 3160 PRINT"jpqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqrj"
 3170 PLOT1,26, "jjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjj"
 3180 POKE48562,16:POKE48598,22
 3190 POKE48680,16:POKE48760,16
 3200 POKE48720,16:POKE48721,2
 3210 PLOT13,13," RED ALERT "
 3220 PLOTA,B,"abc"
 3230 PLOT18,6,"h":PLOT18,9,"i"
 3240 PLOT4,17,"LAZ.":PLOT15,17,"TIME"
 3250 PLOT27,17,"HITS"
 3260 RETURN
 3990 REM MAIN GAME
```



```
 4000 MO=INT(RND(1)*5)
 4010 IFMO=0ANDA>(3+M)THENA=A-M
 4020 IFMO=1ANDA<(33-M)THENA=A+M
 4030 IFMO=2ANDB<(12-M)THENB=B+M
 4040 IFMO=3ANDB>(2+M)THENB=B-M
 4050 P=PEEK(520)
 4060 IFP=172ANDA>(3+M)THENA=A-M
 4070 IFP=188ANDA<(33-M)THENA=A+M
 4080 IFP=156ANDB>(2+M)THENB=B-M
 4090 IFP=180ANDB<(12-M)THENB=B+M
 4100 IFP=132ANDJ=0THENF=1
 4110 PLOTA1,B1,"   "
 4120 PLOTA,B,"abc"
 4130 A1=A:B1=B
 4140 PLOT18,6,"h":PLOT18,9,"i"
 4150 IFF=1THEN5000
 4160 T=T-.3
 4170 K=INT(T)
 4180 PLOT8,17,STR$(LZ)+" "
 4190 PLOT19,17,STR$(K)+" "
 4200 PLOT31,17,STR$(HT)+" "
 4210 IFT<1THENRETURN
 4220 IFLZ<1THENJ=1
 4230 IFT<6THENGOSUB7000
 4240 GOTO4000
 4990 REM DETECT HIT ON ENEMY
 5000 PLOT14,12,"/":PLOT23,12,"\"
 5010 PLAY0,1,1,1000
 5020 LZ=LZ-1
 5030 F=0:WAIT10
 5040 PLOT17,9,"/":PLOT19,8,"\"
 5050 PLOT14,12," ":PLOT23,12," "
 5060 WAIT30
 5070 PLOT17,9," ":PLOT19,8," "
 5080 IFSCRN(18,7)<>32THEN6000
 5090 IFSCRN(18,8)<>32THEN6000
 5100 GOTO4160
 5990 REM ENEMY IS HIT
 6000 POKE48561,0
 6010 PLOT4,23,"                                  "
 6020 PLOT4,24,"                                  "
 6030 PLOT18,6," ":PLOT18,9," "
 6040 PLOTA,B,"abc"
 6050 WAIT50
 6060 PLAY0,1,1,500
 6070 PLOT18,8,"d"
 6080 WAIT40
 6090 PLOTA,B,"ddd"
 6100 PLAY0,1,1,1500
 6110 WAIT40
 6120 PLOTA,B,"   "
 6130 A=A+1:W=A:X=A:Y=B:Z=B
 6140 FORN=1TO5
 6150 W=W+2:X=X-2:Y=Y-1:Z=Z+1
 6160 PLOTW,B,"s":PLOTX,B,"s"
 6170 PLOTA,Y,"s":PLOTA,Z,"s"
 6180 PLAY0,1,1,100
 6190 WAIT10
 6200 PLOTW,B," ":PLOTX,B," "
 6210 PLOTA,Y," ":PLOTA,Z," "
 6220 NEXTN
 6230 WAIT100
 6240 PLOT18,6,"h":PLOT18,9,"i"
 6250 HT=HT+1
 6260 T=L:M=M+.05:F=0:LZ=INT(T/10)+10:B=8:B1=8:CT=0
 6270 LR=INT(RND(1)*2)
 6280 IFLR=0THENA=6
 6290 IFLR=1THENA=28
 6300 A1=A
 6310 GOTO4000
 6990 REM CITY APPEARS
 7000 PLAY1,0,1,750
 7010 IFCT>0THENRETURN
 7020 POKE48561,6
 7030 PLOT4,23,"       f    f       ff  f    f"
 7040 PLOT4,24,"ff ffffg fffgf    ffgg fgfffg"
 7050 PLOT13,13," RED ALERT "
 7060 CT=1
 7070 RETURN
 7990 REM THE CITY IS DESTROYED
 8000 IFB>10THENB100
 8010 IFB>11THENB140
 8020 FORN=(B+1)TO12
 8030 PLOTA+1,N,"e"
 8040 PLAY0,1,1,50
 8050 WAIT50
 8060 PLOTA+1,N," "
 8070 PLOT18,6,"h":PLOT18,9,"i"
 8080 NEXTN
 8090 GOTO8140
 8100 PLOTA+1,B+1,"e"
 8110 PLAY0,1,1,50
 8120 WAIT50
 8130 PLOTA+1,B+1," "
 8140 FORN=13TO21
 8150 PLAY0,1,1,30
```

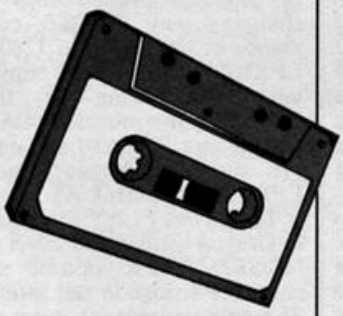




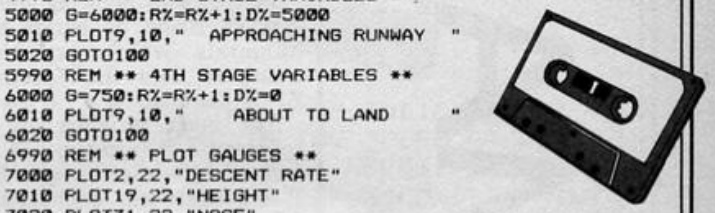


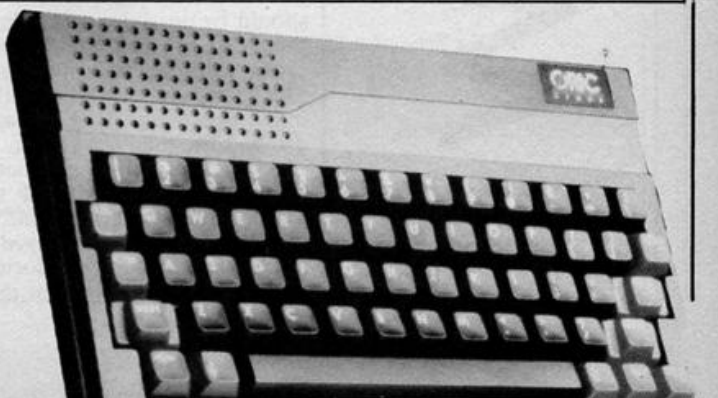
```
 8160 WAIT40
 8170 NEXTN
 8180 PLOTA+1,22,"e"
 8190 PLAY0,1,1,30
 8200 WAIT40
 8210 PLOTA+1,22," "
 8220 PLOTA+1,23,"e"
 8230 PLAY0,1,1,25
 8240 WAIT20
 8250 PAPER7:INK7
 8260 PLAY0,1,1,4000
 8270 PLOTA,23,"ddd"
 8280 WAIT20
 8290 PAPER4:INK0:POKE48598,20:POKE48721,2
 8300 PLOT4,24,"ddddddddddddddddddddddddddddddd"
 8310 PLAY0,1,1,10000
 8320 WAIT500
 8330 PAPER0:INK7:CLS
 8340 K$=KEY$
 8350 PRINT:PRINT:PRINT
 8360 PRINTSPC(3)"THE CITY HAS BEEN DESTROYED"
 8370 PRINT:PRINT:PRINTSPC(9)"YOU HAD ";HT;"HITS"
 8380 IFHT>HITHENHI=HT:PRINT:INPUT"WHAT IS YOUR NAME";N
$
 8390 PRINT:PRINT:PRINT"HIGH SCORE TODAY IS ";HI;"BY ";
N$
 8400 PRINT:PRINT:PRINT:PRINTSPC(4)"PRESS A KEY TO PLAY
 AGAIN"
 8410 GETA$
 8420 RETURN
```

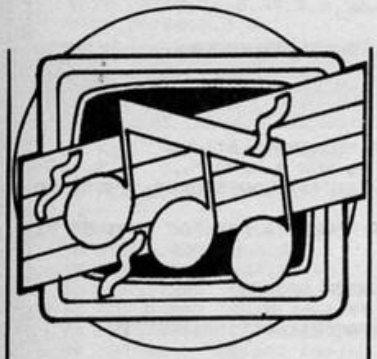
Listing 3 Space shuttle lander



```
 10 REM   SPACE SHUTTLE LANDER                    -------
-------------
 20 REM BY A.P.GARDNER ,6/2/1984                  ---------
---------------
 30 POKE£26A,10:PAPER0:INK7
 40 GOSUB9000
 50 GOSUB8000
 60 GOSUB3000
 70 GOSUB7000
 90 REM ** MAIN LOOP **
 100 DR%=INT(S%*(SIN(A))/R%)
 110 H%=H%-DR%
 120 S%=INT(90+(170*A))
 130 D=D-(INT(S%*(COS(A))/2))
 140 D=D+ABS(B%)
 150 N%=A*10
 160 B=INT(RND(1)*2)
 170 IFB=0THENB%=B%-SL%
 175 IFB=1THENB%=B%+SL%
 180 PLOT14,22,STR$(DR%)+" "
 190 PLOT25,22,STR$(H%)+" "
 200 PLOT35,22,STR$(N%)+" "
 210 PLOT14,24,STR$(S%)+" "
 220 PLOT28,24,STR$(B%)+" "
 230 PLOT30,26,STR$(D)+" "
 240 P=PEEK(520)
 250 IFP=172THENB%=B%-SL%
 260 IFP=188THENB%=B%+SL%
 270 IFP=180THENA=A+.1
 280 IFP=156THENA=A-.1
 285 IFP=56THENSC%=SC%+(SL%+1)
 290 IFH%<0THEN330
 300 IFA<.1THENA=1:N%=10
 310 IFD<D%THENGOTO6
 315 IFA>1.2THENA=1.2
 317 IFB%<-50THENB%=-50
 318 IFB%>50THENB%=50
 320 GOTO100
 330 IFD>1500THEN750
 340 IFS%>(150-(SL%*2))THEN750
 390 REM ** LANDED ? **
 400 CLS
 410 PLOT17,1,"/ \":PLOT16,2,"/   \":PLOT15,3,"/  :  \"
:PLOT14,4,"/   :   \"
 420 PLOT13,5,"/    :    \":PLOT12,6,"/     :     \":PL
OT11,7,"/      :      \"
 430 PLOT10,8,"/                \":PLOT9,9,"/         :
  \"
 440 PLOT8,10,"/                    \":PLOT7,11,"/
   :         \"
 450 PLOT6,12,"/                       \"
 460 PLOT5,13,"/             :           \"
 470 PLOT4,14,"/                          \"
 480 PLOT3,15,"/                b           \"
 490 PLOT2,16,"/                              \"
 500 PLOT1,17,"/                  b             \"
 510 PLOT9,24,"SPEED":PLOT4,26,"DISTANCE TO END OF RUNW
