

POPULAR Computing WEEKLY

Only 40p.

26 July-1 August 1984

The best selling weekly

Vol3 No 30



Graham Clark

Major shake-up for Atari UK

THERE has been a major shake-up at Atari UK, just three weeks after the US parent was taken over by a company headed by ex-Commodore chief Jack Tramiel.

Atari UK's managing director Graham Clark has resigned, and many of the UK sales and management staff have been sacked.

Clark has been replaced, initially by Simon Westbrood, previously Atari UK's financial controller. He will remain as acting managing director until a successor can be found.

Tramiel resigned his position as president of Commodore in January this year, and since his dramatic purchase of Atari from Warner Communi-

cations, several key Commodore executives have joined Tramiel's organisation in the US.

The upheavals at Atari UK are seen as part of a strategy to streamline the loss-making company and sell Atari products through appointed distributors rather than through the company's own sales force.

Activision sues Microdeal

MICRODEAL, the Cornwall based software company which last week took two Blackburn brothers to court in a software piracy action, has itself been taken to court.

American company Activision instituted proceedings in the High Court on the grounds that Microdeal's *Cuthbert in the Jungle* is a copy of *Pitfall*. Activision claims that the consumer would be hard-pressed to distinguish between the two on the Commodore 64.

"We applied to the court for an injunction to prevent Microdeal selling *Cuthbert in the Jungle*," explained Geoff Heath, UK managing director of Activision. "However, after reviewing the writ and our prosecution papers, Microdeal obviously felt our case was watertight because they didn't fight it."

"They gave the court an undertaking that they would not reproduce, adapt or copy *Pitfall* in any form, and have written to suppliers to say that *Cuthbert in the Jungle* can no longer be sold."

"Our intention was to fight the case on the grounds of a breach of copyright. Happily it didn't come to that."

"We had been working on our approach to this case for some time, but obviously the

continued on page 5 ▶

INSIDE > HAIL CAESAR > EVIL DEAD > SECRETS ON 64 >



EMPIRES

**When a Galactic war breaks out,
there is only one winner —
make sure it's you!**

Empires is a game of the type which has not been seen before. It is a fully player interactive strategy game for up to six players and an umpire. The basic set contains three players. Expansion set one contains three more. Each player controls a unique race struggling to take over the galaxy. Mining companies, space fleets and sound strategy all contribute to the success of your race; but beware the other players will be trying to tear your empire apart. The skill required to organise your empire as it grows is enormous. To assist you galactic maps and data cards are provided. Soon further expansion sets will be available to give you an advantage over the other players. Move information is transferred via cassette to the umpire who analyses it with his program and returns the new data to the players. Messages can be sent to other players in the same way.

**THIS IS A NEW CONCEPT IN STRATEGY
GAME PLAYING.**

48K SPECTRUM

CONTENTS: · THREE PLAYER CASSETTES, ONE UMPIRE CASSETTE,
4 GALACTIC MAPS, 81 DATA CARDS, 1 FULL SET OF RULES, 3 PLAYER INSTRUCTIONS

Price £19.95.

Please send me copy/copies of Empires Basic Set

Total cheque/P.O. enclosed

Cheques payable to Imperial Software.

Now available from all leading branches of BOOTS

Name

Address

..... Age

Send order to:

IMPERIAL SOFTWARE

IMPERIAL HOUSE

153 CHURCHILL ROAD

PARKSTONE

POOLE

DORSET Tel: 0202-723060

Microdeal ought to be very embarrassed.

In the same week that it sought the protection of the High Court to halt the activities of a commercial piracy racket in Blackburn, it was itself on the receiving end of a court case brought by another software house, Activision.

Activision claimed that Microdeal's game *Cuthbert in the Jungle* was a copy of its own *Pitfall* game. Microdeal admitted it was in the wrong and has since given an undertaking that it will withdraw *Cuthbert*.

This is not the first time Microdeal has been caught out. Nintendo claimed last year that Microdeal's *Donkey Kong* game was a version of *Donkey Kong*. On that occasion Microdeal agreed to change the name of its game to *The King*.

Microdeal is by no means alone. It just isn't good enough for software houses to start kicking up a stink about piracy — forming themselves into groups, GOSH and FAST, with the aim of fighting piracy — when their own house is in such disorder.

Hardly a one of them doesn't have at least one skeleton in the closet. A *Pac-Man*, an *Asteroids* or *Scramble*. How many currently have a version of *Q-bert* in their catalogue? And when the Olympics arrive just wait and see how many *Track and Field* clones crawl out of the woodwork.

Suppose someone eventually succeeds in proving that software is copyright and/or a private members' Bill imposes substantial fines and possible imprisonment on offenders?

Who then will be first against the wall when the revolution comes?

They will.

>Presents...

News > Microdeal in dispute with Activision > Oric's Atmos goes up in price > CP/M on the QL

5

Star Game > *Deathcap* on Commodore 64: taste the mushrooms at your peril

10

Street Life > Christina Erskine meets the team at Triptych who are producing programs that make the computer work for its living

12

Software reviews > Interceptor go oriental with *Tales of the Arabian Nights* > Jeff Minter's *Megagalactic Llamas* are alive and spitting

16

Spectrum > Machine code adventuring, part three — input and string manipulation

20

The QL Page > a program to enable you to verify microdrive listings

23

Dragon > continues the Assembly language games writing series

24

BBC & Electron Second part of the machine code series to make defining graphics easier

28

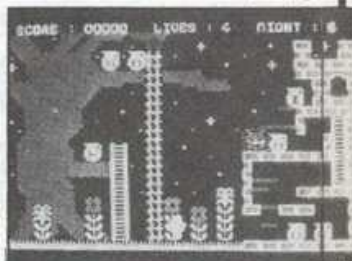
Commodore 64 > How to create unbreakable codes on your 64 — and how to break them!

31

New Releases > Arabic Abracadabras with Melbourne House's *Zim Zalabim* > and *Evil Dead* from Palace is Pick of the Week

48

Best of the rest > Letters 7 > Open Forum 34 > Arcade Avenue 35 > Microradio 37 > Adventure Corner 39 > Peek & Poke 41 > Diary 47 > Top 10, This Week 50 > Ziggurat, Puzzle, Hackers 51



>Futures...

How to get started with networking — let your micro do the walking... *Delta Queen* is the Spectrum Star Game piloting a Mississippi paddle steamer... and *Paintbox* on the BBC, a two part easy-to-use graphics utility.

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Production editor Lynne Constable Editorial secretary Geraldine Smyth Advertisement manager David Lake Assistant advertisement manager Alastair Macintosh Advertisement executive Tom Watson Classified executive Diane Davis Advertising production Lucinda Lee Administration Theresa Lacy Managing editor Duncan Scot Publishing director Jenny Ireland.

Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2R 3LD. Tel 01-437 4343 Telex 296275 Typeset by The Artwork Group, 55-63 Goswell Road, London EC1, in association with Ink on Paper Ltd Printed by East Midland Litho Printers Ltd, Oundle Road, Woodston, Peterborough PE2 9QR Distributed by S M Distribution, London SW9, tel 01-274 8611, telex 261643. © Sunshine Publications Ltd 1984.

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

ABC

ZX MICROFAIR

EVERYTHING FOR SINCLAIR COMPUTERS

THE GREATEST SHOW ON EARTH

ONCE AGAIN AT ALLY PALLY
SEPTEMBER 8th 1984

★ SPECIAL NOTICE TO EXHIBITORS ★

You know that the ZX Microfairs are the best value-for-money exhibitions and the next one at Ally Pally on the 8th September is no exception!

So why not make your booking well in time to assure yourself of a good position?

Needless to say it won't cost you an arm and a leg, in fact prices start at as little as £60!

One thing you can count on is a good day doing business with over 10,000 willing customers.

It's fun. It's profitable. It's all over in a day!

Contact Mike Johnston now by writing to:

ZX Microfairs, 71 Park Lane, London N17 0HG.

Or leave a message on our answering machine and we'll get back to you.



VISITORS! IF YOU WANT TO MAKE SURE OF YOUR PLACE IN THE QUEUE, SEND TODAY FOR REDUCED PRICE ADVANCE TICKETS!

Post today and you can have Advance tickets at £1 (Adults) and 50p (Kids). Please include a stamped addressed envelope with your reply and make cheques/PO's payable to ZX Microfair.

Name:

Address:

Please send me..... advance tickets @ £1.00

Please send me..... advance tickets @ £0.50p

Post to Mike Johnston, ZX Microfair, 71 Park Lane Tottenham, London N17 0HG.

EXHIBITORS! Phone Mike Johnston on 01-801 9172 for details and availability of stands at the show!

12th
ZX MICROFAIR
at Ally Pally on
8th September 1984

Quest develops CP/M system for QL

QL OWNERS should be able to run CP/M software on their machines.

Hampshire-based Quest Automation will be converting Digital Research's CP/M 68K operating system to run on the QL.

"It will, in effect, mean that all CP/M software will run on the QL," said Quest's Grant McKeown. "Although the system is written to run with the 68000 chip, there are a few changes that need to be made for the QL."

"We feel that this will provide the key for using the QL for business purposes."

CP/M 68K for the QL is planned to be available in October

priced at £49.50. Quest will also shortly be announcing hard and floppy disc drives for the QL as well as add-on memory for the machine. Details from Quest Automation, School Lane, Chandlers Ford, Hants.

● A joystick adaptor for the QL allowing any Atari-standard joystick to be connected is now available at £6.00 from Timedata, 16 Hemmells, Laindon, Essex.

Ivan Berg — Mirrorsoft tie-up

IVAN Berg Software has teamed up with Mirrorsoft to release a range of new titles for the Commodore 64, Spectrum, BBC and Electron machines in September.

These include *Know Your Psi-Q* — testing your psychic power and a no-diet weight control system designed by Professor Justin Joffe. Versions of *Know Your Personality* and *BBC Mastermind* will also be released on the Spectrum and BBC machines.

MSX versions of all the titles are planned through Mirrorsoft before Christmas.

Activision

continued from page 1



John Symes of Microdeal

release of *Pitfall* in Britain, and its conversion to the Commodore 64 has accelerated proceedings."

Microdeal's solicitor, Michael Drynan, confirmed that Activision had an open and shut case. "Microdeal obtained the license for the game from Tom Mix in the States in good faith. But when we compared our licence with Activision's, theirs appeared to have been agreed first, so we were happy to withdraw."

Activision will now be taking action against Tom Mix in the US, again on copyright grounds.

Microdeal has, however, been successful in its case against Dr Tariq Mohammed who with his brother, 14 year old Mohsan, copied Dragon games from Microdeal, among other companies, and sold them at much reduced prices. On Friday, July 20, it obtained a further injunction preventing Mohammed from copying and selling Microdeal's games. After the ruling, Microdeal has decided not to pursue a full trial.

Menzies opts for electronic software

TWO UK distribution companies are hoping to change the way you buy your software.

Program Express of Edinburgh and Micro Dealer UK have jointly launched a scheme to download software from 'retail modules' installed in individual shops.

Explained Neil Johnson, Micro Dealer's managing director. "Customers will first look at a menu on the unit's display to see which titles are available. When they have decided which they want, they buy a blank cassette, disc or cartridge and slot it into the machine. Twenty seconds later the software is downloaded into the cassette or whatever via the machine from a central host computer." The system is still under evaluation but Neil

hopes that the first such machines will be in the shops by October this year.

The cost of software bought from the system should be the same as a conventional cassette, cartridge or disc.

A similar system, Romox has been tried in the US but has yet to get a full-scale trial. Prism, which has the UK rights to Romox has yet to evaluate the system in the UK.

So the Program Express/Microdealer system could become the first operation of its kind to go on trial in this country. Already John Menzies has shown considerable interest. "We have ordered five machines," said managing director Robert Black. "It means we will be able to have a full range of software available to customers all the time, and will save a huge amount of storage space. We hope to have our first machines installed before Christmas."

Enterprise move

SINCE losing its exclusive distribution contract with Sinclair, Prism has gained the distribution rights for the new Enterprise computer as well as the Oric Atmos.

Prism will distribute the Enterprise through a national network of retailers and dealers, although Enterprise has retained a small number of accounts to supply direct.

First deliveries of the Enterprise are due in September.

Oric price increased

THE price of the Oric Atmos has been increased by almost £20 to £189.95. The company is blaming the dollar exchange rate for the increase.

"At present Oric is building up stock levels quickly in time for Christmas," explained an Oric spokesman. "But the strong dollar makes the price components high, and we have had to raise the price accordingly."

Oric announced record June sales of £2½m, largely taken up by £1½m sales to France, although Italian and German orders also increased. Only 30 per cent of this figure — about 4,500 units — went to the UK market.

The prices of Oric peripherals remain unchanged.



UP IN THE AIR. Virgin's new in-house programming team is to produce its first games for the Commodore 64 and Spectrum in September. The five-strong team is (left to right) Ian Mathias, Pat Mitchell, Dave Chapman, Andy Wilson and Steve Webb.

Rabbit bounces

RABBIT Software, best known for its Commodore games such as *Troopatruck*, has gone into liquidation.

The company had been in difficulties for some time following the death earlier this year of its founder Alan Savage.

Salamander

SOFTWARE



DRAGON 32/64 DRAGON TREK

Excellent version of this classic game

WIZARD WAR

Strategy game of magical combat

VULCAN NOUGHTS & CROSSES

3-D Tic-tac-toe

GAMES COMPENDIUM D1

Six games for all the family

GOLF

Almost as good as the real thing!

GRAND PRIX

Eight circuits from around the world

STARJAMMER

3-D space game

SALAMANDER GRAPHICS SYSTEM

Advanced picture drawing system

SUPER SKILL HANGMAN

Over 1000 word vocabulary

NIGHT FLIGHT

Single engine light aircraft simulator

GRIDRUNNER

Classic arcade game

FRANKLIN'S TOMB

First of the Dan Diamond Adventures

LOST IN SPACE

The Dan Diamond Adventure continues...

FISHY BUSINESS

Conclusion of the first Dan Diamond Trilogy

EVEREST

Strategic simulation

LASER ZONE

Awesome shoot 'em up stuff!

D.R.S.

Powerful Date Retrieval System

TURTLE GRAPHICS

Fun & Educational implementation of LOGO

THE CRICKLEWOOD INCIDENT

Truly weird and wonderful adventure

WINGS OF WAR

World War Two Adventure

RED MEANIES

Machine code 3-D maze game

ACORN ELECTRON

737 FLIGHT SIMULATOR

Professional standard

ELECTRON GRAPHICS SYSTEM

Advanced picture drawing system

GRAPHS

Five programs up to 'A' level standard

VECTORS

Fourteen programs up to 'A' level standard

TURBO COMPILER

Less than 2K machine code BASIC compiler

PRICE

9.95

9.95

7.95

7.95

7.95

7.95

7.95

9.95

7.95

7.95

7.95

9.95

9.95

9.95

7.95

7.95

14.95

9.95

7.95

7.95

7.95

PRICE

9.95

9.95

9.95

14.95

9.95

BBC MODEL B DRAGON RIDER

Flaming steeds and alien wyrms

TANKS!

Armoured warfare for two

GAMES COMPENDIUM B1

Four games for the kids

GAMES COMPENDIUM B3

Three action games for the kids

EDG GRAPHICS PACKAGE (tape)

Sophisticated picture drawing

EDG GRAPHICS PACKAGE (disc)

Extended version of EDG tape

UTILITIES PACKAGE

Four essential programming aids

TURBO COMPILER*

Less than 2K machine code BASIC compiler

737 FLIGHT SIMULATOR*

Professional standard

FRENCH TUTOR**

Up to and beyond 'O' level

GRAPHS**

Five programs up to 'A' level standard

VECTORS**

Fourteen programs up to 'A' level standard

FRANKLIN'S TOMB

First of the Dan Diamond Adventures

LOST IN SPACE

The Dan Diamond Adventure continues...

FISHY BUSINESS

Conclusion of the first Dan Diamond Trilogy

EAGLE

Original machine code arcade game

* DISC VERSIONS ALSO SUPPLIED

** MAY BE TRANSFERRED TO DISC

ORIC 1/ATMOS

ORIC TREK

Excellent version of this classic game

GAMES COMPENDIUM 01

Four exciting games

FRANKLIN'S TOMB

First of the Dan Diamond Adventures

LOST IN SPACE

The Dan Diamond Adventure continues...

FISHY BUSINESS

Conclusion of the first Dan Diamond Trilogy

CLASSIC RACING

A season's training, betting and racing

48K SPECTRUM

MATRIX

Action-packed droid-blasting

METAGALACTIC LLAMAS

All-out arachnid annihilation

PRICE

7.95

7.95

5.95

5.95

19.95

24.95

9.95

9.95

9.95

9.95

9.95

14.95

9.95

9.95

9.95

7.95

PRICE

9.95

7.95

9.95

9.95

9.95

7.95

PRICE

6.95

6.95



PURVEYORS OF FINE QUALITY SOFTWARE TO THE GENTRY SINCE 1882 1982

SAVE £1

If you return this voucher and order form you will be entitled to a £1 discount on the order. Only one discount per order. This offer applies only to products ordered by mail direct from Salamander Software. 17 NORFOLK ROAD, BRIGHTON, EAST SUSSEX. BN1 3AA. TELEPHONE: BRIGHTON (0273) 771942.

Name

Address

Post Code

PLEASE MAKE CHEQUES/POSTAL ORDERS PAYABLE TO SALAMANDER SOFTWARE

Please rush me the following titles:

TITLE	MACHINE	PRICE £ p
-------	---------	--------------

.....
.....
.....
.....

Less discount
TOTAL

Consider the facts

I was very annoyed to read Justin Kerswell's letter in the July 12 *PCW* complaining about games not being released on the Commodore 64 until after they have been released on the Spectrum.

He is obviously suffering greatly from jealousy and not considering the facts. The Spectrum has been out longer than the CBM64. Any programmer writes on the machine he has which, more often than not, is a Spectrum. The problem is then for the software house to find a suitable author to convert programs from their original form onto other machines and games can sometimes be very hard to convert from the Spectrum to the 64.

As far as sound is concerned, the Spectrum is a bit pathetic but some games manage to overcome this — *Ugh!* is one example.

If the 64's graphics are so good why does Mr Kerswell want *Atic Atac* and *Jetset Willy* on the 64?

Surely, he can find something better on his own machine.

Alan Fairburn
69 Pontamman Road
Ammanford
Dyfed
Wales

Shake-up reviews

I would like to add to the comments following Boris Allan's *Ziggurat* on unsatisfactory reviews in the June 21 *PCW*.

I am fed up with reviewers comparing games for one computer with those for another. For example, when *The Hobbit* was first reviewed it was described as "the game by which all other adventures will be judged". As a result any new adventure is given a bad review if it isn't all-singing, all-dancing with hi-res colour graphics and three-part harmony music. In one magazine I read a review for a Dragon program that was totally derisory — simply because it wasn't as good as *Jet Pac* on the

Spectrum.

In some magazines the same people review for five or six different computers and are nearly always biased towards one in particular.

The whole system of games reviews in computer magazines needs a big shake-up. People with experience on a particular machine — who understand how it works — should be used.