AY"
 520 S%=S%-1:D=D-5
 530 PLOT14,24,STR$(S%)+" "
 540 PLOT30,26,STR$(D)+" "
 550 IFS%<1THEN600
 560 IFD<1THEN750
 565 WAIT(40-(S%/4))
 570 GOTO520
 590 REM ** YOU'VE DONE IT **
 600 CLS
 610 FORN=1TO12:MUSIC1,2,N,10:WAIT25:NEXTN
 620 FORM=1TO3
 630 FORN=1TO12:MUSIC1,2,N,8:NEXTN
 635 MUSIC1,1,1,0
 640 NEXTM
 650 PRINT:PRINT:PRINTSPC(9)"CONGRATULATIONS!"
 660 PRINT:PRINTSPC(8)"YOU'RE NOW A HERO!"
 670 PRINT:PRINT:PRINT:PRINTSPC(6)"YOU SCORED ";SC%;"PO
INTS"
 680 PRINT:PRINT:PRINTSPC(1)"PRESS A KEY FOR ANOTHER MI
SSION"
 690 K$=KEY$
 700 K$=KEY$:IFK$<>""THENRUN50ELSE700
 740 REM ** YOU'VE CRASHED **
 750 PAPER7:EXPLODE:WAIT50:PAPER1:WAIT150:PAPER0
 760 CLS
 770 PRINT:PRINTSPC(3)"PLEASE ACCEPT MY CONDOLENCES"
 780 IFS%<(150-(SL%*2))THEN800
 790 PRINT:PRINTSPC(3)"YOU WERE TOO FAST ON LANDING"
 800 IFD>0ANDD<1500THEN820
 810 PRINT:PRINTSPC(2)"YOU SLIGHTLY MISSED THE RUNWAY"
 820 PRINT:PRINTSPC(1)"YOU'RE NOT VERY POPULAR WITH THE
"
 830 PRINTSPC(12)"PRESIDENT"
 840 GOTO670
 2990 REM ** 1ST SCREEN **
 3000 CLS
 3010 PLOT16,8,"STATUS:"
 3020 PLOT9,10,"PASSING THROUGH CLOUDS"
 3030 RETURN
 3990 REM ** 1ST STAGE VARIABLES **
 4000 G=5000:R%=R%+1:D%=10000
 4010 PLOT9,10,"  BELOW CLOUD LEVEL    "
 4020 GOTO100
 4990 REM ** 2ND STAGE VARIABLES **
 5000 G=6000:R%=R%+1:D%=5000
 5010 PLOT9,10,"  APPROACHING RUNWAY   "
 5020 GOTO100
 5990 REM ** 4TH STAGE VARIABLES **
 6000 G=750:R%=R%+1:D%=0
 6010 PLOT9,10,"    ABOUT TO LAND      "
 6020 GOTO100
 6990 REM ** PLOT GAUGES **
 7000 PLOT2,22,"DESCENT RATE"
 7010 PLOT19,22,"HEIGHT"
 7020 PLOT31,22,"NOSE"
 7030 PLOT9,24,"SPEED"
 7040 PLOT20,24,"BEARING"
 7050 PLOT4,26,"DISTANCE TO END OF RUNWAY"
 7060 FORN=22TO26STEP2:PLOT1,N,2:NEXTN
 7070 GOTO100
 7990 REM ** SELECT SKILL LEVEL **                **    S
ET VARIABLES    **
 8000 CLS:PING
 8010 PRINT:PRINT:PRINT:PRINTSPC(1)"PLEASE SELECT SKILL
 LEVEL (0-15)"
 8020 PRINT:PRINTSPC(8)"(0 IS THE EASIEST)"
 8030 PRINT:INPUTSL%
 8035 IFSL%<0ORSL%>15THENGOTO8000
 8040 A=.1:D=40000:S%=100:R%=2:D%=20000
 8050 B%=0:DR%=0:G=4000
 8060 H%=4000+(SL%*(INT(RND(1)*50)))
 8100 RETURN
 8990 REM SET USER DEFINED GRAPHICS           ** GAME TI
TLE ON STATUS LINE **
 9000 FORP=46080+(97*8)TO46080+(98*8)+7
 9010 READU:POKEP,U:NEXTP
 9020 DATA63,63,63,63,63,63,63,63
 9030 DATA18,18,18,18,18,18,18,18
 9100 Z$="aaaaaaaaa SPACE SHUTTLE LANDER aaaaaaaaa"
 9110 N=1:FORP=48000TO48039
 9120 POKEP,(ASC(MID$(Z$,N,1)))
 9130 N=N+1
 9140 NEXTP
 9150 RETURN
```







MUSIC MAKER



Write or convert music for your Spectrum, or convert Dragon listings with this utility by Tony Houlton

This program simulates the Dragon PLAY command by allowing you to enter a string of letters and numerals which are then translated into the Spectrum BEEP commands.

The main variables are as follows: T — tempo, O — octave, L — note length and P — pause length. Each letter is followed by a number, if you don't include them then the following default values are set by the computer:

T2 — roughly equivalent to 4/4 time; 02 — the octave below middle C; L4 — gives a note length equivalent to a ¼ note duration. No default value is set for P, but the pauses have the same duration as the note lengths e.g. P8 gives a pause equivalent to the duration of an eighth note. The notes are entered by using the letters A to G.

You can also modify notes by using the relevant symbols for sharps, flats and dotted notes etc.

The first part of the program describes the variables and their parameters and shows the normal musical notation and the program equivalents. It should be possible, with a little practice, to translate written music into the program code. The computer translates this into Spectrum BEEPs and displays these on the screen.

As each BEEP is calculated the note is sounded and the pitch and duration values displayed. The tune is played at normal speed and the information redisplayed. You can then replay the tune as many times as you wish without losing the information. When you have copied the BEEP values for future use you can return to the menu to enter more music. You can have a printed copy by changing any PRINT commands in lines 1240 to 1280 to LPRINT. If you want a copy of your original string entry, then break into the program (CAPS SHIFT and BREAK) and enter the direct addressing mode LPRINT or PRINT A$.

To convert PLAY commands in Dragon listings you select the MUSICMAKER option and enter the strings in the listings. The only variables that are not found in this program will be the letter V followed by a number. This controls the volume. There is no volume control on the Spectrum and so these are ignored.

The other sound command on the Dragon is SOUND. This plays a given note for a given duration and a short program (line 1340 onwards) to deal with this conversion has been included.

The only difficulty that will be encountered is that the Spectrum will not BEEP for longer than 10 seconds. If the second number after SOUND is larger than 160 then subtract 160 from the value and enter as two separate values. SOUND 90,192 could be entered as SOUND90,160 : SOUND90,32 translated as BEEP 10,0 : BEEP 2,0. If you want to speed the program up by leaving out the BEEPs during the calculation then omit line 1070.