Simon Mills
7 Boundaries Mansions
Boundaries Road
London SW12

Only sympathy

I was interested to read in the July 19 Issue that Clive Gifford — a reviewer of some 80 books and items of software — did not like my *Ziggurat* in the June 21 *PCW* concerning uncaring reviewers and reviewing.

Mr Gifford was even offended by my piece. All I can offer is sympathy — most people seem to agree with me...

Boris Allan
Stockport

Not quite right

I am writing to complain about your News Desk feature, and your apparent disregard for smaller companies wishing to appear in it.

Three weeks ago, we applied to appear in News Desk. We had produced a pack of listings for Dragon owners for use with the television series, *Me and My Micro*. We thought this was a useful service, and decided that it was worthy of

inclusion in News Desk.

We then telephoned you, to see what your reaction to the inclusion of such a feature was, and we were told 'Oh yes, that is definitely worth considering'. We forwarded a letter detailing our product, as requested, then we waited. And we still are.

Two issues of your magazine have passed, the first of which contained an advertisement placed by us, yet still no mention. We are prepared to accept that in the first of these issues, your space was swallowed up by a large feature on Dragon's carve up, but in the second issue, we can see no excuse for not including our piece. You had two pages instead of one. I am sure that our piece would have generated more interest than a stupid and rather sick cartoon.

In the future, could you try to give more thought to what you do and do not include. Remember that it is not only large companies who have useful services to offer.

Mark A Blease
Oron Software
64 Prince Street
Rochdale
Lancs OL16 5LJ

You seem to have got hold of the wrong end of the stick.

Every week we have far more news than we can possibly print and something has to go. The Newsdesk feature is not something you can make an application to appear in. And I'm afraid I don't share your view that our cartoon was "stupid and rather sick". I rather liked it.

A case of DIY

If like me you have purchased an Amstrad CPC464 computer and wish to use the centronics printer interface, you will probably have experienced difficulty obtaining a printer cable.

A phone call to Amsoft produced the information that they do not intend to make one available until their own printer is launched in September, and even then it probably won't be sold on its own.

It was obviously a case of

DIY. A solderless (IDT type) 36-way Amphenol connector for the printer and 34-way ribbon cable were easy to obtain from Technomatic, 305 Edgeware Road, London W2. A solderless 34-way, edge connector seemed non-existent, however, until I looked in Tandy and there it was — Part No 276-1564.

Although not strictly necessary, it is possible to insert a key in the edge connector (between contacts 3-4 and 21-22 — using Amstrad rather than Tandy numbering) by carefully sawing a small slot and glueing in a suitable piece of plastic. Fitting the connectors to the ribbon cable is easily done in a vice, but be sure you get them the right way round, with positions 18 and 36 of the Amphenol plug unused.

Total cost was about £12.

D M Bryant
4a Kenilworth Road
Petts Wood
Orpington
Kent

Rom failure

Reading the 'Answers to Queries' pages of computer magazines gives a fair indication of the frequency of faults (and bugs) on various machines.

It is only recently that the question of faulty Roms has come up. I wonder just how many Roms, which are in perfect condition during the early life of the machine, become 'bugged' as mine has. In my case the contents of an address used during loading has altered its contents. Luckily for me my Rom failed in an obvious way — the machine refused to load. But say an address affecting calculations had altered: say, my VAT return had been affected in some way, or a pharmacist's NHS return had come up with false figures, who would have been responsible?

How often do Roms fail? I would be interested to hear of your reader's experiences. Does anyone know why they fail?

D S McCarthy,
Southdown Stores,
Plumpton Green,
Sussex



**NEW
UNEXPANDED
VIC 20**

GAMES DESIGNER

MAKE GREAT GAMES....

Create your own amazing games with
Galactics unique **GAMES DESIGNER** cassette
for the unexpanded VIC 20, only **£9.95**
including post and packing

**ONLY
£9.95**

***No Programming experience Needed ***

With the **GAMES DESIGNER** you make your own machine code games.
You can design all the Graphics, Screen layouts, Theme tunes, Explosions,
Sound effects, Player speed, Alien speed, Skill level, Personalised game
credits, Scoring values, Keys used, Number of lives, Intelligence of aliens,
— whats more no programming experience needed.

Also includes 3 sample games:-
KANGA, ZYON and KRAZY MAZE.

NOW AVAILABLE FROM ALL LEADING BRANCHES OF



Galactic Software

UNIT 7, LARCHFIELD ESTATE,
DOWLISH FORD, ILMINSTER

SOMERSET TA19 0PF
TEL: (04605) 5161



MAKE GREAT GAMES

- * No programming experience needed
- * Full colour Hi-Res Graphics
- * Make your own sound effects
- * Joystick or Keyboard control

ALL IN MACHINE CODE

- * Variable degree of difficulty
- * Make your own, Monsters, Moonscapes, Space Ships, Aliens, Kangaroos or Asteroids
- * Create your very own Games



No.1

LATEST NEWS

QUICKSILVA Computing SECTION

QUICKSILVA

All titles available from Quicksilva Mail Order, P.O. Box 6, Wimborne Dorset BA21 7PY.

Home of The
Game Lords

USIVE • NEW PROGRAM PROBE EXCLUSIVE • NEW PR

Meet the perils of refuse in **TRASHMAN – Commodore 64 £7.95**

The job may look easy but only you know the hazards. Speeding cars, cyclists, vicious dogs, over-reacting in the transport cafe or one too many in the pub! A Trashman's lot is not an easy one. Discover just how difficult for yourself in TRASHMAN on the Commodore 64.

ESCAPE & 3D TUNNEL – Commodore 64 £7.95 each.

Follow the thrills!
What lies in the tunnel's depths? Flying bats, leaping toads, scurrying rats, crawling spiders and there may be more... All appearing live in the dreaded 3D TUNNEL.
Meanwhile, in the maze on the estates, what horrors lurk in the hedges? Where is the axe hidden? What prehistoric terrors will trap you? Can you survive the dinosaurs and the pterodactyls? Find out in ESCAPE if you dare! Available on the Commodore 64.

GATE CRASHER – BBC/ ELECTRON £6.95

An intoxicating game for the BBC and ELECTRON.
Do you enjoy being killed by aliens? Has your keyboard melted away under the heavy artillery? Do you have nightmares of swooping birdmen?
If so this is the game for you ... it has none of these!
GATE CRASHER is a game of skill and strategy that will test your mind to the limits, PLUS you will also have the opportunity to WIN £200!



ELECTRO-ART – Electron £14.95

Son of BEEB-ART!
Create your own works of art with this simple to use, yet sophisticated feature-rich art tool which includes a full machine code 'Paint' routine allowing you to colour fill any shape. ELECTRO-ART is supplied in a box with a full instruction manual.

VELNOR'S LAIR – Oric 1/Atmos £6.95

Battle the evil Wizard Velnor in the caves of Mount Elc. VELNOR'S LAIR is simply the most enjoyable adventure you will play on your computer!

MINED OUT For Bill the worm. Oric 1/Atmos £6.95

Following his success on the SPECTRUM, ELECTRON, BBC, LYNX and DRAGON, Bill the worm is now appearing in MINED OUT on the ORIC 1/ATMOS computers.

COMING SOON

ANT ATTACK – Commodore 64 £8.95

The outstanding Soft-Solid 3D graphics of the breathtaking city of Anteschier are now available on the Commodore 64. Battle the giant ants to save your hero!

COMING SOON

FRED – Commodore 64 £7.95

Action beneath the pyramids! Fearless Fred, the Intrepid Archaeologist, searches the creepy catacombs below the torrid tomb of Tootiecarmoon!

COMING SOON

GAMES 84 – Spectrum 48K

From the advanced programming project division of the SOFTWARE STUDIOS – GAMES 84, an Olympiad spectacular!

QED??



Available at:

WHSMITH



WOOLWORTH

John Menzies

and leading multiple retailers and specialist computer stores.

WARNING: These programs are sold according to QUICKSILVA Ltd's terms of trade and conditions of sale, copies of which are available on request.

Deathcap

Act quickly to avoid the fatal fungi in this new game for the Commodore 64 by Garry McPheators

The object here is to collect all the balls lying around, while taking care to avoid the deadly mushrooms and bricks. Colliding with bricks will mean you must start

the game again, but you'll lose a life if you bump into a mushroom. Each ball retrieved earns you five points, and there's a 300 point

bonus, plus an extra life if you reach 200. But the going gets tough at this point, with landmines appearing to thwart further progress.




```

0 REM*****
1 REM*
2 REM*   COPYRIGHT (C) 1984
3 REM*
4 REM*   BALL MAN FOR THE CBM 64
5 REM*
6 REM*   BY G.MCPHERSON
7 REM*
8 REM*****
9 PRINT "J":POKE53281,0:POKE53280,0:POKE53280,0:POKE53280,0
10 POKE53280,1:POKE53281,0:PRINT:GOTO 100
11 PRINT "PLEASE WAIT*****"
12 LI=3:CI=2:V=54295:W=54276:A=54277:HF=54273:
   LF=54272:S=54278:PH=54275:MV=0
13 SC=200:POKE550,255:PL=54274
14 POKE56334,PEEK(56334)AND254:POKE1,PEEK(1)AND251
15 FORI=0TO511:POKEI+12288,PEEK(I+5244):NEXT
16 POKE1,PEEK(1)OR4:POKE54334,PEEK(56334)OR1
19 REM*****CHARACTER SET*****
20 FORI=12288TO12381:READA:POKEI,A:NEXT
21 REM*****DATA FOR CHARACTERS*****
40 DATA0,243,243,243,0,63,63,63
50 DATA50,66,129,129,129,129,55,55
51 DATA24,60,125,255,153,24,24,24
52 DATA50,24,153,255,255,153,24,60
53 DATA0,247,152,152,244,24,24,247
54 DATA130,198,170,145,130,130,130,130
55 DATA254,130,130,130,130,130,130,254
56 DATA0,0,129,66,36,24,0,0
57 DATA0,254,128,128,254,128,128,254
58 DATA0,254,128,128,254,1,1,254
59 DATA255,129,129,129,129,129,129,255
60 DATA153,90,60,126,126,60,90,153
199 POKE53272,29
201 P=1524
202 REM*****PLACE RANDOM GRAPHICS ON SCREEN*****
210 PRINT "J"
211 FORM=1TO110
212 R=INT(RND(1)*650)
213 POKE1144+R,1:POKE55416+R,8
214 NEXTM
215 FORM=1TO100
216 R=INT(RND(1)*650)
217 POKE1144+R,2:POKE55416+R,0
218 NEXTN
221 FORM=1TO110
222 R=INT(RND(1)*650)
223 POKE1144+R,0:POKE55416+R,1
224 NEXTA
225 REM*****PRINT MAZE ONTO SCREEN ROUTINE*****
230 PRINT "*****"
239 FORI=0TO16
240 PRINT "*****";FORL=0TO2:POKELF+L,0:NEXT
241 POKELF+1,130:POKELF+5,9:POKELF+15,30:POKELF+24,
   15:FORL=0TO1:POKELF+4,21
242 POKELF+4,20:NEXT
243 NEXTI
250 PRINT "*****"
259 M=0
270 POKEP+M,3:POKEP+54272+M,1
273 POKE1483,10:POKE55755,1
274 POKE1464,10:POKE55755,1
275 POKE1485,10:POKE55757,1
276 POKE1523,10:POKE55755,1
277 POKE1525,10:POKE55757,1
278 POKE1563,10:POKE55683,1
279 POKE1564,10:POKE55636,1
280 POKE1565,10:POKE55637,1
281 REM*****MOVEMENT ROUTINE*****
300 GETA$
305 IFA$<" " THENPOKEP+M,32
310 IFA$="W" THENM=M+40:POKE55812,0
320 IFA$="X" THENM=M+40:POKE55812,0
330 IFA$="R" THENM=M+1:POKE55812,0
340 IFA$="D" THENM=M+1:POKE55812,0
341 IFPEEK(P+M)=0 THENPOKE55812,0
343 IFPEEK(P+M)=2 THEN I=I+1:POKE55812,0
344 IFPEEK(P+M)=1 THENSC=SC+5:POKE55812,0
345 IFPEEK(P+M)=11 THENL=L-1:POKE55812,0
346 IFSC=200 THENPOKE55812,0
347 IFLI=0 THEN3200
348 PRINT "*****";SC:PRINT "*****"
   FORI=1TOV
349 PRINT "*****";S:PRINT "*****"
   FORI=1TOV
350 GOTO270
499 REM*****SOUND, ETC.*****
500 POKEW,0:POKEP,0:POKELF,0:POKEV,15:POKEP,54
   POKEW,17:POKEHF,17:POKELF,37
501 RETURN
1000 POKELF+24,15:POKELF+5,34:POKELF+6,130:
   POKELF+1,45:POKELF,150:POKELF+4,33
1001 FORI=1TO500:NEXTI:FORI=0TO4:POKELF+1,
   15:RETURN
1200 MV=MV+1:RETURN
2000 SC=SC-2:FORL=0TO2:POKELF+L,0:NEXT
2001 POKELF+1,150:POKELF+5,9:POKELF+15,30:
   POKELF+24,15:FORL=0TO1:POKELF+4,21
2002 POKELF+4,20:NEXTI:M=0:RETURN
2003 REM*****END OF GAME ROUTINE*****
3200 POKE53272,22:POKEV,0:FORI=0TO2:POKEI,
   PRINT OR PRINT "YOUR SCORE="SC-1.5*MV
3300 PRINT "YOU ALSO HAD "LI" LIVES(") LEFT."
3400 INPUT "ANOTHER GAME (Y/N)";A$
3401 IFA$="Y" THENRUN
3402 IFA$="N" THENPRINT "BYE-BYE"
4000 SC=SC+300:LI=LI+1:FORM=1:POKE1224,
   INT(RND(1)*1000)/11:NEXTM:RETURN
4400 REM*****TITLE PAGE*****
4500 PRINT "*****PRESS ANY KEY TO
   START*****"
4520 GETA$:IFA$=" " THEN4520
4523 PRINT "J":POKE53281,0
4990 FORS=0TO200:POKE1024+INT(RND(1)*1000),87:NEXTS
4999 REM*****INSTRUCTIONS*****
5000 PRINT "*****INSTRUCTIONS FOR BALL MAN BY G.MCPH.
5001 PRINT "THE OBJECT OF THE GAME IS TO COLLECT
5002 PRINT "ALL THE BALLS WHICH ARE LINED AROUND.
5003 PRINT "WATCH OUT FOR THE 'MUSHROOM' MUSHROOMS.
5004 PRINT "BECAUSE YOU LOSE 1 LIFE EVERY TIME.
5005 PRINT "YOU TOUCH ONE, BEWARE!! YOU ONLY
5006 PRINT "HAVE 3 LIVES."
5007 PRINT "EVERY TIME YOU HIT A BRICK 2 POINTS,
   PRINT "ARE SUBTRACTED FROM YOUR
5008 PRINT "SCORE. YOU ALSO RETURN TO THE
   STARTING POSITION."
5009 PRINT "YOUR SCORE = SCORE IN GAME + 5 * MOVES
5010 PRINT "EVERY TIME YOU HIT A BALL YOU RECEIVE"
5012 PRINT "5 POINTS. THE KEYS ARE:
5013 PRINT "W : UP, X : DOWN, A : LEFT, L : RIGHT.
5014 PRINT "*****PRESS ANY KEY TO
   START*****"
5015 GETA$:IFA$=" " THEN5015
5016 PRINT "THE GAME FINISHES WHEN YOU HAVE 0
5017 PRINT "LIVES LEFT."
5018 PRINT "WHEN YOUR SCORE = 4000 POINTS THEN YOU
5019 PRINT "RECEIVE 8000 POINTS BONUS - BYE BYE"
5020 PRINT "LIFE, BUT BEWARE MINES START TO APPEAR.
5021 PRINT "*****PRESS ANY KEY TO
   START*****"
5022 PRINT "*****PRESS ANY KEY TO
   START*****"
5023 GETA$:IFA$=" " THEN5023
5024 RETURN

```


Trip of a lifetime

Christina Erskine talks to the threesome at Triptych Publishing

Take an ex-Army captain, a mass market book publisher, and an Australian civil engineer. Could this be the ideal mix for a new software house?

Certainly the triumvirate in charge at Triptych Publishing seem to think so. From hopeful beginnings at the London Business School, they are now on the point of launching a suite of six programs, aimed at bridging the gap between the home and business market.

"We met one another while doing the year-long Sloan programme at the Business school," said managing director David Juster, the former army officer. "Since everyone who does that particular course is expected to become a big boss after graduation, we were all full of ideas as to what to do after we'd finished."

It was David, too, who initiated the idea of going into computing. "I had come to the conclusion that computers were A Good Thing, and bought myself an Apple. Then I wasn't quite sure what to do with it, so I had to identify other computer buffs on the course and pick their brains."

David correctly identified civil engineer Stuart Armstrong, now Triptych's managing editor, and plans for a computer business began in empty lecture rooms at the end of the day.

"Originally we wanted to go for software in the educational market," continued David. "But as we went into the idea in more detail, we came up with one area where we felt there was a definite need."

Triptych's programs now fall into the applications category, with an education bias. 'Integrated applications through learning' is how they term it now, having

discovered that 'Adult-orientated software' had dubious overtones for some people!

The third member of the founding troupe, Duncan Baird, came in to provide useful publishing experience, to add to Stuart's technical know-how and David's management interest.

"We knew who our target audience was; people who have bought a micro and want to put it to serious use without necessarily learning to program," explained David.

"And we wanted our products to offer more than things like home budgets — after all, if you can't do your monthly accounts on the back of an envelope you might as well employ an accountant."

"The first six programs are fair indication of what will follow. *Entrepreneur* is a program designed to help someone set up a small business — you tap in projected figures, and the program will tell you what sort of profit you'll make, and what are the things to look out for. In some ways, we could have done with *Entrepreneur* when we set up Triptych."

Numbers at Work is a kind of adult numeracy program, which can help with anything from arithmetic to how to fully understand mark-ups, simple and compound interest and so on.

"Equally, *Project Planner*, *Decision Maker* and *Forecaster* can be used by either business people or interested home users."

Then we plan that about a quarter of our output will concentrate on more general topics. The first of those to come out will be *Star Watcher*, a comprehensive astronomy program."

Each of the program packages

comprises three parts: a teaching program designed to initiate the user into the subject, an applications program where they can use their knowledge to good effect and an accompanying book.

"The book contains anything that we feel is appropriate to text than to the micro — things you would want to flip through and refer back to, and which would take up memory space as reams of text on the screen," explained David.

Prices have been kept as low as possible — from £14.95 for Spectrum programs to £19.95 on the Commodore and BBC to discourage people from thinking the programs are either specialist or heavyweight. Triptych hopes its programs will be absorbing and interesting rather than simply educational.

"We've been very pleasantly surprised by some of the reactions to the titles. Stuart's wife, who had always been of the opinion that the only use for a home micro was to play *Pacman*, spent half an hour with *Project Planner*, and is now insisting that she gets a copy for the travel business she runs."

Confident though they are that they have found an untouched seam in the software market, there is still the problem of getting this across to the consumer.