How it works

10-15 put CAPS LOCK on, directs to graphics routine
30-50 MUSICMAKER or SOUND selection routine
70-225 menu of instructions, selection routine
230-355 details of variables and parameters
360 input point for string of variables
370-440 set default values for T, O, L
450-580 main loop to read input, allocate items in A$ to subroutines
590-700 calculation of tempo
710-810 calculation of octave start values
820-930 calculation of note length
940-1020 allocation of relative pitch values to note letters
1030-1090 calculation of pitch and duration; first print and sound
1100-1190 calculation of pause length
1200-1230 play tune at correct speed
1240-1280 list Spectrum BEEP values
1290-1300 play and list again or return to menu
1340-1360 instructions for Dragon SOUND conversion
1370-1380 input of Dragon SOUND values
1390-1400 conversion calculations
1410-1420 display Spectrum values and play sound
1430-1460 options for another SOUND conversion or return to menu
1470-1490 graphics POKE routine
1500-1660 DATA values for graphics characters

Variables

A$ string holiday input variables
T tempo
O octave
L note length
P pause length
A to **G** note pitch values
H(K) number array holding pitch values
J(K) number array holding values
K note counter

```
"  10 CLS : POKE 23658,8: PRINT "  MUSICMAKER AND DRAGON SOUND      ************
**************       CONVERSIOIN BY R.A.HOULTON        ************************
          NOVEMBER 1984                          **************"
   15 GO SUB 1470
   20 PRINT : PRINT "     THE MUSICMAKER PROGRAMME IS SIMILAR IN FORMAT TO THE DRA
 GON PLAY COMMAND."
   30 PRINT : PRINT "     A SHORT PROGRAMME TO CONVERTTHE DRAGON SOUND COMMAND FOR
  USEON THE SPECTRUM IS ALSO INCLUDED"
   40 PRINT : PRINT "PRESS ""M"" FOR MUSICMAKER OR ""S""     FOR DRAGON SOUND PROG
RAMME"
   50 IF INKEY$="" THEN  GO TO 50
   60 IF INKEY$="S" THEN  GO TO 1350
   70 CLS : PRINT "THIS PROGRAM ALLOWS YOU TO COPY OR COMPOSE MUSIC FOR YOUR 16K
 OR48K SPECTRUM USING ALPHABETIC   AND NUMERIC TERMS FOR THE NOTES,NOTE LENGTH, T
EMPO, OCTAVE AND  PAUSES ETC.": PRINT : PRINT "TO SEE THE VARIABLES AND THEIR  P
ARAMETERS PRESS Z, ANY OTHER   KEY TO WRITE MUSIC"
   80 IF INKEY$="" THEN  GO TO 80
   90 IF INKEY$<>"Z" THEN  GO TO 360
  140 CLS : PRINT TAB 4;"VARIABLES AND PARAMETERS": PRINT TAB 4;"**************
********": PRINT : PRINT "1. TEMPO": PRINT : PRINT "2. NOTE LENGTH": PRINT : PRI
NT "3. NOTES": PRINT : PRINT "4. OCTAVE": PRINT : PRINT "5. MODIFIERS": PRINT :
 PRINT "6. PAUSES": PRINT : PRINT "7. TO WRITE A TUN": PRINT : PRINT "PLEASE SELE
T BY NUMBER"
  150 IF INKEY$="" THEN  GO TO 150
  160 IF INKEY$="1" THEN  GO TO 230
  170 IF INKEY$="2" THEN  GO TO 240
  180 IF INKEY$="3" THEN  GO TO 250
  190 IF INKEY$="4" THEN  GO TO 330
  200 IF INKEY$="5" THEN  GO TO 340
  210 IF INKEY$="6" THEN  GO TO 350
  220 IF INKEY$="7" THEN  GO TO 360
  225 GO TO 150
```



```
  230 CLS : PRINT "TEMPO": PRINT "*****": PRINT : PRINT "TEMPO IS INDICATED BY TH
E LETTERT FOLLOWED BY A NUMBER": PRINT : PRINT "THE TEMPO IS THE SPEED AT WHICH
THE PIECE IS PLAYED.  A VALUE   BETWEEN 1 AND 10 WILL MEET MOST NEEDS.": PRINT :
 PRINT "T2 IS A SPEED OF ONE BEAT PER   SECOND, T4 TWO BEATS PER SECOND": PRINT
: PRINT "IF YOU DO NOT ENTER A VALUE FOR T THE COMPUTER WILL ALLOCATE THEVALUE T
2": PRINT : PRINT "PRESS ANY KEY TO RETURN TO MENU": PAUSE 0: GO TO 140
  240 CLS : PRINT "NOTE LENGTH": PRINT "***********": PRINT : PRINT "    NOTE LEN
GTH IS INDICATED BY L FOLLOWED BY A NUMBER": PRINT : PRINT "MOST NOTE LENGTHS WI
LL BE IN THERANGE 1 TO 32": PRINT : PRINT "L1 IS A WHOLE NOTE, L2 A HALF   NOTE
AND L4 A QUARTER NOTE": PRINT : PRINT "IF YOU DO NOT ENTER A VALUE FOR L THE COM
PUTER WILL ALLOCATE THEVALUE L4": PRINT : PRINT "L CAN BE MODIFIED BY (.) E.G.
  L2. = 1/2 + 1/4 NOTE = 3/4 NOTE": PRINT : PRINT "PRESS ANY KEY TO CONTINUE": PA
USE 0
  245 CLS : PRINT AT 0,6;"NOTE LENGTH VALUES";AT 1,6;"****************";AT 4,16
;"C ";AT 5,0;"A  = L1";AT 5,16;"B  = L2";AT 8,0;"C ";AT 8,16;"CE";AT 9,0;"D
= L
4";AT 9,16;"D  = L8";AT 12,0;"CF";AT 12,16;"CG";AT 13,0;"D  = L16";AT 13,16;"D
H
= L32";AT 16,0;"PRESS ANY KEY TO RETURN TO MENU": PAUSE 0: GO TO 140
  250 CLS : PRINT "NOTES": PRINT "*****": PRINT : PRINT "THE NOTES CAN BE REPRESE
NTED BY LETTERS AS SHOWN BELOW"
  260 PRINT AT 6,9;"C#";AT 6,12;"D#";AT 6,18;"F#";AT 6,21;"G#";AT 6,24;"A#"
  270 PRINT AT 7,9;"or";AT 7,12;"or";AT 7,18;"or";AT 7,21;"or";AT 7,24;"or"
  280 PRINT AT 8,9;"D-";AT 8,12;"E-";AT 8,18;"G-";AT 8,21;"A-";AT 8,24;"B-"
  290 PLOT 52,103: DRAW 168,0: PLOT 52,55: DRAW 168,0: FOR I=52 TO 220 STEP 24: P
LOT I,55: DRAW 0,48: NEXT I
  300 FOR I=9 TO 11: FOR J=9 TO 24 STEP 3: PRINT AT I,J;"■": NEXT J: NEXT I
  310 PRINT AT 13,8;"C";AT 13,11;"D";AT 13,14;"E";AT 13,17;"F";AT 13,20;"G";AT 13
,23;"A";AT 13,26;"B"
  320 PRINT AT 16,0;"SEQUENCES OF NOTES ARE ENTERED  BY LETTER E.G. GGACDBE";AT 1
9,0;"   PRESS ANY KEY TO CONTINUE": PAUSE 0
  325 CLS : PRINT AT 0,0;"THE POSITION OF THE NOTES ON    THE STAFF WHEN WRITTEN
IN THE   KEY OF ""G"" IS AS SHOWN BELOW": PRINT AT 5,23;"G";AT 6,0;"------------
---------F----------";AT 7,19;"E";AT 8,0;"-----------------D--------------";AT 9
```

```
,15;"C (04)";AT 10,0;"-------------B-----------------";AT 11,11;"A";AT 12,0;"--
-------G--------------------";AT 13,7;"F";AT 14,0;"-----E-------------------
----";AT 15,3;"D";AT 16,0;"-C-(03) MIDDLE ""C""";AT 20,0;"PRESS ANY KEY TO RETUR
N TO MENU": PAUSE 0: GO TO 140
 330 CLS : PRINT "OCTAVES": PRINT "*******": PRINT : PRINT "OCTAVES ARE INDICATE
D BY THE    LETTER O FOLLOWED BY A NUMBER": PRINT : PRINT "THERE IS A RANGE OF F
IVE OCTAVES": PRINT : PRINT "1 IS LOW  5 IS HIGH": PRINT : PRINT "MIDDLE C IS AT
 THE START OF THE THIRD OCTAVE": PRINT : PRINT "TO PLAY THE SCALE IN C YOU WOULD
": PRINT : PRINT "ENTER T203CDEFGAB04CC03BAGFEDC": PRINT : PRINT "PRESS ANY KEY
TO RETURN TO MENU": PAUSE 0: GO TO 140
 340 CLS : PRINT "MODIFIERS": PRINT "*********": PRINT : PRINT "THE NOTES CAN BE
 MODIFIED BY    # TO INDICATE SHARP AND BY - TO INDICATE FLAT": PRINT : PRINT "T
, O AND L CAN BE MODIFIED BY   THE FOLLOWING SUFFIXES": PRINT : PRINT "+ INCREAS
ES CURRENT VALUE BY 1": PRINT : PRINT "- DECREASES CURRENT VALUE BY 1": PRINT :
PRINT "> DOULES CURRENT VALUE": PRINT : PRINT "< HALVES CURRENT VALUE": PRINT :
PRINT ". INCREASES NOTE LENGTH BY HALF": PRINT : PRINT "PRESS ANY KEY TO RETURN
TO MENU": PAUSE 0: GO TO 140
 350 CLS : PRINT "PAUSES": PRINT "******": PRINT : PRINT "PAUSES ARE INDICATED B
Y LETTER  P FOLLOWED BY A NUMBER": PRINT : PRINT "VALUES OF P ABOVE 26 PRODUCE T
HESAME LENGTH OF DELAY": PRINT : PRINT "THE PAUSE HAS THE SAME VALUES ASTHE NOTE
 LENGTHS E.G. P4 WOULD  BE A PAUSE LASTING FOR THE SAME LENGTH AS A QUARTER NOTE
": PRINT : PRINT "THE . MODIFIER CAN NOT BE USED  WITH THE PAUSE.  TO PAUSE L2.
  YOU WOULD USE P2P4": PRINT : PRINT "   PRESSANY KEY TO CONTINUE": PAUSE 0
 355 CLS : PRINT AT 0,6;"PAUSE LENGTH VALUES";AT 1,6;"******************";AT 5,
0;"I  = P1";AT 5,16;"J  = P2";AT 8,0;"O";AT 9,0;"P  = P4";AT 8,16;"K";AT 9,16;
"L
  = P8";AT 12,0;"M";AT 13,0;"L  = P16";AT 12,16;"M";AT 13,16;"N  = P32";AT 16,
0;
"PRESS ANY KEY TO RETURN TO MENU": PAUSE 0: GO TO 140
 360 CLS : PRINT "WRITING OR TRANSCRIBING MUSIC": PRINT "**********************
******": PRINT "HAVING READ THE INSTRUCTIONS YOUSHOULD NOW TRY ENTERING A TUNE.
FOR YOUR FIRST ATTEMPT TRY THE  EXAMPLE BELOW.": PRINT : PRINT "T403L2GB04CDL4CO
3BAGL2ADDL1A03L2GB04CDL4C03BAGL2ADDL1GL2BGG04C03L4BAGF#L2ADDL1A03L2GB04CDL4C03BA
GL2ADDL1G": PRINT : PRINT "NOW TRY YOUR OWN TUNE"
 361 PRINT AT 14,0;"      C      C      CE     CF      ";AT 15,0;"A =L1 B =L2 D =
L4
D =L8 D =L16 ";AT 17,0;"                O      K      M      ";AT 18,0;"I =P1 J =P2 P
 =
P4 L =P8 L =P16 ": INPUT " ENTER YOUR TUNE STRING PLEASE  "; LINE A$: LET N=1
 370 IF A$( TO N)="T" THEN  GO TO 390
 380 IF A$( TO N)<>"T" THEN  LET A$="T2"+A$: LET N=3: GO TO 410
 390 IF CODE A$(N+1 TO N+1)>=48 AND CODE A$(N+1 TO N+1)<=57 THEN  LET N=N+1: GO
TO 390
 400 LET N=N+1
 410 IF A$(N TO N)<>"O" THEN  LET A$=A$( TO N-1)+"O2"+A$(N TO ): LET N=N+2: GO T
O 430
 420 IF A$(N TO N)="O" THEN  LET N=N+2
 430 IF A$(N TO N)<>"L" THEN  LET A$=A$( TO N-1)+"L4"+A$(N TO )
 440 CLS : PRINT "A$ NOW = ";A$
 450 PRINT "TO PLAY YOUR TUNE USE THE       FOLLOWING SPECTRUM BEEPS": PRINT
 460 LET A$=A$+"S   "
 470 DIM H(LEN A$): DIM J(LEN A$): LET K=1
 480 FOR N=1 TO LEN A$
 490 IF A$(N TO N)="S" THEN  PRINT : PRINT "THE TUNE WILL NOW BE PLAYED AT  THE
CORRECT SPEED, THEN LISTED": GO TO 1200
 500 IF A$(N TO N)=";" OR A$(N TO N)="." OR A$(N TO N)="+" OR A$(N TO N)="-" OR
A$(N TO N)="<" OR A$(N TO N)=">" OR A$(N TO N)="#" THEN  NEXT N
 510 IF CODE A$(N TO N)>=48 AND CODE A$(N TO N)<=57 THEN  NEXT N
 520 IF A$(N TO N)="T" THEN  GO SUB 590
 530 IF A$(N TO N)="O" THEN  GO SUB 710
 540 IF A$(N TO N)="L" THEN  GO SUB 820
 550 IF A$(N TO N)="A" OR A$(N TO N)="B" OR A$(N TO N)="C" OR A$(N TO N)="D" OR
A$(N TO N)="E" OR A$(N TO N)="F" OR A$(N TO N)="G" THEN  GO SUB 940
 560 IF A$(N TO N)="P" THEN  GO SUB 1100
 570 IF A$(N TO N)="V" THEN  NEXT N
 580 NEXT N
 590 IF CODE A$(N+1 TO N+1)>=48 AND CODE A$(N+1 TO N+1)<=57 THEN  LET X=VAL A$(N
```

```
+1 TO N+1)
 600 IF CODE A$(N+1 TO N+1)<48 OR CODE A$(N+1 TO N+1)>57 THEN  GO TO 650
 610 IF CODE A$(N+2 TO N+2)>=48 AND CODE A$(N+2 TO N+2)<=57 THEN  LET X=10*X+VAL
 A$(N+2 TO N+2)
 620 IF CODE A$(N+2 TO N+2)<48 OR CODE A$(N+2 TO N+2)>57 THEN  GO TO 650
 630 IF CODE A$(N+3 TO N+3)<48 OR CODE A$(N+3 TO N+3)>57 THEN  GO TO 650
 640 IF CODE A$(N+3 TO N+3)>=48 AND CODE A$(N+3 TO N+3)<=57 THEN  LET X=10*X+VAL
 A$(N+3 TO N+3)
 650 IF A$(N+1 TO N+1)="+" THEN  LET X=X+1
 660 IF A$(N+1 TO N+1)="-" THEN  LET X=X-1
 670 IF A$(N+1 TO N+1)=">" THEN  LET X=2*X
 680 IF A$(N+1 TO N+1)="<" THEN  LET X=X/2
 690 LET T=2/X
 700 RETURN
 710 IF CODE A$(N+1 TO N+1)>=48 AND CODE A$(N+1 TO N+1)<=57 THEN  LET Y=VAL A$(N
+1 TO N+1)
 720 IF A$(N+1 TO N+1)="+" THEN  LET Y=Y+1
 730 IF A$(N+1 TO N+1)="-" THEN  LET Y=Y-1
 740 IF A$(N+1 TO N+1)=">" THEN  LET Y=2*Y
 750 IF A$(N+1 TO N+1)="<" THEN  LET Y=Y/2
 760 IF Y=1 THEN  LET S=-25
 770 IF Y=2 THEN  LET S=-13
 780 IF Y=3 THEN  LET S=-1
 790 IF Y=4 THEN  LET S=11
 800 IF Y=5 THEN  LET S=23
 810 RETURN
 820 IF CODE A$(N+1 TO N+1)>=48 AND CODE A$(N+1 TO N+1)<=57 THEN  LET Z=VAL A$(N
+1 TO N+1)
 830 IF A$(N+2 TO N+2)="." THEN  LET Z=(2*Z)/3
 840 IF CODE A$(N+2 TO N+2)>=48 AND CODE A$(N+2 TO N+2)<=57 THEN  LET Z=10*Z+VAL
 A$(N+2 TO N+2)
 850 IF A$(N+3 TO N+3)="." THEN  LET Z=(2*Z)/3
 860 IF CODE A$(N+3 TO N+3)>=48 AND CODE A$(N+3 TO N+3)<=57 THEN  LET Z=10*Z+VAL
 A$(N+3 TO N+3)
 870 IF A$(N+4 TO N+4)="." THEN  LET Z=(2*Z)/3
 880 IF A$(N+1 TO N+1)="+" THEN  LET Z=Z+1
 890 IF A$(N+1 TO N+1)="-" THEN  LET Z=Z-1
 900 IF A$(N+1 TO N+1)=">" THEN  LET Z=2*Z
 910 IF A$(N+1 TO N+1)="<" THEN  LET Z=Z/2
 920 LET L=1/Z
 930 RETURN
 940 IF A$(N TO N)="C" THEN  LET W=1
 950 IF A$(N TO N)="D" THEN  LET W=3
 960 IF A$(N TO N)="E" THEN  LET W=5
 970 IF A$(N TO N)="F" THEN  LET W=6
 980 IF A$(N TO N)="G" THEN  LET W=8
 990 IF A$(N TO N)="A" THEN  LET W=10
1000 IF A$(N TO N)="B" THEN  LET W=12
1010 IF A$(N+1 TO N+1)="#" THEN  LET W=W+1
1020 IF A$(N+1 TO N+1)="-" THEN  LET W=W-1
1030 LET DURATION=INT (1000*(T*L+0.0005))/1000
1040 LET PITCH=S+W
1050 LET H(K)=DURATION: LET J(K)=PITCH
1060 PRINT "BEEP ";DURATION;",";PITCH;" : ";
1070 BEEP DURATION,PITCH
1080 LET K=K+1
1090 RETURN
1100 IF CODE A$(N+1 TO N+1)>=48 AND CODE A$(N+1 TO N+1)<=57 THEN  LET U=VAL A$(N
+1 TO N+1)
1110 IF CODE A$(N+2 TO N+2)<48 OR CODE A$(N+2 TO N+2)>57 THEN  GO TO 1150
1120 IF CODE A$(N+2 TO N+2)>=48 AND CODE A$(N+2 TO N+2)<=57 THEN  LET U=10*U+VAL
 A$(N+2 TO N+2)
1130 IF CODE A$(N+3 TO N+3)<48 OR CODE A$(N+3 TO N+3)>57 THEN  GO TO 1150
1140 IF CODE A$(N+3 TO N+3)>=48 AND CODE A$(N+3 TO N+3)<=57 THEN  LET U=10*U+VAL
 A$(N+3 TO N+3)
1150 LET PAUSE=INT ((50*T)/U)
1160 IF PAUSE<1 THEN  LET PAUSE=1
```



Please note: All Spectrum listings in HCW are printed to a special format. All user defined characters are printed as capital letters but with an underline. In order to type them into your computer you need to place the machine in GRAPHIC mode and then press the capital letter indicated. If you follow these instructions to the letter the graphic characters will be shown on screen when you run the program.