"Quite honestly, it would have been helpful if one of the big companies had started doing this sort of thing already and paved the way for us. But while there are databases, word processors, spreadsheets and so forth around in abundance, there doesn't seem to be too much telling how to manipulate them and what sort of situations they are useful for. So it looks like we have to start the ball rolling."

"We really felt, 18 months ago, that the market now would be a lot more sophisticated than it actually is — and I wonder if the very mixed quality of today's software hasn't begun to put people off."

The trio went into every aspect of their image with a good deal of care. Some of the longest arguments arose over the company's name.

"We were adamant that we would not be Microsomething or Compusomething. We see ourselves as a creative editorial team, rather than overtly technical. Our name would have to be something esoteric, and something amorphic."

With a vocabulary like that, it is not surprising that David thought of Triptych. "I was amazed we hadn't thought of it before. A triptych is an artwork in three parts; there were three of us, and there are three parts to each of our programs — it fitted like a glove."

'Publishing' was added to avoid confusion with a Corby construction company with the same name, and their advertising agency thought up the name *Brainpower* for the program series, having presumably decided that Triptych could be too esoteric and amorphic for the mass-market.

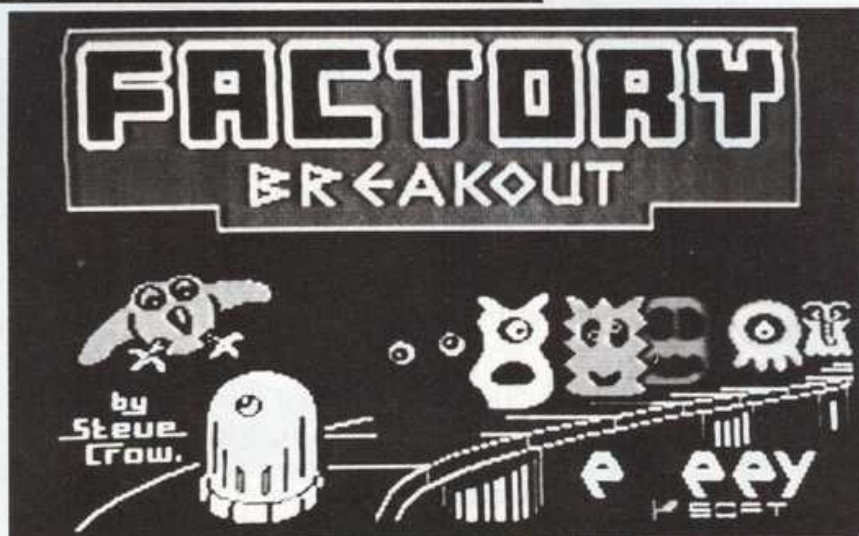


From left to right: Duncan Baird, David Juster and Stuart Armstrong

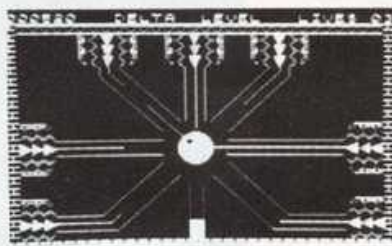
POPPY SOFT

For the 48K ZX Spectrum

**BRINGS YOU INTO
THE ACTION WITH**



FACTORY BREAKOUT – For the 48K ZX Spectrum. Help Zirky escape from the factory that's gone haywire. Three screens of thrilling arcade action. 100% machine code, super smooth animated graphics and amazing sound.



Zap the micron rays to hatch out of the egg capsule.



Dash across the conveyor belts on the reject line – don't let the killer canary catch you!



Battle against the many weird monsters in the lift room.



LASER SNAKER

for the 48K ZX Spectrum

Gobble the eggs in the plantation. Zap the aggranoids and vicious viproids to fight your way to the centre of the four mazes.

HANGMAN and BOUNCE PANIC

for the 48K ZX Spectrum

Two great games for the price of one! Graphical hangman is excellent for young children plus Bounce Panic – a great arcade game.



£5.50 each including VAT and Postage

**SPECIAL OFFER ANY 2 FOR £7.95
OR ALL 3 FOR ONLY £9.95!**

AVAILABLE AT LEADING SOFTWARE STORES
DISTRIBUTED BY LIGHTNING RECORDS

POPPY SOFT The Close, Common Road,
Headley, Newbury, Berkshire.

**POST NOW TO: POPPY SOFT, The Close, Common Road,
Headley, Newbury, Berkshire.**

Please send me

- ☐ **FACTORY BREAKOUT** ☐ **LASER SNAKER**
☐ **HANGMAN and BOUNCE PANIC** @ £5.50 each

I enclose a cheque/P.O. payable to: POPPY SOFT

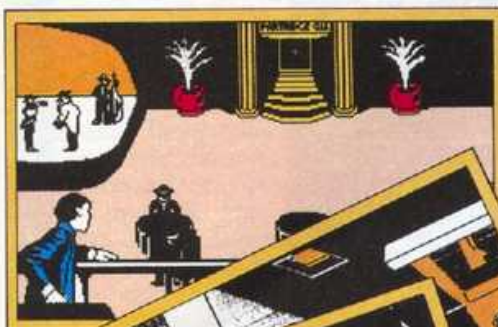
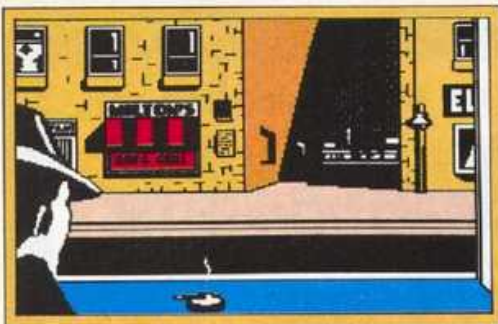
for £..... Signature

or debit my Access No.

Name

Address

Post Code.....



*I'll make you
an offer you
can't refuse.*

"Da game Mugsy have, an dis is no lie, da bes graphics eber seen on da Spectrum, da tru admospear ob da east sibd is dere complete wid da dames in da funny hats an da real hard guys in da suits". "Dis being a long statement I just cut da hole ding real short an say dat mugsy is a real good game wiv real A1 graphics" — Popular Computing Weekly.

"Mugsy is definitely different and the graphics are terrific"
— Computer Choice.

"The graphics which were all done using Melbourne Draw are quite stunning. Not only because they are large, but because they really do look as though they have come from a comic strip" — Crash.

"Using a punchy, fast moving dialogue and stunning graphics, Melbourne House have really created an atmosphere of Al Capone and organised crime. Mugsy must still rate as Melbourne's best offering since The Hobbit" — Computer and Video Games.

Available now for the Spectrum 48K at £6.95

Coming soon for the Commodore 64

☐ Please send me your free catalogue
Please send me:

SPECTRUM

- ☐ Spectrum Mugsy 48K £6.95
- ☐ Spectrum The Hobbit 48K £14.95
- ☐ Spectrum Penetrator 48K £6.95
- ☐ Terror-Daktal 4D 48K £6.95
- ☐ Melbourne Draw 48K £8.95
- ☐ H.U.R.G. 48K £14.95
- ☐ Abersoft Forth 48K £14.95
- ☐ Spectrum Classic Adventure 48K £6.95

ORIC-1

- ☐ Oric-1/48K The Hobbit £14.95

COMMODORE 64

- ☐ Commodore 64 The Hobbit £14.95
- ☐ Commodore 64 Hungry Horace £5.95
- ☐ Commodore 64 Horace Goes Skiing £5.95
- ☐ ACOS+ £8.95
- ☐ Commodore 64 Classic Adventure £6.95
- ☐ Commodore 64 Star Trooper £5.95

BBC/ELECTRON

- ☐ BBC Model B The Hobbit £14.95
- ☐ BBC/Electron Classic Adventure £6.95

Orders to:

Melbourne House Publishers,
39 Milton Trading Estate,
Abingdon, Oxon, OX14 4TD

Correspondence to:

Melbourne House, Church Yard Tring,
Hertfordshire.

Trade enquiries welcome

All Melbourne House cassette software is unconditionally guaranteed against malfunction. Access orders can be telephoned through on our 24 hour ansafone (0235) 83 5006

All versions of 'The Hobbit' are identical with regard to the adventure program. Due to memory limitations, BBC cassette version does not include graphics.

POP4/7

I enclose my cheque/money order for £		£
Please debit my Access Card No.	Expiry date	£ + p/p 80
Signature		Total
Name		£
Address		
Postcode		

All prices include VAT where applicable. Please add 80p for post and pack.

MUGSY

Muscle
in on da
action!

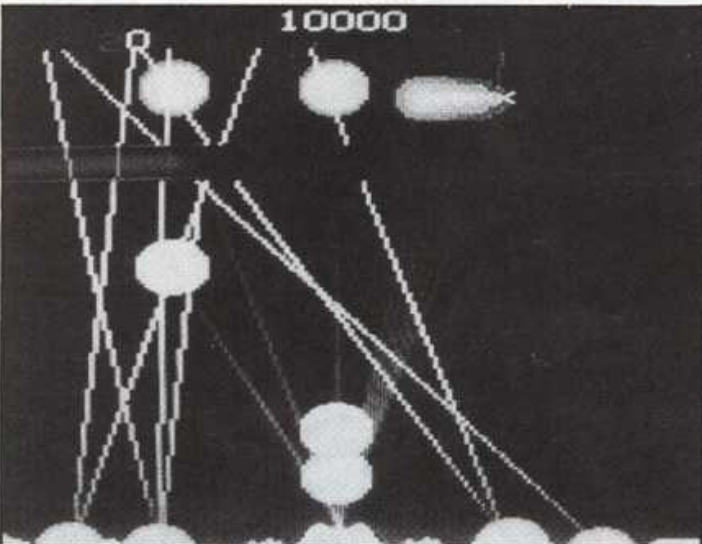


Melbourne House

Tracer bullets

Program *Missile Strike Micro*
BBC B **Price** £7.95 **Supplier**
Superior Software, Regent
House, Skinner Lane, Leeds
LS7 1AX.

Superior Software bill this as "the classic defence of six cities". It is. That's the good news and the bad news.



The screen shows a landscape with six blue cities. Waves of attackers streak down like tracer bullets to destroy them and your missile base. Using keys or joystick you move a cross-hair sight over the screen and fire at the attackers. You have to aim ahead of the incoming missiles as it takes a few moments for your defence rockets to rise.

Every now and then a huge aircraft or flying saucer appears and you get extra points for blasting it. You guessed it — another version of *Missile Command*.

On the plus side it's a very good implementation with fast response, clear graphics, decent noises and a number of increasingly nasty homing missiles in later stages. On the minus side — that's all it is.



Dave Watterson

We've seen games very like this so often that newcomers have to show more imagination and novelty than this to be appealing.

If it were a bargain-price tape it might pass, but as a full-price program it will only duplicate those you already have on the shelf.

Space spiders

Program *Laser warp Micro*
Amstrad **Price** £7.95 **Supplier**
Amsoft, 169 Kings Road,
Brentwood, Essex.

Laserwarp is one of approximately 60 programs in the first batch of titles released by Amsoft for the new Amstrad computer.

The plot of this arcade type game is nothing new: stop the "Master" from taking over the Galaxy by shooting a hole in his "Phoenix"-type mothership and then killing him. The only problem is that there are eight fleets of his minions to be destroyed first, including some very cute Galactic Spiders, Ar-

moured Droids and Hyperspace Chickens, all of which fire homing missiles at you. Each fleet also contains a number of indestructible craft which attempt to ram you. All pretty standard stuff.

It is very easy to play, being both joystick and keyboard compatible, as well as offering a practice mode, although the "Hold" key failed to work. The graphics are quite good, but the sound doesn't make full use of the machine.

Laserwarp is in fact very unexciting to play. The only attack wave that offered any real challenge is the one against the Master himself.

Greg Pearson



Grid games

Program *Noguard 32 and Connect 4 Micro* Dragon 32
Price £4.95 **Supplier** Oran Software, 64 Prince St, Rochdale, Lancs OL16 5LJ

Two popular games — *Connect 4* and *Othello* (called *Noguard 32* here) are contained on this cassette. Both are, of course, grid games. In *Othello*, each player must capture squares in order to take control of adjacent blocks. The object is to own more squares than the other player when all blanks have been filled. In this version high resolution graphics are used and the captured squares marked with a sunburst effect.

You can play either the computer or another player; against the computer, it is not too difficult to win.

Connect 4 is the game where the grid is seen as a series of columns and the player can take the next available square in any column building from the base. The object is to achieve four squares in any straight line. This version uses colour graphics.

This is very much an economy pack and good value at £4.95. There are no frills in either the games themselves or in the packaging but certainly the games are as authentic on the computer as on the original board versions.

Derrick Trueman



Rare jewels

Program *The Pit Micro*
Commodore 64 **Price** £9.95 **Supplier** Thorn EMI Software, Film House, 142 Wardour Street, London W1V 3RU

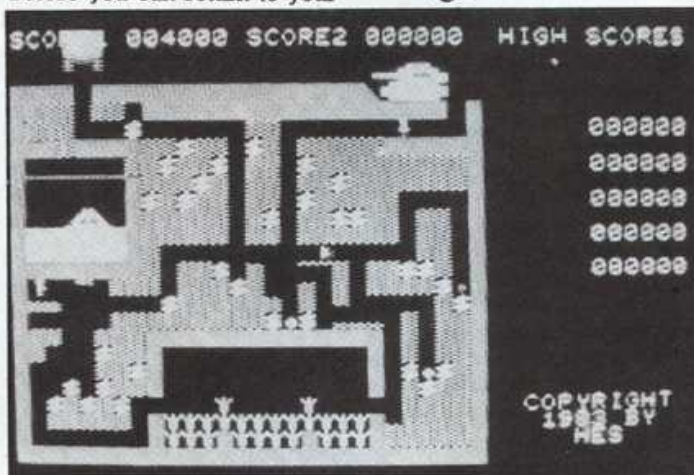
The *Pit* from HesWare seems very much like a throw-back to the early days of arcade games — it has only a single screen and no frills like music or different levels of difficulty.

The plot revolves around mining for rare jewels beneath the surface of an alien planet. The mine is guarded by robots which try to prevent you from reaching the jewels, but they are easily avoided or shot. Before you can return to your

ship, you must seize at least one of the large jewels from the Pit which is at the bottom of the mine. The jewels in here are guarded by deadly missiles. In order to get back to your ship you have to leave the Pit via a chamber containing a monster swimming in green slime. If you negotiate this bit successfully, the whole process is repeated again and again.

A pretty basic game. People who still enjoy *Space Invaders* may well find it of interest, but players who have become used to the faster and more sophisticated games now available will find the repetitive action and simple graphics and sound pretty unexciting.

Richard Corfield



Oops! We missed out the details from last week's review of *3D Tank Duel*. Here they are: **Micro 48K Spectrum** **Price** £5.50 **Supplier** Realtime Software, 32 Sovereign St, Leeds.



Time and logic

Program *Castle of Dreams*
Micro 48K Spectrum **Price** £7.95 **Supplier** Widgit Software, 48 Durban Road, London N2.

Castle of Dreams is a straightforward educational adventure game consisting of various puzzles and problems (differently arranged each time you play) which must be tackled successfully in order to progress through the castle corridors.

Provided with the game tape is a booklet describing the half dozen tasks you will tackle. These vary in difficulty: some, like matching some figures with their reflections, take time and logic; others, like using keys to pass through

different colour odours, are easy — unless, that is, you are using a black-and-white monitor. You'll need good mental arithmetic for the Mosaic Floor — but I'll let you find out why for yourself.

Unlike many other games there is no chance to save a partially completed game to tape, so you will need to book a good slab of computer time before playing.

The title is one of the shorter and more accessible adventure games around and so is ideal for the newcomer to decide if he or she really wants to get into the world of micro adventures. It won't challenge *The Hobbit* but it should find a niche in the market as a good beginners adventure.

Simon Springett



Sprite data

Program *Go Sprite Micro*
Commodore 64 **Price** £9.95 **Supplier** Mirrorsoft, Holborn Circus, London EC1.

One of the main complaints about the Basic on the Commodore 64 is that it is very difficult to make use of the advanced feature supported on this machine — high-resolution graphics, sophisticated sound and sprites.

Not surprisingly a large number of utility programs and Basic extension packs have appeared to fill the gap. *Go Sprite* from Mirrorsoft is one of the latest, a sprite development program which enables you to design, display and animate sprites.

The main program has three principal screens — one for editing sprites in either hi-res or multi-colour modes, one for selecting priorities, overlaying and copying sprites, and one

for animating them. On all screens functions are selected and controlled using a fashionable icon-driven command system similar to that used on some business micros. Up to 32 sets of sprite data can be created simultaneously making quite sophisticated effects possible. Once defined, your sprites can be saved on tape or disk for later use.

As well as the main program, the tape also provides four sets of sample sprite data and another program which generates Basic data statements from raw sprite data.

In a short review it is impossible to cover all the details of a package as sophisticated as *Go Sprite*. It is a complete sprite development tool, and is a very professional product. The command system is easily learnt, and once mastered it is very quick to use. Overall, this is an excellent utility.

Richard Corfield



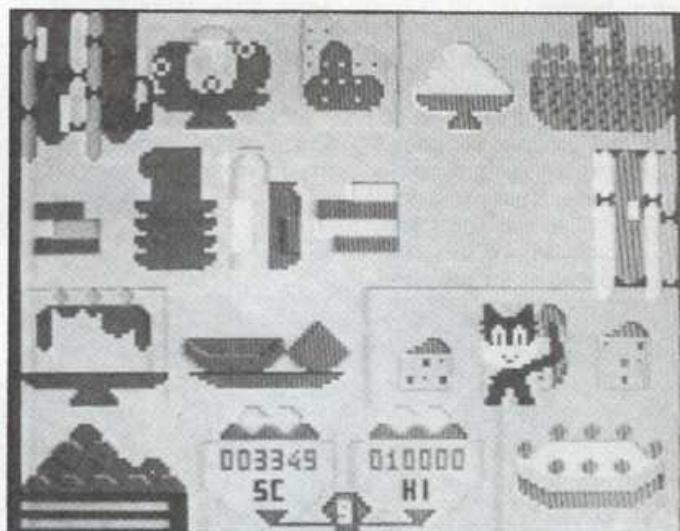
Nine lives

Program *Caesar The Cat*
Price £6.95 **Micro** BBC B **Supplier** Mirrorsoft, Holborn Circus, London EC1P 1DQ

Kittens are lovable but destructive beasts. Let loose along the shelves of a crowded larder an enthusiastic cat chasing mice can easily knock down dishes. If he catches the mice you might forgive him, but if he destroys your favourite china he's out on his ear! That's the basis for Mirrorsoft's *Caesar The Cat* game.

If he dislodges a red dish it's all over and the game ends. His mission is to pounce on various mice — thirty of them invading the larder. The quicker he does it the better. Think of the starting points as his lovability index — the less efficient he is and the more he breaks the less easy he is to be fond of. When he (and you) are good enough to clear out all the mice you start again with a faster, harder game . . . up to ten levels. (It ought to have been 9 lives really.)

The animation is superb, the screens colourful and the music good. *Caesar* can be controlled



A very colourful larder is shown, though the shelves themselves are not outlined. *Caesar* can jump up and down so long as he is between items of crockery. If he jumps on a dish it falls and points are lost.

led by keys or joysticks. It is great fun but I didn't find it compulsive.