```
1170 PRINT "PAUSE ";PAUSE;" : ";
1180 LET H(K)=0: LET J(K)=PAUSE: LET K=K+1
1190 RETURN
1200 FOR I=1 TO K-1
1210 IF H(I)=0 THEN  PAUSE J(I): NEXT I
1220 BEEP H(I),J(I)
1230 NEXT I
1240 CLS : PRINT "TO INCLUDE YOUR TUNE IN PROGRAM TYPE (LINE No) ";
1250 FOR I=1 TO K-1
1260 IF H(I)=0 THEN  PRINT "PAUSE ";J(I);" : ";: NEXT I
1270 PRINT "BEEP ";H(I);",";J(I);" : ";
1280 NEXT I
1290 PRINT TAB 0;"PRESS ""M"" FOR RETURN TO MENU,   PRESS ""P"" TO PLAY AGAIN AN
D LIST"
1300 IF INKEY$="" THEN  GO TO 1300
1310 IF INKEY$="M" THEN  GO TO 140
1320 IF INKEY$="P" THEN  GO TO 1200
1330 GO TO 1300
1340 REM PROGRAM TO CONVERT THE DRAGON COMPUTER SOUND COMMAND TOSPECTRUM BEEPS.
  BY R.A.HOULTONMARCH 1984 UPDATED NOVEMBER 1984_____________________________
1350 CLS : PRINT : PRINT "    THE DRAGON SOUND COMMAND IS VERY SIMILAR TO THE SP
ECTRUM    BEEP COMMAND AND CAN BE COPIED  BY THIS PROGRAM"
1360 PRINT "THE SOUND COMMAND HAS THE FORM": PRINT : PRINT "SOUND P,D": PRINT :
PRINT "RANGE OF P 1(LOW) TO 255(HIGH)": PRINT "(MIDDLE C = 90)": PRINT : PRINT "
RANGE OF D 1(SHORT) TO 255(LONG)": PRINT "(1 SECOND = 16)": PRINT : PRINT "PLEAS
E ENTER P AND D"
1370 INPUT "P FIRST PLEASE ";P: IF P<1 OR P>255 THEN  GO TO 1370
1380 INPUT "AND NOW D ";D: IF D<1 OR D>255 THEN  GO TO 1380
1390 LET PITCH=INT (P/3)-30: LET E=D: IF E>160 THEN  LET E=160
1400 LET DURATION=INT ((E/16)*1000+0.0005)/1000
1410 PRINT : PRINT "FOR SOUND ";P;",";D: PRINT : PRINT "USE BEEP ";DURATION;",";
PITCH
1420 PRINT : PRINT "TO HEAR SOUND PRESS ANY KEY": PAUSE 0: BEEP DURATION,PITCH
1430 PRINT : PRINT "FOR ANOTHER SOUND PRESS S": PRINT : PRINT "ANY OTHER KEY TO
RETURN TO MENU"
1440 IF INKEY$="" THEN  GO TO 1440
1450 IF INKEY$="S" OR INKEY$="s" THEN  GO TO 1350
1460 RESTORE 1500: GO TO 10
1470 FOR I=USR "A" TO USR "P"+7
1480 READ A: POKE I,A
1490 NEXT I
1500 DATA 0,60,66,129,129,66,60,0
1510 DATA 1,61,67,129,129,66,60,0
1520 DATA 1,1,1,1,1,1,1,1
1530 DATA 1,61,127,255,255,126,60,0
1540 DATA 128,64,32,16,0,0,0,0
1550 DATA 128,64,32,144,64,32,16,0
1560 DATA 128,64,32,144,64,32,144,64
1570 DATA 32,16,0,0,0,0,0,0
1580 DATA 0,0,255,60,60,0,0,0
1590 DATA 0,0,60,60,255,0,0,0
1600 DATA 58,58,60,4,4,8,8,8
1610 DATA 8,16,16,16,16,32,32,32
1620 DATA 58,58,60,4,116,120,120,8
1630 DATA 232,240,240,16,16,32,32,32
1640 DATA 64,32,16,8,4,6,15,30
1650 DATA 60,248,112,32,112,248,252,132
1660 RETURN
1665 REM (Enter lines 1680 and       1700 in ordinary capitals       lines 1690
and 1710 in          graphics<CAP SHIFT>+<9>.)
1670 REM GRAPHICS CHARACTERS
1680 REM A B C D E F G H I J K L
1690 REM A B C D E F G H I J K L
1700 REM M N O P
1710 REM M N O P
Type UDG'S J as G J
```





C5 program

I thought that some of the readers of your excellent magazine would be interested in this program, which I have written for the C5 micro carputer. It innovates all the msot useful items included in this excellent vehicle/state-board which Sir Clive has introduced to endanger the lives of all those unfortunate enough to have purchased one of these toys.

```
10 LET SPEED=0
20 LET WEIGHT=50
30 IF IKEY$ = "KEY
   INSERTED" THEN
   GOTO 50
40 GOTO 30
50 IF INKEY$="ACCEL-
   ERATOR ON" THEN
   GOTO 70
60 GOTO 50
70 LET SPEED=SPEED+1
80 PRINT SPEED
90 LET DISTANCE = DIS-
   TANCE + SPEED
100 IF DISTANCE > 10
   THEN PRINT "YOU
   HAVE TRAVELLED
   OVER HALF THE
   DISTANCE"
110 IF DISTANCE = 20
   THEN GOTO 140
120 IF SPEED = 15 THEN
   GOTO 80
130 GOTO 50
140 LET SPEED = 0
150 PRINT "OUT OF POW-
   ER"
160 IF INKEY$ = "BAT-
   TERY RECHARGED"
   THEN GOTO 10
170 PAUSE HALF AN
   HOUR
180 GOTO 160
```

On another tack, why must you publish so many TI-99/4A owners' letters? In issue 100 there were five TI letters out of a total of eight leters. Don't you think we other users get a bit bored of reading how "good" the TI is and how bad the other computers are?

M Graham, Congleton

Indiana moans

I am writing to express my views on US Gold's Indiana Jones in the Lost Kingdom. US Gold's software is usually first class, but this one is a long way from their normal standard.

The game offers six — don't swoon at this large amount — screens, all of which are poor and offer only limited graphics. Indy himself waddles like a duck and is extremely difficult to move.

I only hope that if people want to buy it it's because of the game and not the Indiana Jones' connection. Having said all this, the tune which is played is Indy's theme tune, and that at least is very nicely done.

T Simcox, Allenton

...and another

I am writing with reference to Andrew Musgrove's letter about Match Day, by Ocean. I have managed to thrash the computer 9-0 at amateur level and 7-0 at both professional and international level, five minutes each half.

There are two bugs I've noticed. Firstly, when the players come on the pitch (close-up shot) the pitch is green. If you change the pitch colour and start up a new match the close-up shows the pitch still green.

Also, when the clock is just turning to 90, kick the ball off the field. If you do it just right you should get an extra 55 minutes.

Neil MacLennan, Canvey Island

Problems, problems

Help! I have recently bought Daley Thompson's Decathlon. It's a very good game when it works.

I went down to my local stockist with my £7, all ready to buy Decathlon. In the shops were several copies, but would any of them work? No. Not one copy would load, or if the first side loaded the second side wouldn't. After attempting three or four copies I gave up and went to another store. Again I tried several copies but they wouldn't work either. I tried one last copy, and it worked, both sides.

I bought it straight away and rushed home to try it. It didn't work. I tried several times until it worked. Now every time I want to play it I have to load it several times before I can get it to work, and then sometimes side two doesn't work. My friends also have the same trouble.

Paul Chatwin, Broadstairs

Match Day winner...

Andrew Musgrove (HCW 100) wanted to know if anyone had thrashed the computer on Match Day. I can proudly boast that I have — with a 5-1 victory on the international level being my best result — but I've also scored eight goals on the amateur level.

I quite agree with Andrew's comments and any football fan should buy this program, which is the best sports simulation I've seen.

Paul Grant, Northampton

Sharpen up

Here are some corrections to Blow away, for the Texas, printed in HCW 100. These corrections mean that the music is no longer flat.

Line 600 should read: CALL SOUND (600,523,0)
Line 650: CALL SOUND (300,466,0)
Line 660: CALL SOUND (300,466,0)
Line 880: CALL SOUND (600,523,0)
Line 930: CALL SOUND (300,466,0)
LIne 940: CALL SOUND (300,466,0)
Line 970: CALL SOUND (600,392,0)

L S Goldman, Wirral

LETTERS PAGE

TOP 20

Compiled by Gallup

SOFTWARE

Week Ending March 5, 1985

LAST WEEK	MOVE	THIS WEEK	TITLE	PUBLISHER	SPECTRUM	CBM 64	BBC	ELECTRON	VIC 20	AMSTRAD	ATARI	OTHERS
1	▲	1	Football Manager	Addictive Games	●	●	●	●				●
N/E	□	2	Soft Aid	Various	●	●						
26	▲	3	Impossible Mission	CBS		●						
3	▼	4	Raid over Moscow	US Gold	●	●						
1	▼	5	Alien 8	Ultimate	●							
30	▲	6	Everyone's a Wally	Mikro-Gen	●							
2	▼	7	Ghostbusters	Activision	●	●						●
N/E	□	8	Pole Position	Atari	●	●	●	●			●	
5	▼	9	Booty	Firebird	●	●						
14	▲	10	Blockbusters	Macsen	●	●	●	●				
28	▲	11	Fighter Pilot	Digital Integration	●	●					●	●
6	▼	12	Daley Thompson's Decathlon	Ocean	●	●						
11	▼	13	Technician Ted	Hewson	●						●	
8	▼	14	Combat Lynx	Durell	●	●	●	●			●	
9	▼	15	Manic Miner	Software Projects	●	●	●				●	
35	▲	16	Castle Quest	Micro Power	●		●					●
13	▼	17	Zaxxon	US Gold	●	●	●				●	●
38	▲	18	Finders Keepers	Mastertronic	●							
10	▼	19	Elite	Acornsoft			●	●				
16	▲	20	Brian Bloodaxe	The Edge	●						●	

Up and Coming

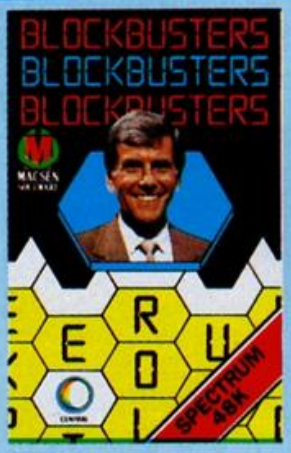
Great news this week, Soft Aid has entered the chart at number two! Now anyone who hasn't yet bought a copy, get your pocket money together and buy it next week.

The only other top 20 entry is Pole Position, a good game although it seems rather a surprise that it should jump so high at this stage in its life.

Under the top 20 there are a number of changes this week. Highest climber is the unlucky Dukes of Hazzard which jumps in at number 21.

Other new entries include Sorcery, Sam Stoat Safe-breaker, Project Future and Buck Rogers. The big names still seem to be drawing the sales. No fewer than a fifth of the top 50 are games based on TV, books or films.

Both the Spectrum and C64 charts show a number of changes this week. The Spectrum top 10 is most interesting with only four programs staying from last week. C64 owners have also had a change of game with three new entries.



SPECTRUM Top Ten

1	Alien 8	Ultimate
2	Raid over Moscow	US Gold
3	Everyone's a Wally	Mikro-Gen
4	Soft Aid	Various
5	Finders Keepers	Mastertronic
6	Booty	Firebird
7	Brian Bloodaxe	The Edge
8	Dukes of Hazzard	Elite
9	Daley Thompson's Decathlon	Ocean
10	Technician Ted	Hewson Consultants

BBC Top Ten

1	Castle Quest	Micro Power
2	Blockbusters	Macsen
3	Elite	Acornsoft
4	Football Manager	Addictive
5	Manic Miner	Software Projects
6	Mini Office	Database
7	Eddie Kidd Jump Challenge	Martech
8	Sabre Wulf	Ultimate
9	Combat Lynx	Durell
10	Chuckie Egg	A & F

COMMODORE Top Ten

1	Impossible Mission	CBS
2	Pole Position	US Gold
3	Soft Aid	Various
4	Ghostbusters	Activision
5	Booty	Firebird
6	Slap Shot	Anirog
7	Frak!	Statesoft
8	Combat Lynx	Durell
9	Raid over Moscow	US Gold
10	Buck Rogers	US Gold

Compiled by Gallup for the industry's weekly trade magazine, Computer and Software Retailing
For details contact John Sorrenti, Computer and Software Retailing, No. 1 Golden Square, London W1R 3AB 01 437 0626

FAME GAME

Fame and fortune, plus super software could await you in our System 3 Competition



If you've ever had a brilliant idea for a game but haven't got the programming skills to make it reality then you could now be in with a chance to see your creation on screen, in our game designer competition.

There will be 110 winners who will all receive prizes from System 3 Software. The top 10 winners will receive three games: Juice, Motocross and Suicide Strike, all for the C64. The 100 runners up will get Suicide Strike or Death Star Interceptor on the Spectrum. Each game would cost £7.95. In addition all entries will be considered by System 3 for possible development into commercial software.

To enter, just send us your idea for an arcade game or an arcventure. You can choose your own characters and settings and base your idea on any theme you like. Try and make it as original as possible. It can be funny, hair raising or just plain exciting but it must have the potential to be transformed into a really addictive game.

Explain your idea, in not more than 200 words — typed if possible — and give as much detail as you can. We would also like to see your idea illustrated on a story board. Don't worry if you're not very artistic, all we need are some basic pictures of your screen designs and characters.

The competition will be marked by System 3 Software and copyright on all entries will pass to System 3 and Argus Specialist Publications. System 3 Software will have the option to develop any of the entries into commercial software and will negotiate royalties with the authors concerned.

So, if you're aiming for fame and fortune, it could start here. Go away and look for inspiration!

How to enter

When you've thought of your game idea explain it in as much detail as possible but in nor more than 200 words. If you can type, then please send your entry typed. If not make sure your handwriting is very clear and neat.

If you decide to illustrate your entry then make sure your pictures are very clear. They need **not** be works of art, just neatly drawn diagrams. You can also include ideas for colour and sound. It is not essential to send illustrations but it would be very helpful to the judges.

Post your entry to: System 3 Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Entries close on first post on Friday 5th April, 1985.

You may enter as many times as you wish, but you must use an official entry coupon every time.

Important: please follow carefully the guidelines on entering — incomplete coupons cannot be considered. If you are a winner, the coupon will be used as a label, so clear writing is essential. Attach your entry coupon **firmly** to your game design and story. Coupons and designs which get separated cannot be judged.

The rules

Entries will not be accepted from employees of Argus Specialist Publications, System 3 Software, and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies.

Copyright to all entries will go to System 3 Software and Argus Specialist publications jointly. System 3 Software will negotiate royalties with the authors of any programs to be sold commercially.

The judge's decision is final and no correspondance will be entered into.

All entries **must** be original.

The How to Enter section forms part of the rules.

System 3 Competition

Entry Coupon

Name _____

Address _____

_____

_____

_____ **post code** _____

Type of computer (C64/Spectrum) _____

My game title is _____

Complete clearly and fully — if you are a winner this coupon will act as a label for your prize. Post to System 3 Competition, Home Computing Weekly, No.1 Golden Square, London W1R 3AB. Closing date: first post, Friday 5 April, 1985. Don't forget to follow closely the advice in the How to Enter section. Attach this coupon securely to your design.

HOME COMPUTING WEEKLY CLASSIFIED

Lineage:
35p per word

Semi display: £7.10 per single column centimetre
Ring for information on series bookings discounts.