Jan Watterson



Gremlins

Program *Mr Wiz Micro* **Electron** **Price** £7.95 **Supplier** Superior Software, Regent Street, Skinner Lane, Leeds LS7 1AK

Once upon a time there was a cute little pixie called Mr Wiz, who had mixed blessings. He lived in a garden full of cherries and apples but was perpetually being chased by the horrible gremlins who lived in the mushroom at the centre of the garden. They had this nasty habit of popping out of the mushroom whilst Mr Wiz was busy gobbling up as many of the cherries as possible before his final fate of being

eaten by the gremlins.

Luckily for Mr Wiz he had three lives; apples he could drop like bombs onto the nasty gremlins, and a final desperate measure he could kick his crystal ball at them.

Unfortunately for Mr Wiz, life in the garden was always short lived and he didn't by any means live happily ever after — least not with me in control.

About Mr Wiz I have mixed feelings. I liked the idea and the high speed chase which is the basis of the game. I disliked the never-ending music which accompanies the game like never ending ice-cream van chimes.

Fred Short



Slowed down

Program *Supercode II Micro*
16/48K Spectrum **Price** £9.95
Supplier CP Software, 17 Orchard Lane, Prestwood, Great Missenden, Bucks HP16 0HN.

Supercode II is a new version of CP Software's original Supercode Spectrum toolkit, now with more routines and compatible with Microdrives.

The routines can be used in both 16K and 48K machines, but with the larger memory you also load a Basic program which will demonstrate the routines in use.

Supercode's facilities include screen manipulation and scrolling routines, sound generators including a useful laser sound, and program compression, protection and manipulation routines. These include *On Error Goto* and *On Break Goto* — both useful in program writing as well as for program

protection. All the routines seemed to work, although not all were quite as useful as they might seem: I tried the Contract Program option to speed up a game I had written in Basic, only to find it slowed it down!

The program includes a useful Save to Microdrive option, but he warned — the saving operation re-formats the cartridge, deleting any other data on it.

The program was supplied with two manuals: the original Supercode version and a supplement explaining the new routines and Microdrive options. This arrangement is, frankly, a bit of a mess, and the sooner the two are combined into one the better.

Meanwhile, Supercode II offers a wide range of useful routines at a fair price.

Simon Springett



NO.	ROUTINE	INDEX	PAGE	NO.
1	PINEL UP-SCROLL			6400
2	PINEL DOWN-SCROLL			6408
3	CHRS / RTTR UP-SCROLL			6416
4	PINEL LEFT-SCROLL			6424
5	PINEL RIGHT-SCROLL			6432
6	CHRS LEFT-SCROLL			6440
7	CHRS TOP LEFT-SCROLL			6448
8	CHRS MID LEFT-SCROLL			6456
9	CHRS LOW LEFT-SCROLL			6464
10	CHRS TOP/MID LEFT-SC			6472
11	CHRS MID/LOW LEFT-SC			6480
12	CHRS RIGHT-SCROLL			6488
13	CHRS TOP RIGHT-SCROLL			6496
14	CHRS MID RIGHT-SCROLL			6504
15	CHRS LOW RIGHT-SCROLL			6512
16	CHRS TOP/MID RIGHT-SC			6520
17	CHRS MID/LOW RIGHT-SC			6528
18	RIPPLE LEFT-SCROLL			6536
19	SHUTTER LEFT-SCROLL			6544
20	RIPPLE RIGHT-SCROLL			6552

Magic carpet

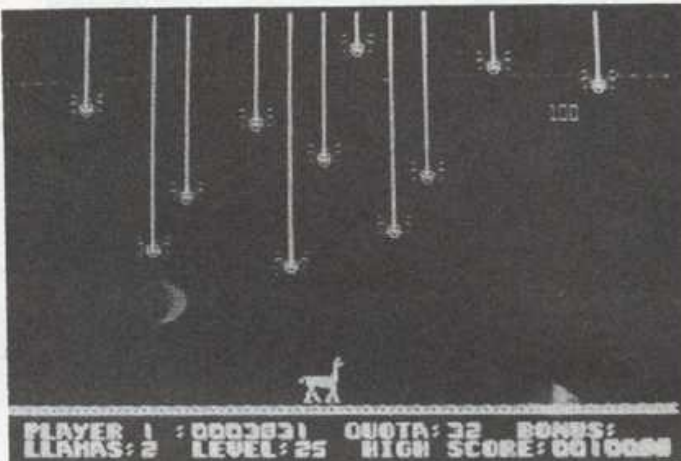
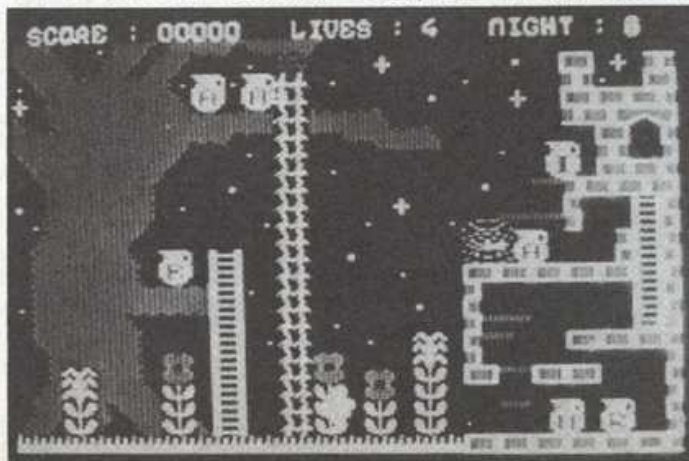
Program *Tales of the Arabian Nights Micro* Commodore 64
Price £7.00 (cassette) £9.00 (disc) **Supplier** Interceptor Micros, Lindon House, The Green, Tadley, Hants.

Speech without any extra hardware is promised by *Tales of the Arabian Nights* from Interceptor Micros.

As soon as the program has loaded the computerised voice makes itself heard. Admittedly it sounds like a Dalek with its mouth full of porridge, but with a little concentration you can make out what it is saying.

The voice speaks again at

the start of each level of this addictive arcade game. The plot concerns one Prince Imrahil, whose quest is to rescue Princess Amira from the clutches of the evil Sultan Saladin. To achieve his goal, he



Bolts of laser

Program *Megagalactic Llamas Battle at the Edge of Time Micro* Commodore 64 **Price** £5.50 **Supplier** Llamasoft, 49 Mount Pleasant, Tadley, Hants.

The longest game title ever seen must surely be *Megagalactic Llamas Battle at the Edge of Time*. No prizes for guessing this comes from Llamasoft.

It's actually a conversion of an expanded Vic20 game which Llamasoft put out some time ago. So it's not surprising to find that it has only a single screen of action.

This follows the pattern familiar from other Llamasoft offerings — what Jeff Minter likes to call "a fast blast". In this case, you control a llama which finds itself under attack from mutant

spiders. These descend on webs, which eventually break dropping the spider to the ground, whereupon it advances towards the llama, destroying it if it makes contact. The llama defends itself by spitting bolts of laser energy, these destroy the spiders and their webs. However, to make it more difficult, in order to hit the grounded spiders, the laser bolts must be bounced off a force field above the llama.

Despite the bizarre plot and simple action, this game is great. Jeff Minter long ago figured out how to write fun fast action games, and this one is well up to the usual standard, and only £5.50. The graphics and sound, although apparently quite simple, are also very effective.

Richard Corfield



desert by magic carpet. He then reaches the Sultan's Palace where he must avoid the guards and find his way through the Palace and its garden before he can free the Princess. They then make good their escape by magic carpet — all good Arabian Nights stuff.

It's original, challenging and very compulsive. The colourful and interesting graphics are of high quality, and the music track is exceptionally good — a very accurate version of *Scheherazade* by Rimsky-Korsakov.

In fact, this is one of the best games for the Commodore 64 I have seen for ages.

Richard Corfield



PHOTON wraith/disassembler for 48K ZX SPECTRUM

If you are rash enough to purchase a copy of PHOTON you will receive a cassette and printed instructions. No flashy inlay, no pretty box. At EIGEN SOFTWARE we believe that it's the software that counts, not the packaging. That's why we have produced the *best* 48K SPECTRUM disassembler plus a superb wraith and more — it's called PHOTON. Because PHOTON is so versatile it will take you a little more than a few minutes to learn how to use it (you will have to use the instructions): certainly time well spent.

PHOTON has been specifically designed for people who are serious about Z80* machine code programming. If you would like to find out more about this excellent program send a s.a.e to the address below.

At EIGEN SOFTWARE we produce state of the art programs, not inapt cosmetics.

PHOTON is a full colour, menu-driven machine code program and is accompanied by comprehensive instructions.

Send cheque/po for £10.85 (inc p&p) to **EIGEN SOFTWARE** 45 Bancroft Road, WIDNES, Cheshire WA8 0LR

*Z80 is a registered trademark of Zilog Inc.

$\hat{H}\psi = E\psi$ **EIGEN SOFTWARE**
create reality

CAMEL PRODUCTS

PRINT-SP

SPECTRUM CENTRONICS INTERFACE

- At a price you can afford £31.25
- FREE introductory offer, SPWRITE text processor, for 'normal people'
- Supplied with standard Centronics cable.
- Strong, matching ABS case connects neatly behind your Spectrum.

NEW NIKE-SP. SIMPLE to use nickel-cadmium back-up power supply unit providing OVER 30 minutes extra LIFE in event of mains failure.

(Also available for the ZX-81 ATMOS) £17.35

OTHER PRODUCTS AND PRICES

ROM-SP, loads 16K in 1/10th of a second from Eprom (£29.95). PROMER-SP, great value Eprom programmer for the Spectrum (£29.95). DHOBI-1, Eprom eraser (£18.95). BLOPROM-81, professional Eprom programmer for the ZX-81 (£79.95). PIO SP/81, 8+8 channel latched I/O card (£18.50/£14.95). APPLICATION NOTES on understanding Eproms (S.A.E. ref. EPROMS.).



UK VAT extra, P&P free
Europe P&P +5% — Overseas +10% NO VAT

CAMEL PRODUCTS from
Cambridge Microelectronics Ltd., One Milton Rd, Cambridge.
Tel. (0223) 314814 TLX 81574

Hard Facts on 64 Floppy Disks

The Commodore 64 Disk Companion is your authoritative guide to all the potential of the 1541 disk drive.

If you have, or are about to buy, a Commodore 1541, then make sure you've this book, The Commodore 64 Disk Companion.

It's the comprehensive, understandable guide. It introduces you to the hardware. It explores files and file handling. It explains the internal operations. And it includes programs for storage, recovery, data protection, and file management.

The Commodore 64 Disk Companion is at your book shop or computer dealer now. Get the facts now.



Please send me the Commodore 64 Disk Companion at £7.95 ISBN 0 946408 49 1.

- ☐ I enclose a cheque for £_____ payable to Sunshine Books.
- ☐ I enclose a postal order for £_____ payable to Sunshine Books.
- ☐ Please charge my Visa/Access card No. _____ valid from _____ expires end: _____

Signed: _____

Name: _____

Address: _____

Send to: Sunshine Books,
12/13 Little Newport Street, London WC2R 3LD.



Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-437 4343.

No strings attached

Alan McDonald takes a look at input and string manipulation in Part 3 of his adventure series

This week we shall take a look at input and string manipulation.

The Input routine

An effective input routine must do the following things:

- 1) Allow characters to be entered from the keyboard
- 2) Print what is being typed to the screen and store the information into a buffer
- 3) Allow typing mistakes to be corrected (Deleted)
- 4) Check to see if the Enter key is being pressed

A buffer is created (T-Buff) which is used to store the data being typed in.

The maximum amount of data that can be entered into the adventure game is 32 characters. This can be changed to a maximum of 255 by changing the following lines in the assembly listing. 3130 DEFS 32 DEFS amount, also change line 3530 to the required amount. (The scan routine will also need to be altered.)

A routine will need to check for valid key presses, in the range of 33 to 127. Study this week's assembler listing and examine the input routine. When the input routine is run a cursor will be printed to the screen at all times. It only disappears once Enter has been pressed.

To check for a key depression we use a routine similar to this:

```
LD A,204 ; equivalent of PAUSE 0
LD (23611),A ; in BASIC
CHECK LD A,(23611)
CP 204
JR Z,CHECK
LD A,(23560)
```

23611 is the system variable FLAGS whilst 23560 is the system variable LAST K.

Note: When the input routine is used characters may be deleted by pressing Delete (Caps shift + 0) or simply 0 on its own. Also note, it is possible to delete a whole line by pressing the Edit key (Caps shift + 1).

String manipulation

If you examine this week's assembly listing, you will find a section of code labeled 'Scan routine'.

What this does is to search through the buffer (T-BUFF) looking for a string of characters. As an example, let's imagine that we want to see if the buffer contained the word *Adventure*. We would do the following steps:

```
Z1 DEFM "ADVENTURE" ; the string 9 characters
; long plus a space

LD HL,Z1 ; HL register pair points to
; the string
LDB B,10 ; B register holds the length
; of the string
CALL FIND ; call the find routine
JP Z,FOUND ; if a match is made then
; jump to the routine found
```

If you have not already noticed, this week's assembler listing is divided into two

parts:

- 1) Part one lines 3030 to 4720
- 2) Part two lines 9080 to 10510

Part one contains the input and scan routines, whilst part two forms the main execution loop of the program. If you study it closely, you will notice that it calls non-existent routines. These routines will be given in future issues.

As another example, let's imagine that we wanted to search for the word *Look*. As you know in an adventure game, the word *Look* has the effect of redescending the current location. All we need to do is call the print location routine once the word *Look* or its abbreviation *L* have been typed in.

Here it is in Assembly format:

```
Z2 DEFM "L" ; the word 'L' is separated
; by 2 spaces.
Z3 DEFM "LOOK"

LD HL,Z2
CALL THREE ; 3 characters long
JP Z,PLOC ; if found jump to PLOC
LD HL,Z3
CALL FIVE ; 5 characters long
JP Z,PLOC ; if found jump to PLOC
```

Since most words in an adventure game are only three, four or five characters long, I have written small routines which save you from loading B with the length of the string. If length of string is three then:

CALL THREE

If it's four then:

CALL FOUR

and if it's five:

CALL FIVE

However, any other lengths are handled by:

LD B, length followed by CALL FIND

Next week we shall look at the *Get*, *Drop* and *Inventory* routines.

```
3030 : Input routine:
3031 : A buffer is created
3032 : which stores the
3033 : information being
3034 : typed in.
3035 :
3036 : T-BUFF DEFS 32
3037 : INPUT LD B,5
3038 : CALL PRINT
3039 : XOR A
3040 : LD (23692),A
3041 : LD A,0
3042 : LD (23658),A
3043 : CALL CL_BUF
3044 : LD A,0
3045 : RST 16
3046 : LD C,0
3047 : LD DE,T-BUFF+1
3048 : JR B,1_LOAD
3049 : LD A,(23611)
3050 : CP 204
3051 : JR Z,CHEK_1
3052 : PUSH HL
3053 : PUSH DE
3054 : PUSH DE
3055 : LD DE,7
3056 : LD HL,500
3057 : CALL 00385
3058 : POP DE
3059 : POP DE
3060 : LD A,(23560)
3061 : OR 128
3062 : LD 128
3063 : CP 7
3064 : JR Z,DALL
3065 : LD A,0
3066 : JR Z,DELTA
3067 : CP 0
3068 : JR Z,DELTA
3069 : LD A,0
3070 : JR Z,DELTA
3071 : LD A,0
3072 : JR Z,DELTA
3073 : LD A,0
3074 : JR Z,DELTA
3075 : LD A,0
3076 : JR Z,DELTA
3077 : LD A,0
3078 : JR Z,DELTA
3079 : LD A,0
3080 : JR Z,DELTA
3081 : LD A,0
3082 : JR Z,DELTA
3083 : LD A,0
3084 : JR Z,DELTA
3085 : LD A,0
3086 : JR Z,DELTA
3087 : LD A,0
3088 : JR Z,DELTA
3089 : LD A,0
3090 : JR Z,DELTA
3091 : LD A,0
3092 : JR Z,DELTA
3093 : LD A,0
3094 : JR Z,DELTA
3095 : LD A,0
3096 : JR Z,DELTA
3097 : LD A,0
3098 : JR Z,DELTA
3099 : LD A,0
3100 : JR Z,DELTA
3101 : LD A,0
3102 : JR Z,DELTA
3103 : LD A,0
3104 : JR Z,DELTA
3105 : LD A,0
3106 : JR Z,DELTA
3107 : LD A,0
3108 : JR Z,DELTA
3109 : LD A,0
3110 : JR Z,DELTA
3111 : LD A,0
3112 : JR Z,DELTA
3113 : LD A,0
3114 : JR Z,DELTA
3115 : LD A,0
3116 : JR Z,DELTA
3117 : LD A,0
3118 : JR Z,DELTA
3119 : LD A,0
3120 : JR Z,DELTA
3121 : LD A,0
3122 : JR Z,DELTA
3123 : LD A,0
3124 : JR Z,DELTA
3125 : LD A,0
3126 : JR Z,DELTA
3127 : LD A,0
3128 : JR Z,DELTA
3129 : LD A,0
3130 : JR Z,DELTA
3131 : LD A,0
3132 : JR Z,DELTA
3133 : LD A,0
3134 : JR Z,DELTA
3135 : LD A,0
3136 : JR Z,DELTA
3137 : LD A,0
3138 : JR Z,DELTA
3139 : LD A,0
3140 : JR Z,DELTA
3141 : LD A,0
3142 : JR Z,DELTA
3143 : LD A,0
3144 : JR Z,DELTA
3145 : LD A,0
3146 : JR Z,DELTA
3147 : LD A,0
3148 : JR Z,DELTA
3149 : LD A,0
3150 : JR Z,DELTA
3151 : LD A,0
3152 : JR Z,DELTA
3153 : LD A,0
3154 : JR Z,DELTA
3155 : LD A,0
3156 : JR Z,DELTA
3157 : LD A,0
3158 : JR Z,DELTA
3159 : LD A,0
3160 : JR Z,DELTA
3161 : LD A,0
3162 : JR Z,DELTA
3163 : LD A,0
3164 : JR Z,DELTA
3165 : LD A,0
3166 : JR Z,DELTA
3167 : LD A,0
3168 : JR Z,DELTA
3169 : LD A,0
3170 : JR Z,DELTA
3171 : LD A,0
3172 : JR Z,DELTA
3173 : LD A,0
3174 : JR Z,DELTA
3175 : LD A,0
3176 : JR Z,DELTA
3177 : LD A,0
3178 : JR Z,DELTA
3179 : LD A,0
3180 : JR Z,DELTA
3181 : LD A,0
3182 : JR Z,DELTA
3183 : LD A,0
3184 : JR Z,DELTA
3185 : LD A,0
3186 : JR Z,DELTA
3187 : LD A,0
3188 : JR Z,DELTA
3189 : LD A,0
3190 : JR Z,DELTA
3191 : LD A,0
3192 : JR Z,DELTA
3193 : LD A,0
3194 : JR Z,DELTA
3195 : LD A,0
3196 : JR Z,DELTA
3197 : LD A,0
3198 : JR Z,DELTA
3199 : LD A,0
3200 : JR Z,DELTA
3201 : LD A,0
3202 : JR Z,DELTA
3203 : LD A,0
3204 : JR Z,DELTA
3205 : LD A,0
3206 : JR Z,DELTA
3207 : LD A,0
3208 : JR Z,DELTA
3209 : LD A,0
3210 : JR Z,DELTA
3211 : LD A,0
3212 : JR Z,DELTA
3213 : LD A,0
3214 : JR Z,DELTA
3215 : LD A,0
3216 : JR Z,DELTA
3217 : LD A,0
3218 : JR Z,DELTA
3219 : LD A,0
3220 : JR Z,DELTA
3221 : LD A,0
3222 : JR Z,DELTA
3223 : LD A,0
3224 : JR Z,DELTA
3225 : LD A,0
3226 : JR Z,DELTA
3227 : LD A,0
3228 : JR Z,DELTA
3229 : LD A,0
3230 : JR Z,DELTA
3231 : LD A,0
3232 : JR Z,DELTA
3233 : LD A,0
3234 : JR Z,DELTA
3235 : LD A,0
3236 : JR Z,DELTA
3237 : LD A,0
3238 : JR Z,DELTA
3239 : LD A,0
3240 : JR Z,DELTA
3241 : LD A,0
3242 : JR Z,DELTA
3243 : LD A,0
3244 : JR Z,DELTA
3245 : LD A,0
3246 : JR Z,DELTA
3247 : LD A,0
3248 : JR Z,DELTA
3249 : LD A,0
3250 : JR Z,DELTA
3251 : LD A,0
3252 : JR Z,DELTA
3253 : LD A,0
3254 : JR Z,DELTA
3255 : LD A,0
3256 : JR Z,DELTA
3257 : LD A,0
3258 : JR Z,DELTA
3259 : LD A,0
3260 : JR Z,DELTA
3261 : LD A,0
3262 : JR Z,DELTA
3263 : LD A,0
3264 : JR Z,DELTA
3265 : LD A,0
3266 : JR Z,DELTA
3267 : LD A,0
3268 : JR Z,DELTA
3269 : LD A,0
3270 : JR Z,DELTA
3271 : LD A,0
3272 : JR Z,DELTA
3273 : LD A,0
3274 : JR Z,DELTA
3275 : LD A,0
3276 : JR Z,DELTA
3277 : LD A,0
3278 : JR Z,DELTA
3279 : LD A,0
3280 : JR Z,DELTA
3281 : LD A,0
3282 : JR Z,DELTA
3283 : LD A,0
3284 : JR Z,DELTA
3285 : LD A,0
3286 : JR Z,DELTA
3287 : LD A,0
3288 : JR Z,DELTA
3289 : LD A,0
3290 : JR Z,DELTA
3291 : LD A,0
3292 : JR Z,DELTA
3293 : LD A,0
3294 : JR Z,DELTA
3295 : LD A,0
3296 : JR Z,DELTA
3297 : LD A,0
3298 : JR Z,DELTA
3299 : LD A,0
3300 : JR Z,DELTA
3301 : LD A,0
3302 : JR Z,DELTA
3303 : LD A,0
3304 : JR Z,DELTA
3305 : LD A,0
3306 : JR Z,DELTA
3307 : LD A,0
3308 : JR Z,DELTA
3309 : LD A,0
3310 : JR Z,DELTA
3311 : LD A,0
3312 : JR Z,DELTA
3313 : LD A,0
3314 : JR Z,DELTA
3315 : LD A,0
3316 : JR Z,DELTA
3317 : LD A,0
3318 : JR Z,DELTA
3319 : LD A,0
3320 : JR Z,DELTA
3321 : LD A,0
3322 : JR Z,DELTA
3323 : LD A,0
3324 : JR Z,DELTA
3325 : LD A,0
3326 : JR Z,DELTA
3327 : LD A,0
3328 : JR Z,DELTA
3329 : LD A,0
3330 : JR Z,DELTA
3331 : LD A,0
3332 : JR Z,DELTA
3333 : LD A,0
3334 : JR Z,DELTA
3335 : LD A,0
3336 : JR Z,DELTA
3337 : LD A,0
3338 : JR Z,DELTA
3339 : LD A,0
3340 : JR Z,DELTA
3341 : LD A,0
3342 : JR Z,DELTA
3343 : LD A,0
3344 : JR Z,DELTA
3345 : LD A,0
3346 : JR Z,DELTA
3347 : LD A,0
3348 : JR Z,DELTA
3349 : LD A,0
3350 : JR Z,DELTA
3351 : LD A,0
3352 : JR Z,DELTA
3353 : LD A,0
3354 : JR Z,DELTA
3355 : LD A,0
3356 : JR Z,DELTA
3357 : LD A,0
3358 : JR Z,DELTA
3359 : LD A,0
3360 : JR Z,DELTA
3361 : LD A,0
3362 : JR Z,DELTA
3363 : LD A,0
3364 : JR Z,DELTA
3365 : LD A,0
3366 : JR Z,DELTA
3367 : LD A,0
3368 : JR Z,DELTA
3369 : LD A,0
3370 : JR Z,DELTA
3371 : LD A,0
3372 : JR Z,DELTA
3373 : LD A,0
3374 : JR Z,DELTA
3375 : LD A,0
3376 : JR Z,DELTA
3377 : LD A,0
3378 : JR Z,DELTA
3379 : LD A,0
3380 : JR Z,DELTA
3381 : LD A,0
3382 : JR Z,DELTA
3383 : LD A,0
3384 : JR Z,DELTA
3385 : LD A,0
3386 : JR Z,DELTA
3387 : LD A,0
3388 : JR Z,DELTA
3389 : LD A,0
3390 : JR Z,DELTA
3391 : LD A,0
3392 : JR Z,DELTA
3393 : LD A,0
3394 : JR Z,DELTA
3395 : LD A,0
3396 : JR Z,DELTA
3397 : LD A,0
3398 : JR Z,DELTA
3399 : LD A,0
3400 : JR Z,DELTA
3401 : LD A,0
3402 : JR Z,DELTA
3403 : LD A,0
3404 : JR Z,DELTA
3405 : LD A,0
3406 : JR Z,DELTA
3407 : LD A,0
3408 : JR Z,DELTA
3409 : LD A,0
3410 : JR Z,DELTA
3411 : LD A,0
3412 : JR Z,DELTA
3413 : LD A,0
3414 : JR Z,DELTA
3415 : LD A,0
3416 : JR Z,DELTA
3417 : LD A,0
3418 : JR Z,DELTA
3419 : LD A,0
3420 : JR Z,DELTA
3421 : LD A,0
3422 : JR Z,DELTA
3423 : LD A,0
3424 : JR Z,DELTA
3425 : LD A,0
3426 : JR Z,DELTA
3427 : LD A,0
3428 : JR Z,DELTA
3429 : LD A,0
3430 : JR Z,DELTA
3431 : LD A,0
3432 : JR Z,DELTA
3433 : LD A,0
3434 : JR Z,DELTA
3435 : LD A,0
3436 : JR Z,DELTA
3437 : LD A,0
3438 : JR Z,DELTA
3439 : LD A,0
3440 : JR Z,DELTA
3441 : LD A,0
3442 : JR Z,DELTA
3443 : LD A,0
3444 : JR Z,DELTA
3445 : LD A,0
3446 : JR Z,DELTA
3447 : LD A,0
3448 : JR Z,DELTA
3449 : LD A,0
3450 : JR Z,DELTA
3451 : LD A,0
3452 : JR Z,DELTA
3453 : LD A,0
3454 : JR Z,DELTA
3455 : LD A,0
3456 : JR Z,DELTA
3457 : LD A,0
3458 : JR Z,DELTA
3459 : LD A,0
3460 : JR Z,DELTA
3461 : LD A,0
3462 : JR Z,DELTA
3463 : LD A,0
3464 : JR Z,DELTA
3465 : LD A,0
3466 : JR Z,DELTA
3467 : LD A,0
3468 : JR Z,DELTA
3469 : LD A,0
3470 : JR Z,DELTA
3471 : LD A,0
3472 : JR Z,DELTA
3473 : LD A,0
3474 : JR Z,DELTA
3475 : LD A,0
3476 : JR Z,DELTA
3477 : LD A,0
3478 : JR Z,DELTA
3479 : LD A,0
3480 : JR Z,DELTA
3481 : LD A,0
3482 : JR Z,DELTA
3483 : LD A,0
3484 : JR Z,DELTA
3485 : LD A,0
3486 : JR Z,DELTA
3487 : LD A,0
3488 : JR Z,DELTA
3489 : LD A,0
3490 : JR Z,DELTA
3491 : LD A,0
3492 : JR Z,DELTA
3493 : LD A,0
3494 : JR Z,DELTA
3495 : LD A,0
3496 : JR Z,DELTA
3497 : LD A,0
3498 : JR Z,DELTA
3499 : LD A,0
3500 : JR Z,DELTA
3501 : LD A,0
3502 : JR Z,DELTA
3503 : LD A,0
3504 : JR Z,DELTA
3505 : LD A,0
3506 : JR Z,DELTA
3507 : LD A,0
3508 : JR Z,DELTA
3509 : LD A,0
3510 : JR Z,DELTA
3511 : LD A,0
3512 : JR Z,DELTA
3513 : LD A,0
3514 : JR Z,DELTA
3515 : LD A,0
3516 : JR Z,DELTA
3517 : LD A,0
3518 : JR Z,DELTA
3519 : LD A,0
3520 : JR Z,DELTA
3521 : LD A,0
3522 : JR Z,DELTA
3523 : LD A,0
3524 : JR Z,DELTA
3525 : LD A,0
3526 : JR Z,DELTA
3527 : LD A,0
3528 : JR Z,DELTA
3529 : LD A,0
3530 : JR Z,DELTA
3531 : LD A,0
3532 : JR Z,DELTA
3533 : LD A,0
3534 : JR Z,DELTA
3535 : LD A,0
3536 : JR Z,DELTA
3537 : LD A,0
3538 : JR Z,DELTA
3539 : LD A,0
3540 : JR Z,DELTA
3541 : LD A,0
3542 : JR Z,DELTA
3543 : LD A,0
3544 : JR Z,DELTA
3545 : LD A,0
3546 : JR Z,DELTA
3547 : LD A,0
3548 : JR Z,DELTA
3549 : LD A,0
3550 : JR Z,DELTA
3551 : LD A,0
3552 : JR Z,DELTA
3553 : LD A,0
3554 : JR Z,DELTA
3555 : LD A,0
3556 : JR Z,DELTA
3557 : LD A,0
3558 : JR Z,DELTA
3559 : LD A,0
3560 : JR Z,DELTA
3561 : LD A,0
3562 : JR Z,DELTA
3563 : LD A,0
3564 : JR Z,DELTA
3565 : LD A,0
3566 : JR Z,DELTA
3567 : LD A,0
3568 : JR Z,DELTA
3569 : LD A,0
3570 : JR Z,DELTA
3571 : LD A,0
3572 : JR Z,DELTA
3573 : LD A,0
3574 : JR Z,DELTA
3575 : LD A,0
3576 : JR Z,DELTA
3577 : LD A,0
3578 : JR Z,DELTA
3579 : LD A,0
3580 : JR Z,DELTA
3581 : LD A,0
3582 : JR Z,DELTA
3583 : LD A,0
3584 : JR Z,DELTA
3585 : LD A,0
3586 : JR Z,DELTA
3587 : LD A,0
3588 : JR Z,DELTA
3589 : LD A,0
3590 : JR Z,DELTA
3591 : LD A,0
3592 : JR Z,DELTA
3593 : LD A,0
3594 : JR Z,DELTA
3595 : LD A,0
3596 : JR Z,DELTA
3597 : LD A,0
3598 : JR Z,DELTA
3599 : LD A,0
3600 : JR Z,DELTA
3601 : LD A,0
3602 : JR Z,DELTA
3603 : LD A,0
3604 : JR Z,DELTA
3605 : LD A,0
3606 : JR Z,DELTA
3607 : LD A,0
3608 : JR Z,DELTA
3609 : LD A,0
3610 : JR Z,DELTA
3611 : LD A,0
3612 : JR Z,DELTA
3613 : LD A,0
3614 : JR Z,DELTA
3615 : LD A,0
3616 : JR Z,DELTA
3617 : LD A,0
3618 : JR Z,DELTA
3619 : LD A,0
3620 : JR Z,DELTA
3621 : LD A,0
3622 : JR Z,DELTA
3623 : LD A,0
3624 : JR Z,DELTA
3625 : LD A,0
3626 : JR Z,DELTA
3627 : LD A,0
3628 : JR Z,DELTA
3629 : LD A,0
3630 : JR Z,DELTA
3631 : LD A,0
3632 : JR Z,DELTA
3633 : LD A,0
3634 : JR Z,DELTA
3635 : LD A,0
3636 : JR Z,DELTA
3637 : LD A,0
3638 : JR Z,DELTA
3639 : LD A,0
3640 : JR Z,DELTA
3641 : LD A,0
3642 : JR Z,DELTA
3643 : LD A,0
3644 : JR Z,DELTA
3645 : LD A,0
3646 : JR Z,DELTA
3647 : LD A,0
3648 : JR Z,DELTA
3649 : LD A,0
3650 : JR Z,DELTA
3651 : LD A,0
3652 : JR Z,DELTA
3653 : LD A,0
3654 : JR Z,DELTA
3655 : LD A,0
3656 : JR Z,DELTA
3657 : LD A,0
3658 : JR Z,DELTA
3659 : LD A,0
3660 : JR Z,DELTA
3661 : LD A,0
3662 : JR Z,DELTA
3663 : LD A,0
3664 : JR Z,DELTA
3665 : LD A,0
3666 : JR Z,DELTA
3667 : LD A,0
3668 : JR Z,DELTA
3669 : LD A,0
3670 : JR Z,DELTA
3671 : LD A,0
3672 : JR Z,DELTA
3673 : LD A,0
3674 : JR Z,DELTA
3675 : LD A,0
3676 : JR Z,DELTA
3677 : LD A,0
3678 : JR Z,DELTA
3679 : LD A,0
3680 : JR Z,DELTA
3681 : LD A,0
3682 : JR Z,DELTA
3683 : LD A,0
3684 : JR Z,DELTA
3685 : LD A,0
3686 : JR Z,DELTA
3687 : LD A,0
3688 : JR Z,DELTA
3689 : LD A,0
3690 : JR Z,DELTA
3691 : LD A,0
3692 : JR Z,DELTA
3693 : LD A,0
3694 : JR Z,DELTA
3695 : LD A,0
3696 : JR Z,DELTA
3697 : LD A,0
3698 : JR Z,DELTA
3699 : LD A,0
3700 : JR Z,DELTA
3701 : LD A,0
3702 : JR Z,DELTA
3703 : LD A,0
3704 : JR Z,DELTA
3705 : LD A,0
3706 : JR Z,DELTA
3707 : LD A,0
3708 : JR Z,DELTA
3709 : LD A,0
3710 : JR Z,DELTA
3711 : LD A,0
3712 : JR Z,DELTA
3713 : LD A,0
3714 : JR Z,DELTA
3715 : LD A,0
3716 : JR Z,DELTA
3717 : LD A,0
3718 : JR Z,DELTA
3719 : LD A,0
3720 : JR Z,DELTA
3721 : LD A,0
3722 : JR Z,DELTA
3723 : LD A,0
3724 : JR Z,DELTA
3725 : LD A,0
3726 : JR Z,DELTA
3727 : LD A,0
3728 : JR Z,DELTA
3729 : LD A,0
3730 : JR Z,DELTA
3731 : LD A,0
3732 : JR Z,DELTA
3733 : LD A,0
3734 : JR Z,DELTA
3735 : LD A,0
3736 : JR Z,DELTA
3737 : LD A,0
3738 : JR Z,DELTA
3739 : LD A,0
3740 : JR Z,DELTA
3741 : LD A,0
3742 : JR Z,DELTA
3743 : LD A,0
3744 : JR Z,DELTA
3745 : LD A,0
3746 : JR Z,DELTA
3747 : LD A,0
3748 : JR Z,DELTA
3749 : LD A,0
3750 : JR Z,DELTA
3751 : LD A,0
3752 : JR Z,DELTA
3753 : LD A,0
3754 : JR Z,DELTA
3755 : LD A,0
3756 : JR Z,DELTA
3757 : LD A,0
3758 : JR Z,DELTA
3759 : LD A,0
3760 : JR Z,DELTA
3761 : LD A,0
3762 : JR Z,DELTA
3763 : LD A,0
3764 : JR Z,DELTA
3765 : LD A,0
3766 : JR Z,DELTA
3767 : LD A,0
3768 : JR Z,DELTA
3769 : LD A,0
3770 : JR Z,DELTA
3771 : LD A,0
3772 : JR Z,DELTA
3773 : LD A,0
3774 : JR Z,DELTA
3775 : LD A,0
3776 : JR Z,DELTA
3777 : LD A,0
3778 : JR Z,DELTA
3779 : LD A,0
3780 : JR Z,DELTA
3781 : LD A,0
3782 : JR Z,DELTA
3783 : LD A,0
3784 : JR Z,DELTA
3785 : LD A,0
3786 : JR Z,DELTA
3787 : LD A,0
3788 : JR Z,DELTA
3789 : LD A,0
3790 : JR Z,DELTA
3791 : LD A,0
3792 : JR Z,DELTA
3793 : LD A,0
3794 : JR Z,DELTA
3795 : LD A,0
3796 : JR Z,DELTA
3797 : LD A,0
3798 : JR Z,DELTA
3799 : LD A,0
3800 : JR Z,DELTA
3801 : LD A,0
3802 : JR Z,DELTA
3803 : LD A,0
3804 : JR Z,DELTA
3805 : LD A,0
3806 : JR Z,DELTA
3807 : LD A,0
3808 : JR Z,DELTA
3809 : LD A,0
3810 : JR Z,DELTA
3811 : LD A,0
3812 : JR Z,DELTA
3813 : LD A,0
3814 : JR Z,DELTA
3815 : LD A,0
3816 : JR Z,DELTA
3817 : LD A,0
3818 : JR Z,DELTA
3819 : LD A,0
3820 : JR Z,DELTA
3821 : LD A,0
3822 : JR Z,DELTA
3823 : LD A,0
3824 : JR Z,DELTA
3825 : LD A,0
3826 : JR Z,DELTA
3827 : LD A,0
3828 : JR Z,DELTA
3829 : LD A,0
3830 : JR Z,DELTA
3831 : LD A,0
3832 : JR Z,DELTA
3833 : LD A,0
3834 : JR Z,DELTA
3835 : LD A,0
3836 : JR Z,DELTA
3837 : LD A,0
3838 : JR Z,DELTA
3839 : LD A,0
3840 : JR Z,DELTA
3841 : LD A,0
3842 : JR Z,DELTA
3843 : LD A,0
3844 : JR Z,DELTA
3845 : LD A,0
3846 : JR Z,DELTA
3847 : LD A,0
3848 : JR Z,DELTA
3849 : LD A,0
3850 : JR Z,DELTA
3851 : LD A,0
3852 : JR Z,DELTA
3853 : LD A,0
3854 : JR Z,DELTA
3855 : LD A,0
3856 : JR Z,DELTA
3857 : LD A,0
3858 : JR Z,DELTA
3859 : LD A,0
3860 : JR Z,DELTA
3861 : LD A,0
3862 : JR Z,DELTA
3863 : LD A,0
3864 : JR Z,DELTA
3865 : LD A,0
3866 : JR Z,DELTA
3867 : LD A,0
3868 : JR Z,DELTA
3869 : LD A,0
3870 : JR Z,DELTA
3871 : LD A,0
3872 : JR Z,DELTA
3873 : LD A,0
3874 : JR Z,DELTA
3875 : LD A,0
3876 : JR Z,DELTA
3877 : LD A,0
3878 : JR Z,DELTA
3879 : LD A,0
3880 : JR Z,DELTA
3881 : LD A,0
3882 : JR Z,DELTA
3883 : LD A,0
3884 : JR Z,DELTA
3885 : LD A,0
3886 : JR Z,DELTA
3887 : LD A,0
3888 : JR Z,DELTA
3889 : LD A,0
3890 : JR Z,DELTA
3891 : LD A,0
3892 : JR Z,DELTA
3893 : LD A,0
3894 : JR Z,DELTA
3895 : LD A,0
3896 : JR Z,DELTA
3897 : LD A,0
3898 : JR Z,DELTA
3899 : LD A,0
3900 : JR Z,DELTA
3901 : LD A,0
3902 : JR Z,DELTA
3903 : LD A,0
3904 : JR Z,DELTA
3905 : LD A,0
3906 : JR Z,DELTA
3907 : LD A,0
3908 : JR Z,DELTA
3909 : LD A,0
3910 : JR Z,DELTA
3911 : LD A,0
3912 : JR Z,DELTA
3913 : LD A,0
3914 : JR Z,DELTA
3915 : LD A,0
3916 : JR Z,DELTA
3917 : LD A,0
3918 : JR Z,DELTA
3919 : LD A,0
3920 : JR Z,DELTA
3921 : LD A,0
3922 : JR Z,DELTA
3923 : LD A,0
3924 : JR Z,DELTA
3925 : LD A,0
3926 : JR Z,DELTA
3927 : LD A,0
3928 : JR Z,DELTA
3929 : LD A,0
3930 : JR Z,DELTA
3931 : LD A,0
3932 : JR Z,DELTA
3933 : LD A,0
3934 : JR Z,DELTA
3935 : LD A,0
3936 : JR Z,DELTA
3937 : LD A,0
3938 : JR Z,DELTA
3939 : LD A,0
3940 : JR Z,DELTA
3941 : LD A,0
3942 : JR Z,DELTA
3943 : LD A,0
3944 : JR Z,DELTA
3945 : LD A,0
3946 : JR Z,DELTA
3947 : LD A,0
3948 : JR Z,DELTA
3949 : LD A,0
3950 : JR Z,DELTA
3951 : LD A,0
3952 : JR Z,DELTA
3953 : LD A,0
3954 : JR Z,DELTA
3955 : LD A,0
3956 : JR Z,DELTA
3957 : LD A,0
3958 : JR Z,DELTA
3959 : LD A,0
3960 : JR Z,DELTA
3961 : LD A,0
3962 : JR Z,DELTA
3963 : LD A,0
3964 : JR Z,DELTA
3965 : LD A,0
3966 : JR Z,DELTA
3967 : LD A,0
3968 : JR Z,DELTA
3969 : LD A,0
3970 : JR Z,DELTA
3971 : LD A,0
3972 : JR Z,DELTA
3973 : LD A,0
3974 : JR Z,DELTA
3975 : LD A,0
3976 : JR Z,DELTA
3977 : LD A,0
3978 : JR Z,DELTA
3979 : LD A,0
3980 : JR Z,DELTA
3981 : LD A,0
3982 : JR Z,DELTA
3983 : LD A,0
3984 : JR Z,DELTA
3985 : LD A,0
3986 : JR Z,DELTA
3987 : LD A,0
3988 : JR Z,DELTA
3989 : LD A,0
3990 : JR Z,DELTA
3991 : LD A,0
3992 : JR Z,DELTA
3993 : LD A,0
3994 : JR Z,DELTA
3995 : LD A,0
3996 : JR
```