All advertisements in this section must be prepaid.
Advertisements are accepted subject to the terms and conditions printed on the advertisement rate card (available on request).

01-437 0699 EXT 322.

Send your requirements to:
Becki Wilson
ASP LTD.
1 Golden Square,
London W1R 3AB

Courses

COMPUTING AND COMPUTING/SAILING COURSES

Weekly Courses for Adults and Children
Beginners and Intermediates
April — September

Newton Ferrers Sailing School, Newton Ferrers, South Devon. Tel: (0752) 872375

Duplication

jbs records
COMPUTER PROGRAMS

REAL-TIME or (Slow) HIGH-SPEED Professional Cassette Duplication and Blanks 1 - 1000+. Computer printed Cassette Labels. BBC Disk Duplication and Unformatted Disks 1 - 500+. Fast security delivery service.

jbs records — a division of FILTERBOND LTD, 19 Sadlers Way, Hertford SG14 2DZ 0992-551188

Exchanges

Commodore 64 hardware and software, cost over £300 sell cheap or exchange for modem or disc drive etc. Tel: 0482 833202

For Hire

ORIC, ATMOS, COMMODORE 64, LYNX SOFTWARE LIBRARY
Over 150 Oric and 200 Commodore 64 titles.
Stamp for details:-
Les Wilson 100 Blenheim Walk, Corby, Northants.

To hire a computer from Spectrum 48K upwards, please phone or write to Business & Computer Services, 294a, Caledonian Rd., London N1 1BA Tel. 01 607 0157

SPECTRUM SOFTWARE HIRE
FREE MEMBERSHIP
All top titles, for hire details send S.A.E. to:-
S.S.H. (HCW), 21 Chaceley Way, Wilford, Nottingham NG11 7EG

For Sale

M. BASIC COMPILER with integrated Assembler for Commodore 64. Features procedures Sound Graphics 3 levels of expressions. Send cheque/P.O. for £12 or £12.60 C.O.D. Tidal Software, 10 Hawkshead Street, Southport, Merseyside PR9 9HF

Hardware

CBM 64 VIC-20
TAPE TRANSFER — DUAL CASSETTE INTERFACE

It is quick and easy to transfer any cassette program with TRIGSOFT's DCL 1 interface. Duplicates all turbos, m/code, data files etc. If a program can be loaded it will be transferred exactly on a second datasette. Send £10.00 inc p&p to: **Trigsoft, Marshfield House, 4 Burnett Place, Bradford BD5 9LX**
7 day money back guarantee
If not 100% satisfied

BBC B musicians! Drum/Bassline hardware attachment. S.A.E. for details. Rice Computer Electronics, PO Box 2, Morecambe LA4 4PP

BOOK THIS SPACE NOW! RING 01-437-0699

Libraries

BBC B/Electron/Dragon software library — Membership £5.00. — Tapes 1 (+30p P&P). Stamp for details. E. Tucker, (H) 58, Blenheim Walk, Corby, Northants.

Software Educational

Help with your A-Level Physics! Improve your grades with examination revision program by former university lecturer. 48K Spectrum version £5.95. Cheques/POs to: Dr J C Hughes, 50 Leach Lane, St Helens, Merseyside WA9 4PU

TI-99/4A Software

TEXAS TI99/4A

Pacti — TI BASIC £2.95

MOONSHUTTLE 5 2.95
ART ATTIC 2.95
GHOSTERS (eb) 3.95
orders p&p free — sae for list + free pen
Fawcett Software
61 HOWDALE RD. HULL

QT — TI BASIC £2.95

TEXAS
SUPER SOFTWARE SAVERS

		WAS	NOW
Up to 50% OFF selected games guaranteed immediate and free delivery	★ RI-SKI	3.90	1.99
	★ HOT-WELLY	3.65	1.99
	★ BASHA-BUS	3.70	1.99
	★ NUCLR-PODS	4.25	1.99
	★ MAGGOT-MCH	3.90	1.99
	★ CASINO	3.95	1.99
	★★ HOP-IT	5.95	2.99
	★★ TORPEDO	4.60	2.99
	★★ MINI-KONG	4.65	2.99

★ BASIC/UNEXPANDED ★★ EXT BASIC
For full details send large SAE for free catalogue. Cheques or POs to:
MICRO-BYTE SOFTWARE, 11 SAINT MARYS AVENUE, PURLEY, READING, BERKSHIRE RG8 8BJ

ADVERTISE IN OUR NATIONWIDE GUIDE AND SEE YOUR BUSINESS GROW.

User Groups

TI-99/4A Nationwide User Group
Regular 60 page quarterly newsletter. £6 p.a. TI-99/4A Exchange, 40 Barrhill, Brighton BN1 8UF

Repairs 'n' Spares Register

THE COMPUTER HOSPITAL
SICK SPECTRUM SPECIALISTS
Send us your poorly patient well wrapped. We will diagnose, cure and return your friend 100% fit. £17.50 inclusive 48K upgrade £29.50 inclusive.
Invicta House, Station Road, Keyingham, Hull, HU12 9SZ
Tel 09644 3354 24 Hrs Ans

Commodore repairs. By Commodore approved engineers. Repair prices — VIC-20 modulators £6.50, VIC-20 from £14.50, CBM 64 from £18.00, C2N from £7.00, printers, disk, etc. For more details write or tel. G.C. Bunce & Son. 36 Burlington Road, Burnham, Bucks SL1 7BQ. Tel: (06286) 61696.

COMPUTER REPAIRS IN SOUTHEND
SPECTRUM, BBC, ELECTRON, CBM 64, VIC-20
MINNIE MICRO ELECTRONICS
12 Eastern Esplanade, Southend
Tel: 0702 62033/615809
Open 7 days a week

SINCLAIR COMPUTER REPAIRS
Fast reliable repairs by experienced engineers having serviced Sinclair computers since the introduction of the ZX80. Our price is inclusive of all parts, labour, postage and VAT, irrespective of fault.
*No hidden charges
*While-you-wait service available.
Spectrum £18.75.
ZX81 £11.50. 16K RAM £9.95.
Call or send with cheque or PO to
TV Services of Cambridge Ltd,
French's Road, Cambridge CB4 3NP.
Telephone (0223) 311371.

Now available **SPECTRUM XK MEMORY EXPANSION SYSTEM**
XK System Kit £15.95 inc VAT.
XK System Factory fitted £20.95 inc VAT.

MICRO-SERV
The home computer repair specialist in Scotland
BBC, SPECTRUM, VIC-20 AND ALL PERIPHERALS. 3 MONTH WARRANTY ON ALL REPAIRS
UNIT 4, Denny Workspace, Denny, Scotland, FK6 6DW.
Tel: Denny (0324) 823468

HEMEL COMPUTER CENTRE LTD.
For fast reliable repair service of your SPECTRUM, BBC, DRAGON, ATARI and COMMODORE computers. e.g. Send your 16/48K Spectrum to us and we will repair and return it for £20 + £1.60 p&p.
Hemel Computer Centre Ltd., 52 High St., Hemel Hempstead, Herts HP1 3AF.
Tel: 0442 212436

CLASSIFIED – RING 01-437 0699

The contents of this publication, including all articles, plans, drawings and programs and all copyright and all other intellectual property rights therein belong to Argus Specialist Publications Ltd. All rights conferred by the Law of Copyright and other intellectual property rights and by virtue of international copyright conventions are specifically reserved to Argus Specialist Publications Ltd and any reproduction requires the prior written consent of the company.
© 1985 Argus Specialist Publications Ltd.

SSN0264-4991

CLASSIFIED ADVERTISEMENT — ORDER FORM

1.	2.	3.
4.	5.	6.
7.	8.	9.
10.	11.	12.
13.	14.	15.

Please place my advert in Home Computing Weekly for weeks.
Please indicate number of insertions required.

ONLY 35p per word (minimum charge 15 words)

CLASSIFIED DEPT., HOME COMPUTING WEEKLY,
1 Golden Square, London W1R 3AB
Tel: 01-437 0699

Name .....

Address .....

.....

.....

Tel. No. (Day) .....

VISA

CLASSIFIED – RING 01-437 0699

TI-99/4A Cassette Software

STAINLESS SOFTWARE

Supporting UK TI owners for longer than any other software house!
More five star reviews in HCW than any other software house! 25 programs with 5 star reviews in current catalogue!!! including:
TRACTOR FOLLIES in Extended Basic for £6.00 Joystick & Extended Basic module required. Guide your tractor safely past the oncoming hazards.
FAST FROG plus NORBERT. Together for £7.00 Joystick and Extended Basic module required. Two arcade favorites in a bargain pack.
BUY ALL THREE ABOVE TITLES FOR ONLY £12.00!!

QUICKER QWERTY: Helps your fingers hit the right keys without looking. TI BASIC. £8.00

Many more programs in TI Basic & Extended Basic, games AND helpful utilities. Retain this advert: our advertising is now going into Summer recess! Modest packaging but great programs at a reasonable price.

MAIL ORDER ONLY
SEND A LARGE STAMPED SELF ADDRESSED ENVELOPE FOR AN ILLUSTRATED CATALOGUE
(Overseas send 4 International Reply Coupons) to:

STAINLESS SOFTWARE, (Proprietor: S Shaw)
10 Alstone Rd, STOCKPORT, Cheshire SK4 5AH

USER GROUP: TI*MES For £6.00 per year:
a quarterly magazine with over 60 pages in each issue, full of helpful information about YOUR TI99/4A Computer.
Published regularly! Send £6 (or S.A.E.) today to:
Clive Scally, 40 Barrhill, Patcham,
BRIGHTON, Sussex, BN1 8UF

HCW needs you

Have you ever looked at the articles and programs in HCW and thought you could have written that?

Why not try? We welcome submissions from readers and are always interested in your ideas and suggestions.

Submissions tend to fall into one of three categories...

Programs are always supplied on cassette and are accompanied by full details of the program variables. Please type these details double-spaced. Listings are helpful, but not essential. What is vital is that the programs should be completely error free, so please double check.

Articles on certain aspects of using home computers should be no longer than 1000 words. Try to keep to the style you see in HCW and include programming examples where they will help the reader understand the subject. We will convert your sketched illustrations into final artwork.

We also use **short** tips, articles and **brief** programming routines. Any discoveries you have made about your machine might be of interest to other readers.

All contributions are acknowledged and those accepted for publication are paid for at competitive rates. The copyright in such work will pass to Argus Specialist Publications Ltd. Keep a copy of your work and include a telephone number and an SAE. Please label everything clearly with your name and the machine concerned.

All contributions should be sent to:
Submissions
Home Computing Weekly
No.1 Golden Square London W1R 3AB

SAVE...SAVE...SAVE

DISCOUNT COMPUTERS AND SOFTWARE

BBC Model B + Cassette recorder + Five games	£385
Acorn Electron	£184
Sinclair Spectrum 48K + six games	£119.95
BBC Model B Disc Drive from	£149.50
Sinclair QL	£395

Prices include VAT & P&P.

DISCOUNT SOFTWARE FOR ATARI ★ BBC ★ CBM 64 ★ VIC-20 ★ SPECTRUM ★ ORIC 1 ★ TEXAS 99/4A

Send no money. For free list send SAE stating machine type to:

RAMTOPS 47 Broom Land, Levenshulme, Manchester M19 2TX or telephone 061-442 5603

Beat These Prices!

SPECTRUM		VIC-20	
Valhalla	£3.99	Skramble	£2.49
Great Space Race	£3.99	Bricks	£2.49
Hunter Killer	£3.99	Squish	£2.49
Match Day	£5.99	Reversie	£2.49
Tripods	£7.99	Terminal Invaders	£2.49
Alien	£7.99	Curse of the Weirwolf	£2.49
16K Value Pack (4 tapes)	£4.99	Get Lost	£2.49
48K Value Pack (6 tapes)	£4.99	Cops and Robbers	£2.49
Transylvannian Tower	All	Trader	£2.49
Ship of The Line	6 for	Harvester	£2.49
Invincible Island	£6.00	Pixel Power	£2.49
Devils of the Deep	or	Skyhawk	£2.49
Superspy	£1.50	Vixplod	£2.49
Everscent	each	Android Attack	£2.49
Manic Miner	£2.99	VIC-20 Value Pack (4 tapes)	£4.99
Boogaboo the Flea	£1.99		
The Grid Runner	£1.49		

Send cheque or postal order payable to **Recordmania,** 14 Daisygate Centre, York. Tel: 0904 339933. P&P is Free.
Please state alternatives and allow at least 7 days for delivery

READERS



Jonathan Barry climbs high



Readers' hi-score table

Name	Game	Machine	Score
Tim Prince	Underwurlde	Spectrum	74%
Stephen Foy	Headache	C64	2,644
	Zulu	C64	6,070
Theresa Taylor	Chuckie Egg	C64	270,125
Jonathan Barry	Corporate Climber	BBC	25

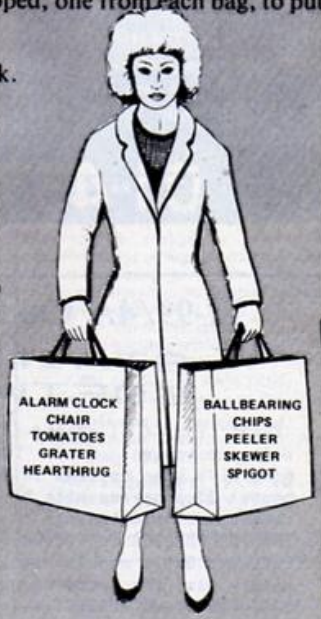
Puzzled? You will be

Ma Brewer's shopping bag contains some very odd items, a bit tough on the teeth for Saturday lunch! There is also something else unusual about her shopping.

In each bag four objects share something in common and the fifth is the odd one out and belongs in the other bag.

Which two items should be swapped, one from each bag, to put everything in order?

Answer and explanation next week.



M5's lament

Once upon a time not so long ago, there lived a computer, born in the land of Sord, doomed to wander the parallels of Z80 loneliness. M5, as it was called, was under the doomed hands of a barren monster named CGL, who failed dismally to help M5.

He wandered through homes far and wide, always misused. All he wanted was to be supported, but he was bludgeoned and thwarted by the house of software.

Now has come a bigger threat, named MSX, who has stolen every virtue that M5 ever had. Unless someone helps fast, M5 will sink further into the deep wastes of the rubbish bag to meet his end.

This is the opinion of J W Andrews and he's very anxious to save M5! He is now writing a book on this computer and welcomes information from any Sord M5 users.

Write to J W Andrew, 19 Canberra Towers, Weston Estate, Weston, Southampton SO2 9JT

Dead easy

Here are some useful POKEs for Ultimate's Underwurlde:

infinite lives — 50376,0 and 59380,0

immortality after finding gem — 38041,0 and 38042,0

keep weapons in same place — 59591,0.

Tim Prince, Hertfordshire

If you're an adventurer, then there's now a club just for you. Membership of the International Adventure Club costs £5 a year. You receive a plastic membership card, a helpline service and a quarterly newsletter.

Members can also receive special discounts on Gilsoft and Automata software and this may be extended to other companies soon.

The club caters for ZX81, Spectrum, BBC, Electron and many other computers.

The International Adventure Club, 10 Ennis Close, Harpenden, Herts AL5 1SS, Prestel: 582768663.

Helpline

Can anyone help David Tunwell? He needs a desk for his C64, but he's only got a small bedroom so the desk can't be more than 32½ inches long. Contact him at: 61 Edna Rd, Ringlestone, Maidstone, Kent ME14 2QN

Murray Hansen has a TRS 80 MC-10 computer and wishes to contact anyone with a similar machine to swap programs and ideas. If you're interested write to: Murray Hansen, 8 Goss Crescent, Kingscote, Kangaroo Island, Australia 5223.

If anyone's stuck on Pyjamarama then send an s.a.e. to Paul Owens, 6 Cae'r Berllan, Llangaffo Gaeruien, Gwynedd 1L60 6ND for the solution.

Mark Gourley of Hants has come to the aid of George MacRae of Blairgownie. A book on TI-99/4A machine code, entitled The Best of 99er, is available from Christine Computing, 6 Florence Close, Watford, Herts WD2 6AS (£14.95).

If any other readers have similar problems then write to us and maybe our helpline can help you.

READERS PAGE

THE FORCES OF LIGHT & DARK BATTLE IT OUT IN

ARCHON

THE ULTIMATE ACTION & STRATEGY PROGRAM FOR YOUR CBM 64

OUT NOW ON CASSETTE AND DISK

THE U.S. TOP TO HIT THAT BECAME A CULT



STAR GAME

ARCHON is brilliant. There's something in it for all games addicts; arcade, adventure and strategy are all here. My only complaint is that it's best played against a human opponent – the computer's just too good and you can't give it a handicap.

Bryan Skinner
Personal Computer News

INCLUDES SPECIAL DISCOUNT VOUCHER

PERSONAL COMPUTER NEWS HIT!

Features ● Play the computer or a friend ● Computer player gets tougher as you do ● 64 Battle combinations ● Separate battleground screen ● Medieval pieces like the wizard and the sorceress – magic spells and a board that changes as you play ● Deluxe boxed package includes full instruction and hints manual ● Joystick controlled

ariola

48K SINCLAIR ZX SPECTRUM



"ALIEN 8" recommended retail price £9.95 inc VAT
Available from W.H.SMITHS, BOOTS, J.MENZIES, WOOLWORTHS
and all good software retail outlets. Also available from
ULTIMATE PLAY THE GAME, The Green, Ashby-de-la-Zouch, Leicestershire LE6 5JU
(P&P included) Tel: 0530 411485