Safely saved

Frances Cameron shows you how to verify your microdrive programs

There's no *Verify* on the QL. I suppose it's just a sign of cheerful Sinclair optimism assuming that all microdrive *Saves* will be safe. They are not, and you don't want to lose any of your precious programs, so here's what you do.

When you are ready to *Save*, have a formatted microdrive cartridge in each of the slots, then:

```
save mdv1-progname
```

```
copy mdv1-progname to mdv2-progname
```

```
copy mdv2-progname to scr
```

and a screen Listing will show up in green ink on black paper. (Yes, do type in "scr".

It's quite correct.)

As you can see, there is only one real *Save*. When you copy this from mdv1 to mdv2, it's like doing a *Verify*. You won't get a copy unless there's been a good save. Copying from mdv2 to the screen is a double-check—and it takes very little time. There's no need to wait for the red light to go out before typing in the next instruction. The cursor stops flashing when the computer is busy so, as soon as the cursor re-appears, it is safe to type in and *Enter* the next command.

Here's a short program to try it out on. It doesn't do very much, but it's fun to watch and it'll go on quite happily on *F2 TV* until you've had enough. You can *Break* to finish.

Line 130 clears the workspace at the bottom of the screen as well as ensuring a completely free display area. (An ordinary *CLS* can leave unexpected traces behind it.)

Lines 150 to 200 are an example of QL Superbasic. Lines 160 to 190 go on repeating until you do something to stop them!

Line 160 puts a border four units wide round the display panel and runs through 256 different colour samples. It's quite effective on a TV screen, so don't be put off by the injunctions in the Beginner's Guide.

The *Beep* command doesn't work with the elegant simplicity of the Spectrum. It's better at good space invader noises. The program's command just gives a token background effect.

When you've typed this in, just *Save* to mdv1. Then *Copy* from mdv1 to mdv2 and, for a final conformation, *Copy* from mdv2 to the screen. If you don't want to keep both copies, then *Delete* one of them in the usual way.

```
100 REMark =====
110 REMark          "sunburst"
120 REMark =====
130 CLS#0 : CLS#2
140 PAPER 0 : CLS
150 REPEAT sunburst
160     BORDER 6, RND(255)
170     INK RND(1 TO 7)
180     LINE 80,60 TO RND(170),RND(100)
190     BEEP 165, RND(20)
200 END REPEAT sunburst
210 REMark =====
220 REMark copyright francis cameron
230 REMark          11 june 1984
240 REMark =====
```


QL

£49.00 INC

PARALLEL PRINTER INTERFACE

- ★ 12 months guarantee
- ★ Fully self-contained with connectors and 3.0 metre cable
- ★ Plugs into Sinclair QL's RS232C port and
- ★ Drives any CENTRONICS compatible printer, eg, Epson Seikosha Juki OKI NEC Shinwa Star MCP-40 Canon, etc, etc.
- ★ 14 day, full money back "no satisfaction" guarantee.

To order send name & address with cheque to
(please note our new address)

MIRACLE SYSTEMS LTD

Unit 37a

Avondale Workshops

Kingswood

Bristol BS15

Tel 0272-603871 x210

Ask at your local computer shop.

Sinclair and QL are trademarks of Sinclair Research Ltd

AVAILABLE NOW

GOLD CREST MAIL ORDERS ONLY

9 WINCHESTER ST. LONDON W.3

TOP-SAVINGS

COMPUTERS:

ZX SPECTRUM 16K	93.00	48K	£118.00
COMMODORE 64 64K			£186.00
BBC MICRO 32K			£380.00

SPECTRUM SOFTWARE:

Hulk, Sabre Wulf, Lords of Midnight, R.R.P. £9.95 O.R.P. £8.50. Mugsy R.R.P. £6.95 O.R.P. £5.85. Antics R.R.P. £6.95 O.R.P. £5.75. Jack & The Beanstalk R.R.P. £5.95 O.R.P. £4.90. Ad Astra, Tutenkamen, Cosmic Kanga, Pengy, Harrier Attack, Wheelie, Cavern Fighter, Manic Miner, Tribble Trubble, Blue Thunder, R.R.P. £5.95 O.R.P. £4.90. Atic Atak, Beaky & The Eggshatchers, R.R.P. £5.50 O.R.P. £4.80. Psytron R.R.P. £7.95 O.R.P. £6.50. Pyramid R.R.P. £5.50 O.R.P. £4.85. Doomsday Castle R.R.P. £6.50 O.R.P. £5.75. Deathchase, Code Name Mat, Scuba Dive, Les Filcs, Skull, Penetrator, Football Manager R.R.P. £6.95 O.R.P. £5.75. Jungle Trouble, Cyberzone R.R.P. £5.50 O.R.P. £4.60. Android Two R.R.P. £5.95 O.R.P. £4.80. Blade Alley R.R.P. £5.95 O.R.P. £5.20. Gilligan's Gold R.R.P. £5.90 O.R.P. £4.80. Moon Alert R.R.P. £5.90 O.R.P. £5.20. Pogo R.R.P. £5.90 O.R.P. £4.85. Hunchback R.R.P. £6.90 O.R.P. £4.80. Mr Wimpy R.R.P. £5.90 O.R.P. £5.20. Jet Set Willy R.R.P. £5.95 O.R.P. £4.95. Time Bomb R.R.P. £5.95 O.R.P. £4.80. Trashman R.R.P. £5.95 O.R.P. £4.70. Chequered Flag R.R.P. £6.95 O.R.P. £6.40. Night Gunner R.R.P. £6.95 O.R.P. £5.60. Timegate R.R.P. £6.95 O.R.P. £5.40. Fred, 3-D Ant Attack, Bugaboo, Snowman R.R.P. £6.95 O.R.P. £5.90. Flight Simulation R.R.P. £7.95 O.R.P. £7.20. Hobbit, Valhalla R.R.P. £14.95 O.R.P. £10.95. Classic Adventure R.R.P. £6.95 O.R.P. £5.75.

COMMODORE SOFTWARE:

Hulk, Beach-Head, R.R.P. £9.95 O.R.P. £8.50. Loco, Blagger, Son of Blagger, 737 Flight Path, Cybotron R.R.P. £7.95 O.R.P. £6.20. Sheep in Space R.R.P. £7.50 O.R.P. £6.40. Cavelon R.R.P. £6.90 O.R.P. £5.70. Attack/Revenge of Mutant Camels R.R.P. £7.50 O.R.P. £6.40. Heligate R.R.P. £5.00 O.R.P. £4.00. Gidrunner R.R.P. £5.00 O.R.P. £4.20. Quark R.R.P. £7.95 O.R.P. £6.80. Scuba Dive R.R.P. £6.95 O.R.P. £5.80. Les Filcs R.R.P. £7.95 O.R.P. £6.90. Space Pilot R.R.P. £7.95 O.R.P. £6.50. Superpipeline R.R.P. £6.90 O.R.P. £5.60. Bozo's Night Out R.R.P. £6.90 O.R.P. £5.75. Solo Flight R.R.P. £14.95 O.R.P. £11.95. Voodoo Castle, Snowball, R.R.P. £9.95 O.R.P. £8.00. Odyssey R.R.P. £6.95 O.R.P. £5.90. Hobbit 64 R.R.P. £14.95 O.R.P. £10.95. Colossal Adventure R.R.P. £9.95 O.R.P. £8.00. Transylvanian Tower R.R.P. £6.50 O.R.P. £5.20. Tales of Arabian Nights R.R.P. £7.00 O.R.P. £5.95.

THE LAST FOUR LINES ON STOCK, ORDERS UNDER £10.00, 28 DAYS FOR DELIVERY AND CONTACT BE MENTIONED AS BEFORE.

Kentech

A touch above the rest

HOLDERS OF THE LARGEST RANGE OF COMPUTER ACCESSORIES.

Joystick and Accessories

£

Pro-Ace Joystick	12.95
*Quickshot 2 Joystick	Atari £10.95
	Dragon £14.95
	BBC £18.95
*Zip Stick	Atari 14.95
	Dragon 15.95
	B.B.C. 17.95
	(Free Graphic Software)
DK Tronics Spectrum Dual Port Interface	12.95
Dual Port Interface	
Protek 2 Spectrum Switchable Interface	19.95
Prolink B.B.C. (B) Programmable Interface	9.95

Printer Accessories

Kempston Spectrum Centronics Interface Soft Driven	39.95
Rom Driven	54.95

ZX Print 3 Spectrum Centronics Interface Rom Driven	34.95
RS 232 or Centronics Cable for Above	9.95
VIC 20/64 Centronics Printer Lead	29.95
Dragon/Oric Centronics Printer Lead	14.95
B.B.C. Centronics Printer Lead	14.95

Voice Synthesisers

Cheetah Sweet Talker Spectrum	29.75
Cheetah Sweet Talker B.B.C.	24.95
Adman VIC 20 Voice Synth	49.95
Adman CMB 64 Voice Synth	29.95
Currah Spectrum Voice Synth	29.95

Miscellaneous

Datex VIC 20/64 Cassette Deck	39.95
Sound Module for Spectrum	12.95
Vixen VIC 20 16K	
Switchable Rampack	34.95
Vixen VIC 20	
Swithable Motherboard	31.95
New DK Tronics Keyboard for Spectrum	44.95
*Spectrum/ZX-81	new price 39.95
Cheetah 32K Ram Pack 8K for Spectrum	39.95
Keyboard Overlays Vic 20/Dragon	4.95
Keyboard Overlays B.B.C./CBM 64	5.95
Graphic Pads Spectrum	1.95
Graphic Pads B.B.C.	3.95
C15 Data Cassettes (High Quality)	.50
Dragons Eye Power Indicator	3.95
Soft covers (High Qual.) for Spectrum	2.95
VIC 20/64, Oric, B.B.C., Dragon, Atari 800 DXL	4.45
Hard Covers VIC 20/64 B.B.C.	8.95
	9.95

ALL PRICES INCLUDE VAT

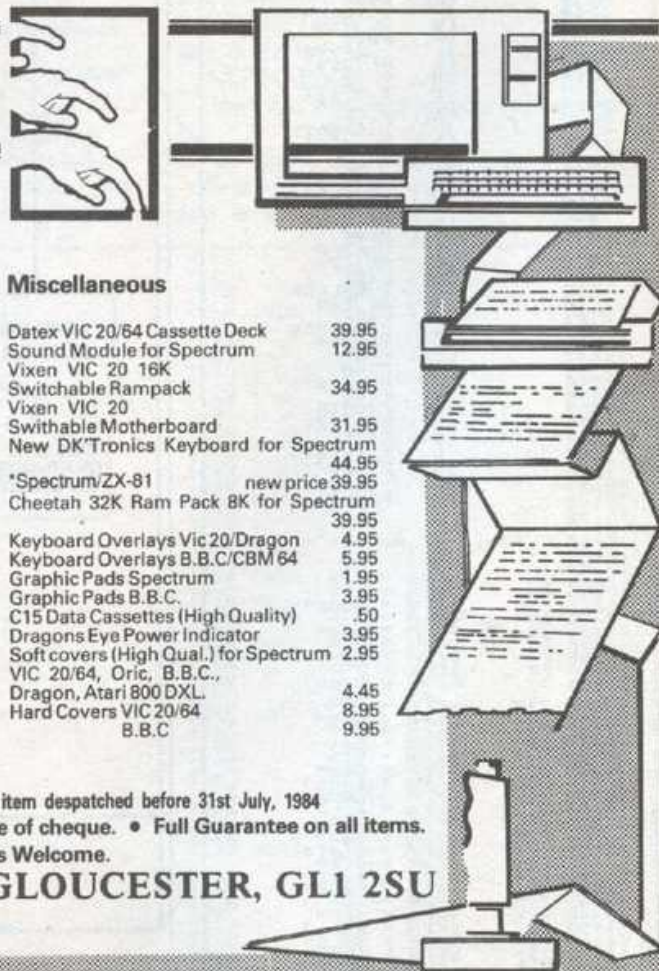
Postal Insurance Free • Delivery Free • FREE TWO C15 DATA CASSETTES with every item despatched before 31st July, 1984

ALL items in stock at time of going to press. • GOODS despatched on clearance of cheque. • Full Guarantee on all items.

Normal Delivery Time - 7 Days. • Trade Enquiries Welcome.

ST. OSWALDS ROAD TRADING ESTATE, GLOUCESTER, GL1 2SU

Telephone: (0452) 415002 Telex: 43514



Safely saved

Frances Cameron shows you how to verify your microdrive programs

There's no *Verify* on the QL. I suppose it's just a sign of cheerful Sinclair optimism assuming that all microdrive *Saves* will be safe. They are not, and you don't want to lose any of your precious programs, so here's what you do.

When you are ready to *Save*, have a formatted microdrive cartridge in each of the slots, then:

```
save mdv1-progname
```

```
copy mdv1-progname to mdv2-progname
```

```
copy mdv2-progname to scr
```

and a screen Listing will show up in green ink on black paper. (Yes, do type in "scr".

It's quite correct.)

As you can see, there is only one real *Save*. When you copy this from mdv1 to mdv2, it's like doing a *Verify*. You won't get a copy unless there's been a good save. Copying from mdv2 to the screen is a double-check—and it takes very little time. There's no need to wait for the red light to go out before typing in the next instruction. The cursor stops flashing when the computer is busy so, as soon as the cursor re-appears, it is safe to type in and *Enter* the next command.

Here's a short program to try it out on. It doesn't do very much, but it's fun to watch and it'll go on quite happily on *F2 TV* until you've had enough. You can *Break* to finish.

Line 130 clears the workspace at the bottom of the screen as well as ensuring a completely free display area. (An ordinary *CLS* can leave unexpected traces behind it.)

Lines 150 to 200 are an example of QL Superbasic. Lines 160 to 190 go on repeating until you do something to stop them!

Line 160 puts a border four units wide round the display panel and runs through 256 different colour samples. It's quite effective on a TV screen, so don't be put off by the injunctions in the *Beginner's Guide*.

The *Beep* command doesn't work with the elegant simplicity of the Spectrum. It's better at good space invader noises. The program's command just gives a token background effect.

When you've typed this in, just *Save* to mdv1. Then *Copy* from mdv1 to mdv2 and, for a final conformation, *Copy* from mdv2 to the screen. If you don't want to keep both copies, then *Delete* one of them in the usual way.

```
100 REMark =====
110 REMark          "sunburst"
120 REMark =====
130 CLS#0 : CLS#2
140 PAPER 0 : CLS
150 REPEAT sunburst
160     BORDER 6, RND(255)
170     INK RND(1 TO 7)
180     LINE 80,60 TO RND(170),RND(100)
190     BEEP 165, RND(20)
200 END REPEAT sunburst
210 REMark =====
220 REMark copyright francis cameron
230 REMark          11 june 1984
240 REMark =====
```


All clear for take-off

Jason Orbaum and Geoffrey Campbell continue their series on assembly programming

When we finished last week you should have had a general idea of the structure and flow of the program. This week sees the first part of the program presented, with another flowchart. This shows the theory put into practice to produce a simple, yet addictive, game.

The first commands of the program are known as *Assembler Directives*; they tell the assembler to do something, and are not part of the program. The *EQU* command here is used to set a *Constant*. To take the first line as an example, whenever the word *Score* is found, the number substituted will be decimal 2000. This is an address halfway down graphics page one. Unless the program is to use the Hi-Res pages (which this one does not), they are an ideal place to store numbers because the Dragon does not change them under normal circumstances.

You will have noticed that a gap of two addresses is left between *Score* and *Flag* whilst a gap of one is left between *Flag* and *Ship*. This is because *Flag* needs to be only a one-byte number as it will only contain a number in the page 0 to 255. *Score*, however, may contain numbers higher than this (depending on the player!) and so

needs to be a two-byte number.

START OF GAME

This initialises variables that must not be reset at the beginning of each wave. It does so by loading a register with the number to be stored and then storing it at the appropriate address.

START OF WAVE

This sets up the variables that have to be reset every wave (namely the *Flag* and the position of the plane). Routine *CL80* stores a character 128 (black square) in every location on the text screen, and in so doing clears it. Make sure that you understand how the loop is working as this routine is a good example of a *Block fill* routine (ie, a routine that fills a block of memory with a set value).

PUT UP BUILDINGS

This is possibly the most complicated routine that we will look at this week which is why it has a separate flowchart.

Having erected the buildings, we come to

the beginning of the main program (labelled *Move*). The first thing that this routine does is to check to see if the plane has reached the bottom-right of the screen, and if it has, control goes to *Fin* (covered next week). The program adds one to the plane position, so moving it along and down the screen, and looks to see what is in the new position. If it is a black space (ie, it is not a building) then the program branches on to the *Move Bomb* routine at *Past 1*.

CRASHED

If, however, the program finds something at the location then the plane has crashed and the program must notify the user. The subroutines called by this routine will be covered in detail next week but, in brief, they invert the screen, make a crashing sound, re-invert the screen, remove any green squares (for reasons covered next week), make another crashing sound, and print the score respectively.

The next few lines utilise one of the more useful ROM routines, jumping to the subroutine at hex 8006 (\$8006) polls the keyboard and returns the ASCII code of the character being pressed in accumulator A. If this is zero (ie, no key pressed) then the program re-polls the keyboard until a key is pressed. When a key is pressed, the program checks to see if it is an apostrophe and if it is then the program ends, otherwise it re-starts.

The Basic equivalent of this routine is as follows:

1F41	*			1F6A	*			1FB9	170141	LBSR	INV		
1F41	*	BLITZ V2.0		1F6A	108E001D	LDY	#29	1FBC	170157	LBSR	GREEN		
1F41	*			1F6E	B60113	LOOP4	LDA	#113	1FBF	17010C	LBSR	RANG	
1F41	*	G. CAMPBELL		1F71	8403		AND	#3	1FC2	1701FD	LBSR	SCR	
1F41	*	& J. ORBAUM		1F73	3402		PSHS	A	1FC5	B08006	LOOP3	JSR	\$8006
1F41	*			1F75	C610		LDR	#16	1FC8	27FB		BEQ	LOOP3
1F41	*	(c) 24/12/1983		1F77	3D		MUL		1FCA	0127		CMPL	#39
1F41	*			1F78	CB8F		ADDB	#143	1FCC	1026FF71		LBNE	BEGIN1
1F41	07D0	SCORE	EQU	2000	1F7A	3502	PULS	A	1FD0	39		RTS	
1F41	07D2	FLAG	EQU	2002	1F7C	BB07D9	ADDA	INC	1FD1		*		
1F41	07D3	SHIP	EQU	2003	1F7F	8E05FF	LDX	##5FF	1FD1		*	MOVE	BOMB
1F41	07D5	BPOS	EQU	2005	1F82	3420	PSHS	Y	1FD1		*		
1F41	07D7	WAVE	EQU	2007	1F84	301F	LEAX	-1,X	1FD1	B607D2	PAST1	LDA	FLAG
1F41	07D9	INC	EQU	2009	1F86	313F	LEAY	-1,Y	1FD4	0101		CMPL	#1
1F41	07DA	LINE	EQU	2010	1F88	26FA	BNE	DLOOP	1FD6	263B		BNE	PAST2
1F41	*			1F8A	3520		PULS	Y	1FD8	BE07D5		LDX	BPOS
1F41	*	START OF GAME		1F8C	E784	LOOP2	STB	.X	1FDB	308820		LEAX	32,X
1F41	*			1F8E	3088E0		LEAX	-32,X	1FDE	BF07D5		STX	BPOS
1F41	CC0901	BEGIN1	LDD	##901	1F91	4A	DECA		1FE1	A684		LDA	.X
1F44	FD07D7		STD	WAVE	1F92	26F8	BNE	LOOP2	1FE3	8180		CMPL	#128
1F47	8601		LDA	#1	1F94	170137	LBSR	RANG	1FE5	2709		BEQ	PAST4
1F49	B707D9		STA	TNC	1F97	170126	LBSR	PAUSE	1FE7	FC07D0		LDD	SCORE
1F4C	CC0000		LDD	#0	1F9A	313F	LEAY	-1,Y	1FEA	C30001		ADDD	#1
1F4F	FD07D0		STD	SCORE	1F9C	26D0	RNF	LOOP4	1FED	FD07D0		STD	SCORE
1F52	*			1F9E	BE07D3	MOVE	LDX	SHIP	1FF0	BE07D5	PAST4	LDX	BPOS
1F52	*	START OF WAVE		1FA1	8C05FF		CMPL	##5FF	1FF3	862A		LDA	#42
1F52	*			1FA4	102701CD		LBQ	FIN	1FF5	A784		STA	.X
1F52	8600	BEGIN	LDA	#0	1FA8	3001	LEAX	1,X	1FF7	8680		LDA	#128
1F54	B707D2		STA	FLAG	1FAA	BF07D3	STX	SHIP	1FF9	3088E0		LEAX	-32,X
1F57	CC0403		LDD	##403	1FAD	A684	LDA	.X	1FFC	A784		STA	.X
1F5A	FD07D3		STD	SHIP	1FAF	8180	CMPL	#128	1FFE	FC07D5		LDD	BPOS
1F5B	8E0400	CLS0	LDX	##400	1FB1	271E	RFA	PAST1	2001	108305E		CMPL	#1505
1F60	CC0000		LDD	##8080	1FB3				2005	250C		BLO	PAST2
1F63	ED81	LOOP1	STD	.X++	1FB3				2007	8600		LDA	#0
1F65	8C0600		CMPL	##600	1FB3				2009	B707D2		STA	FLAG
1F68	25F9		BLO	LOOP1	1FB3				200C	BE07D5		LDX	BPOS
1F6A	*			1F6A	*								
1F6A	*	PUT UP BUILDINGS											


```
10 AS=INKEYS: IF AS="" THEN GOTO 10
20 IF AS="," THEN END ELSE RUN
```

You will see the routine used a lot in the series, and also a variant of it covered later on in *Scan Keyboard*.

MOVE BOMB

The first thing that this routine does is check whether or not a bomb is in the air by looking at the contents of FLAG. A flag is simply a variable that is set (greater than 0) when a condition is satisfied, ie, a bomb is dropping, and is clear (0) when the condition is not satisfied.

If a bomb is dropping, then 32 is added to its position (ie, it moves down one line) and the contents of the new position are checked. If the space is not blank then the score has one added to it. At PAST4 the bomb is plotted at its new position, and the old one is then plotted over with a black square. The program does not do it in this order for convenience, but to produce a flicker-free image.

At address \$1FFE the program checks to see whether the bomb has reached the bottom of the screen. if it has, then the flag is cleared, and the bomb erased.

SCAN KEYBOARD

Here is the aforementioned variation on the earlier routine. Suffice it to say that the first six lines clear the buffers so that auto-repeat is achieved, then the keyboard is rolled and

if nothing has been pressed, the program branches to NOPRES, where a pause is executed. This pause takes as much time as the ROM routine takes if a key is pressed. This ensures that the plane does not slow down when a key is pressed.

If a key has been pressed, then a check is made to see if a bomb is dropping and if one is not, then a new bomb is released with a zapping sound (LBSR ZAP).

At NOKEY the plane is re-plotted. The end character is a space so that the plane erases itself. A call is next made to HUMM which, as its name suggests, hums for a length proportional to the contents of wave (so that the hum rises in pitch as the game progresses and gets faster).

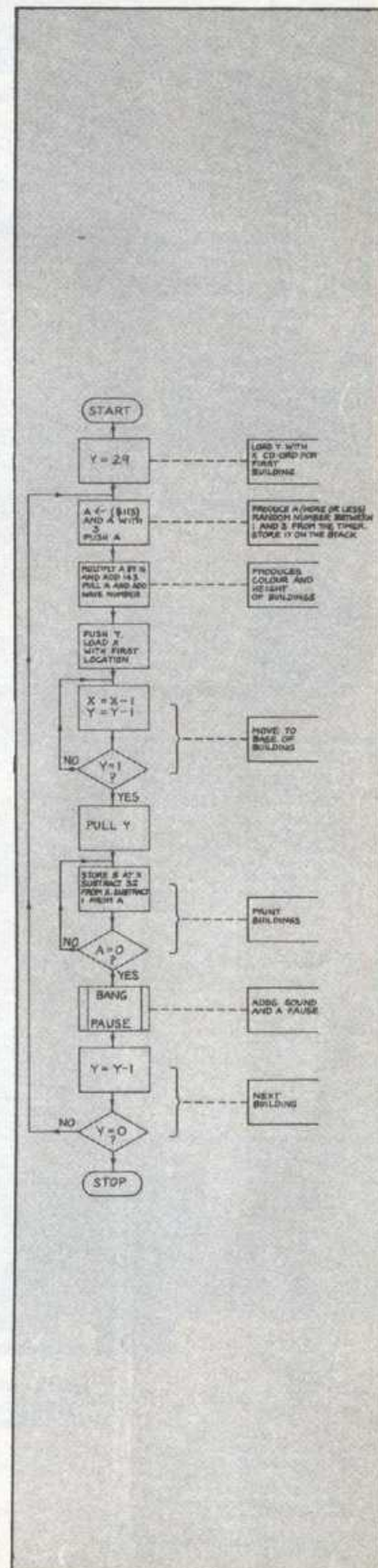
If the contents of wave are greater than three, and the contents of the timer (one way of achieving a pseudo-random number between 0 and 255) is less than the height of the green buildings (INC), the program scrolls the buildings; otherwise control is returned to Move.

SCROLL BUILDINGS

This routine scrolls the buildings upwards. It offers samples of two routines, a block move, and a block copy (although the latter is not necessary for the program).

A detailed description of their workings, along with the workings of the subroutines, the subroutines themselves, and a Basic loader for the program will be given next week.

200F 8680	LDA	#128	206A	*
2011 A784	STA	.X	206A	* SCROLL BUILDINGS
2013	*		206A	*
2013	* SCAN KEYBOARD		206A 8600	LDA #0
2013	*		206C B707DA	STA LINE
2013 C0FFFF	PAST2	LDD ##FFFF	206F FC07D3	LDI SHIP
2016 FD0150	STD	\$15A	2072 830020	FIND SUBD #32
2019 FD0152	STD	\$152	2075 10830400	CMPI #1024
201C FD0154	STD	\$154	2079 2505	RLI FPAST
201F FD0156	STD	\$156	207B 7C07DA	INC LINE
2022 FD0158	STD	\$158	207E 20F2	BRA FIND
2025 ED0006	ISR	\$0006	2080 7C07DA	FPAST INC LINE
2028 1027013E	LBEQ	NOPRES	2083 B607DA	LDI LINE
202C B607D2	LDA	FLAG	2086 108E0420	LDY #1056
202F 8101	CMPI	#1	208A 8E0400	LDX #1024
2031 2711	BEQ	NOKEY	208D 308820	FPL00P
2033 17015A	LBSR	ZAP	20A7 EC81	LEAX 32.X
2036 8601	LDA	#1	2090 31A820	LEAY 32.Y
2038 B707D2	STA	FLAG	2093 4A	DECA
203B FC07D3	LDD	SHIP	2094 26F7	BNE FPL00P
203E 830001	SUBD	#1	2096 ECR1	SCRL0P
2041 FD07D5	STD	APAS		LDD .Y++
2044 BE07D3	NOKEY	LDX SHIP	2098 ED81	STD .X++
2047 301E	LEAX	-2.X	209A 108C0600	CMPI ##600
2049 8680	LDA	#128	209E 25F6	BLO SCRL0P
204B A780	STA	.X+	20A0 8E05C0	LDX #1472
204D 863D	LDA	#61	20A3 108E05E0	LDY #1504
204F A780	STA	.X+	20A7 EC81	COPY
2051 4C	INCA			LDD .X++
2052 A784	STA	.X	20A9 EDA1	STD .Y++
2054 1700D2	LBSR	HUMM	20AB 108C0600	CMPI ##600
2057 B607D9	LDA	INC	20AF 25F6	BLO COPY
205A 8103	CMPI	#3	20B1 BE07D5	LDX BPOS
205C 1025FF3E	LEI	MOVIE	20B4 3088E0	LEAX -32.X
2060 B60113	LDA	\$113	20B7 BF07D5	STX BPOS
2063 B107D9	CMPI	INC	20BA 170011	LBSR BANG
2066 1022FF34	LBHI	MOVE	20BD 16FEDE	LBRA MOVE



NOW 3RD GREAT YEAR!

HIRE

SPECTRUM 2X81 and COMMODORE 64 TAPES

LIFE MEMBERSHIP £5.00 TAPES HIRE FROM 50P INCLUDING VAT

FREE ILLUSTRATED QUARTERLY MAGAZINE WITH TIPS, NEWS, REVIEWS, DISCOUNT OFFERS

OVER 3,000 DELIGHTED MEMBERS!

HUGE RANGE!
ADVENTURE GAMES
ARCADE and SIMULATION GAMES
BUSINESS and PRACTICAL PROGRAMS
UTILITIES
M/C COMPILERS
EDUCATIONAL
FROM OVER 60 TOP SUPPLIERS

SPECIAL OFFER! YOUR FIRST TWO TAPES FREE
IF YOU USE THIS COUPON!
or send £1 for magazine & details.
Props: ALEC FRY ARPS, FRSA and ERNA FRY, BA

THE ORIGINAL SOFTWARE LIBRARY!

Special offer from this issue: LIFE MEMBERSHIP £5
(normally £9.50). Overseas (Europe only) £10, or join local branch in W. Germany, France, Holland, Belgium, Scandinavia, South Africa, Ireland—send Int. Reply Coupon and we'll forward your enquiry. software supplied with owners permission. PCWK

■ The first true software library to be set up in the world—and still the largest ■ Unrivalled tape stock, as you'd expect from our head start ■ Run by a 16-bit computer (2 million bytes of program and data on disk!) with the help of six less able but more friendly mere humans! ■ Often imitated (sometimes almost to the letter—flattery indeed!) but never equalled ■ Friendly, helpful service—at the end of a phone if needed ■ Free membership of our Discount Club: pounds off peripherals and top-of-the-chart tapes ■ Any loading problems (rare!) automatically credited ■ Shop now open (next to Post Office) for rental and discount sales of tapes and peripherals ■ Branches throughout the world ■ No complicated schemes, no commitment to quantity—rent what and when you like ■ Printed, illustrated magazine "Computerchat" packs in more than any mere typed newsletter ■ Keenest-ever rates ■ ACCESS holders can join by telephone on 0730 892732 ■ NO RIVAL can offer all this....

To: SOFTWARE LIBRARY, Farnham Road, West Liss, Hants GU33 6JU.
NAME.....Machine.....
ADDRESS.....

POPULAR Computing WEEKLY

★ CLASSIFIEDS ★

- ★ Popular Computing Weekly was voted magazine of the year by the C.T.A.
- ★ It is Britain's only weekly home computer magazine with a published Audit Bureau of Circulation sales figure.
- ★ It has a classified section that is now required reading for everyone with an interest in small micros, or who wants to buy or sell: SOFTWARE ★ UTILITIES ★ ACCESSORIES ★ SERVICES ★ HARDWARE ★ HIRING ★ CLUBS ★ RECRUITMENT ★
- ★ £6 per SCC semi-display, 25p per word lineage.
- ★ 6 day copy date.

CALL DIANE DAVIS ON 01-437 4343 FOR AN IMMEDIATE QUOTE.

Popular Computing Weekly, Sunshine, 12/13 Little Newport Street, London WC2R 3LD



POPULAR Computing WEEKLY

Back Issues

Almost all the copies of PCW that you missed can still be bought as back issues for only 50p, including postage and packing.

An index of the contents of the 36 issues published in 1982 is now available from the Publishers for only £1.20. It includes full details of all the programs, routines, reviews and news that you might have missed.

Please send me the following back issues at 50p each:

Total £.....

Please send me a copy of the 1983 PCW Index at £1.20 ☐

I enclose a cheque/postal order for £.....

Name.....

Address.....

Please return to Back Issues, PCW, 12-13 Little Newport Street, London WC2R 3LD.

SAVE... SAVE... SAVE

DISCOUNT COMPUTERS AND SOFTWARE

48k Spectrum..... £119.95
48k Oric Atmos..... £139.95

Prices include VAT & P.&P.

Discount Software for Atari ★ BBC ★ CBM 64 ★ VIC 20 ★

Spectrum ★ Oric 1 ★ Oric Atmos ★ Texas 99/44

For free lists send SAE stating machine type to:

RAMTOPS

47 Broom Lane, Levenshulme, M/C M19 2TX
or telephone 061 442 5603.

TITANIC

The Adventure Begins...

With Currah Micro Speech

FREE on Side 2
a mini-epic in high energy rock
TITANIC (The music)

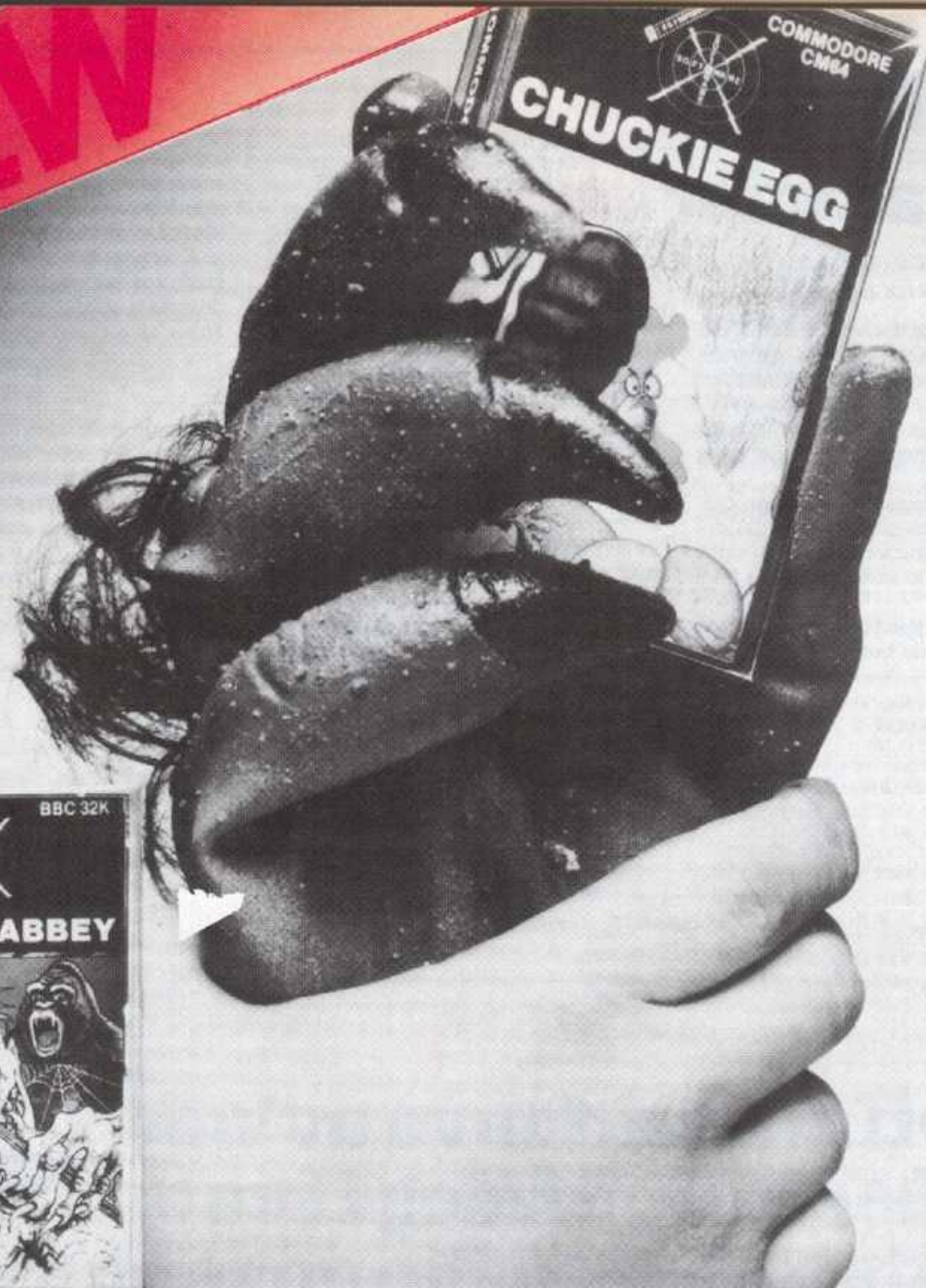


FOR 48K SPECTRUM

R&R Software Ltd, 5 Russell Street, Gloucester GL1 1NE. Tel: 0452 502819

NOW AVAILABLE ONLY £7.95

NEW



GET A GRIP OF A&F SOFTWARE

*Commodore CM64
Chuckie Egg
BBC 32K Haunted Abbey*

AVAILABLE FROM ALL GOOD COMPUTER SHOPS

John Menzies



Selected Stores

	CM64	BBC	ELECTRON	DRAGON	SPECTRUM
CHUCKIE EGG	£7.90	£7.90	£7.90	£7.90	£6.90
CYLON ATTACK		£7.90	£7.90		
HAUNTED ABBEY		£6.90			
PHARAOH'S TOMB		£7.90	£7.90		

Sold subject to A&F Software Ltd.
Full terms and conditions available on request

A&F Software

Unit 8, Canalside Industrial Estate,
Woodbine Street East, Rochdale, Lancs.
OL16 5LB. Tel: 0706 341111

In character

Mark Lawrence completes his two-part machine-code graphics utility for the BBC

Before you type in the second part of this graphics character design program, load in the first part of the listing, printed last week.

Before loading in part one switch the machine off and then on, and then enter `page=page+3000`.

The program allows you to design characters, rotate them clockwise by 90 degrees, flop the character from left to right, scroll it, invert it and save and load it from tape.

When you have typed in both parts of the listing save the code before attempting to

run it.

Now run the program and if it assembles correctly save the code by entering `*Save "char" EOO +604 EOO` then enter call `&EOO`. If you have typed it in correctly you should see an 8x8 grid, the user definable graphics set and a menu. The user definable graphics characters are printed alongside the grid, but since they are usually undefined when you first switch on it may appear that there is nothing there.

The menu lists the keys to be used. If you press Q or P (to store your design or pick up a character) the message 'which Character'

will appear. The characters are numbered from 1 to 9 and A to W inclusive so character 224 is 1, character 225 is 2 and character 233 is A. Pressing S or L will save or load the complete set of characters. To use your designs in your own program enter `'load'` either as a direct command or as part of your program. This will load your designs into the character area. To print your character use `Print N, Chrs(x)` where x is the character code, ranging from 224 to 255. If you are not sure which character code applies to your design enter `For N=224 TO 255:Print N, Chrs(N):Next N`. This will print out the characters with the relevant code alongside.

In addition to the keys listed in the menu, pressing escape will return you to Basic. Enter `Call &EOO` to return to the program.

2990CPX #4	3550BNE AD+2	4140BCC GO
3000BEQ NOUP	3560JSR CHAR	4150LDA #228
3010JSR PLUP	3570JSR &FFEE	4160GO JSR &FFEE
3020DEC X1	3580CLC	4170DEY
3030NOUP RTS	3590SBC #48	4180CPY #3
3040DO LDX X1	3600CLC	4190BNE GSUB+7
3050CPX #13	3610CMP #10	4200INX
3060BEQ NODO	3620BMI OK	4210CPX #13
3070JSR PLUP	3630CLC	4220BNE GSUB+5
3080INC X1	3640SBC #6	4230JSR SWAP
3090NODO RTS	3650OK CLC	4240RTS
3100LE LDY Y1	3660ASL A	4250PICK JSR AD
3110CPY #3	3670ASL A	4260STA PLB+1
3120BEQ NOLE	3680ASL A	4270LDX #0
3130JSR PLUP	3690RTS	4280PLB LDA &C00,X
3140DEC Y1	3700PUT JSR PSUB	4290STA TEMP,X
3150NOLE RTS	3710JSR AD	4300INX
3160RI LDY Y1	3720STA LB+1	4310CPX #8
3170CPY #12	3730LDX #0	4320BNE PLB
3180BEQ NOR1	3740LDA TEMP,X	4330JSR SET
3190JSR PLUP	3750LB STA &C00,X	4340JSR GSUB
3200INC Y1	3760INX	4350RTS
3210NOR1 RTS	3770CPX #8	4360UPS JSR PSUB
3220PSUB JSR SWAP	3780BNE LB-3	4370LDY TEMP
3230LDX #5	3790JSR SET	4380LDX #0
3240L2 LDY #11	3800RTS	4390LDA TEMP+1,X
3250L1 JSR AT	3810INVERT JSR SWAP	4400STA TEMP,X
3260TXA	3820LDX #5	4410INX
3270PHA	3830LDY #4	4420CPX #2
3280TYA	3840IL JSR AT	4430BNE UPS+8
3290PHA	3850TXA	4440STY TEMP+7
3300LDA #135	3860PHA	4450JSR GSUB
3310JSR &FFF4	3870TYA	4460RTS
3320CPX #132	3880PHA	4470DOS JSR PSUB
3330CLC	3890LDA #135	4480LDY TEMP+7
3340BNE O4	3900JSR &FFF4	4490LDX #7
3350SEC	3910LDA #224	4500LDA TEMP-1,X
3360O4 ROR TEMP+8	3920CPX #128	4510STA TEMP,X
3370PLA	3930BNE O1	4520DEX
3380TAY	3940LDA #228	4530BNE DOS+8
3390PLA	3950O1 JSR &FFEE	4540STY TEMP
3400TAX	3960PLA	4550JSR GSUB
3410DEY	3970TAY	4560RTS
3420CPY #3	3980PLA	4570LS JSR PSUB
3430BNE L1	3990TAX	4580LDX #8
3440LDA TEMP+8	4000INX	4590LDA TEMP-1,X
3450STA TEMP-5,X	4010CPY #12	4600ASL A
3460INX	4020BNE IL	4610ROL TEMP-1,X
3470CPX #13	4030INX	4620DEX
3480BNE L2	4040CPX #13 4050BNE INVERT+5	4630BNE LS+5
3490JSR SWAP	4060JSR SWAP	4640JSR GSUB
3500RTS	4070RTS	4650RTS
3510AD LDX #9	4080GSUB JSR SWAP	4660RS JSR PSUB
3520LDA TEMP+8,X	4090LDX #5	4670LDX #8
3530JSR &FFEE	4100LDY #11 4110JSR AT	4680LDA TEMP-1,X
3540DEX	4120LDA #224 4130LSR TEMP-5,X	4690LSR A


```

4700ROR TEMP-1,X
4710DEX
4720BNE RS+5
4730JSR GSUB
4740RTS
4750.ROT JSR PSUB
4760JSR SWAP
4770LDY #11
4780.L5 LDX #12
4790.L6 JSR AT
4800TXA
4810PHA
4820TYA
4830PHA
4840STA TEMP+8
4850LDA #13
4860CLC
4870SBC TEMP+8
4880TAX
4890LDA #224
4900LSR TEMP-1,X
4910BCC ROV
4920LDA #228
4930.ROV JSR &FEE
4940PLA
4950TAY
4960PLA
4970TAX
4980DEX
4990CPX #4
5000BNE L6
5010DEY
5020CPY #3
5030BNE L5
5040JSR SWAP
5050RTS
5060.MIR JSR PSUB
5070JSR SWAP

```

[illegible]

```

5430.FLAG BRK
5440.STORE
5450:NEXT
5460$STORE="RETCARHC"
5470A$=" HCIIHW"+CHR$(28)+CHR$(1)+CHR$(3
):$(TEMP:9)=A$
5480FORN$=0 TO 47:READA$:?(STORE+S+N$
A$:NEXT
5490DATA255,128,128,128,128,128,128,128,
128,128,128,128,128,128,128,128,255,0,0
,0,0,0,0,128,0,0,0,0,0,0,255,255,255
,255,255,255,255,255,255,66,36,24,24,36,
00,255
5500A$=CHR$(17)+CHR$(129)+CHR$(17)+CHR$
(31)+CHR$(31)+CHR$(10)+CHR$(2)+CHR$(0)+
GENERATOR"+CHR$(31)+CHR$(39)+CHR$(14)+CH
R$(17)+CHR$(130)+CHR$(12)+CHR$(3)+
" USE
THE FOLLOWING KEYS:"+CHR$(13)+CHR$(13)+
CURSOR KEYS TO MOVE CURSOR."
5510A$=A$+CHR$(13)+
Z TO CHANGE MODE (
PLOT/UNPLOT)."+CHR$(13)+
Q TO STORE DES
IGN."+CHR$(13)+
P TO PICK UP "+CHR$(0)+
", "+CHR$(13)+
S TO SAVE "+CHR$(0)+
S TO
TAPE."+CHR$(13)+
L TO LOAD "+CHR$(0)+
S FROM TAPE."+CHR$(13)
5520B$=" R TO ROTATE "+CHR$(0)+
, "+CHR$(
f13)+
M TO MIRROR "+CHR$(0)+
, "+CHR$(13
)+
I TO INVERT "+CHR$(0)+
, "+CHR$(13)+
Y,B,G,H TO SCROLL "+CHR$(0)+
(U/D/L/R)
"+CHR$(122)
5530$(STORE+57)=A$:$$(STORE+256)=B$
5540X$=(BLO+18)-256$INT((BLO+18)/256):Y
=INT((BLO+18)/256)
5550FORN$=BLO TO BLO+19:READ A$:?N$=A$:
NEXT
5560DATA X$:Y$:0,&C,0,0,0,&C,0,0,0,0,&C,0,
0,0,&D,0,0,0,67,13

```



**If you've ever been killed by
the evil goblin, flamed
by a dragon or turned to stone
by a wizard...**

then you need Micro Adventurer – the new monthly magazine devoted to all microcomputer adventures, war games and simulations.

Each issue offers a wide range of stimulating features, including:

- Helpline and Contact columns ■ Reviews of the latest adventures
- Competitions with exciting prizes ■ War gaming advice
- Adventures to type in and play ■ Profiles of famous adventurers
- Advice on how to write your own adventures

If all this sounds too good to be true then fill in the form below to make sure you receive your copy of Micro Adventurer.

SUBSCRIPTION ORDER FORM

Please send me 12 issues (a year's subscription) of *Micro Adventurer*, beginning with the _____ issue.

Name _____

Address _____

Signature _____ Date _____

This order should be accompanied by a cheque made payable to Micro Adventurer.

UK subscribers

UK subscribers
A year's subscription is £10.00 — please send this form with payment to Micro Adventurer, Subscriptions Department, Oakfield House, Perrymount Rd, Haywards Heath, Sussex

US/Canadian subscribers

A year's subscription at air-speeded rates is US\$33.95 — please send this form with payment to Micro Adventurer, c/o Business Press International, 205 East 42nd St., New York, NY 10017.



ANIROG

THE SKILFUL

Flight Path 737



ADVANCED PILOT TRAINER

FLIGHT PATH 737

For the skilful an advanced Pilot Trainer. Written by a flight simulator instructor and pilot. Panoramic Pilot's eye view.

COMMODORE 64	£7.95
VIC 20	£7.95
AMSTRAD MSX	£6.95

THE COURAGEOUS



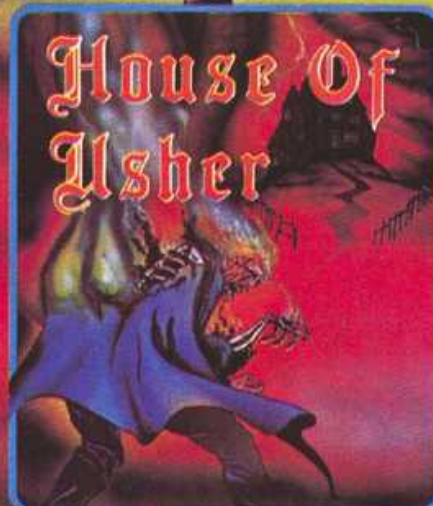
SPACE PILOT

For the courageous realise your dreams of being king of the open skies. Fly your aircraft into unrelenting dog fights with enemy fighters. Prove how well you can handle your craft. Five stages of tough engagements.

COMMODORE 64	£7.95
AMSTRAD	£6.95

COMMODORE AMSTRAD MSX

THE TERRIFYING



HOUSE OF USHER

Dare you enter the House of Usher. Behind each locked door of this nine room mansion a different style of arcade action awaits you.

COMMODORE 64	£6.95
AMSTRAD	£6.95

COMMODORE 64 AVAILABLE ON DISK AT £9.95

TRADE ENQUIRIES: ANIROG SOFTWARE LTD. 29 WEST HILL DARTFORD KENT (0322) 92513/8
MAIL ORDER: 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT CARD SALES HORLEY (02934) 6083
PAYMENT BY CHEQUE P.O. ACCESS/VISA 50p POSTAGE & PACKAGING

Cryptic codes

Protect your messages from prying eyes with Peter Bilbrough's program for producing secret codes

Considerable interest has been shown recently in using home computers to encipher or decipher information, either for amusement or to safeguard data.

Often the ciphers proposed are too simple to deserve serious attention. At the other extreme some methods offering great security have been suggested which are so complex as to be beyond the scope of the average home micro.

The program here has been designed to avoid the pitfalls of both extremes. It was written for the Commodore 64 but can be adapted to run on other machines. If properly used then it has the potential to provide what is arguably an absolute level of cryptographic security.

The program is broken into clear sub-routines which are each given Rem statements to identify their purpose. But before describing getting into the program it may be worth giving some background information on cryptology.

Any code considered for serious use should meet certain criteria.

- 1) The system should be materially, if not mathematically, indecipherable.
- 2) It should lend itself to automatic encipherment.
- 3) The resultant code — called the ciphertext — should not be unduly longer than the original plain text.
- 4) Any key used must be one which is easily remembered and flexible enough to be changed at will.
- 5) The cipher must be easy to operate.
- 6) It must not be liable to produce errors or unduly aggravate any errors which do arise.
- 7) The system must be so designed that knowledge of the program will not automatically compromise the cipher.

There are two ways of enciphering, sometimes both being applied in conjunction: Transposition — where the letters remain the same but their positions are

changed; and substitution — where the position of the letters remains the same but the letters themselves are replaced with others.

The PCW program incorporates substitution ciphers. Single alphabet substitution gives very little security so most substitution ciphers use some form of key. This is repeated along the length of the plaintext. The product of each key letter and text letter, calculated by one of several methods, becomes the cipher letter. This system is called 'Polyalphabetic'.

This type of code has one serious weakness — if the key is of finite length then, when the same letters of the plaintext are enciphered by the same length of the key, that part of the resulting ciphertext will also repeat. This gives clues as to keyword length and often results in discovery of the key.

Obviously, the security of the system will usually increase with the key length. Indeed the more complex polyalphabetic substitution ciphers include a means of suppressing this repetition.

The listing given here was a combination of two of these more advanced methods — interrupted key and aperiodic key and this is what gives this cipher its great security.

An aperiodic key is used to re-encipher the text obtained from the first enciphering method. Ideally this key should be completely random but this is not really feasible for home computers. An effective option and can be achieved by pseudo-random generation.

The plaintext is first enciphered by using an interrupted keyword. The keyword returns to the start when its letters are used up, as with the more simple methods. But it also returns when it meets a letter chosen by the user. This second 'random' return, based solely on the plaintext makes it a very secure cipher.

The method of operation has been kept simple. A keyword and interrupter letter

are fed into the computer for the first stage encipherment. A seed number is then chosen. This will be used to produce a sequence of letters for the re-encipherment which repeats identically whenever a particular number is selected but which is individual to that number. Not only does the use of a seed give access to almost unlimited combinations but it does away with the need to store random characters for feeding into the computer.

The program will put into code up to 250 characters. Each new text or block of 250 characters will need a new seed number if full security is to be maintained. Having said this, even the repeated use of sequences using the same 'seed' will still give a good degree of security.

One advantage of using keywords as well as seed numbers in encryption is that the need to repeat the seed is greatly reduced. People having different keys could use the same seed number and yet would produce completely different ciphertext results.

Not counting the time necessary to input the text, it takes nearly two minutes to encipher or decipher the full 250 characters. This compares favourably with about 270 characters dealt with in the same time by conventional electrical cryptographic machines.

Mention should be made of the use of the letter 'X'. This is generated in enciphering each time the space bar is hit when typing in the plain-text. When the text is deciphered it is converted back into a space. In this way the plain-text is reproduced word by word rather than in a continuous line or blocks of five. Obviously the letter will also be used as a normal character in some words — in which case it will be left out in the deciphering. However, it only appears on average twice in 1,000 characters and the message should still remain intelligible. As an alternative the letters 'ks' could be used, ie, toxic would become toksic.

To give some idea of the security of the program two blocks of coded text are shown. The letter X was used throughout with the seed numbers. 1.00000001 for Block One and 1.00000002 for Block Two. To show encryption as a 'worst case' the codeword chosen was XXXXX and the interrupter letter A.

Block 1

HQHUR FSCPE IYMOH QNOFW SAQCK PNMLP LIRHV JJRNH LQFJM SZMIM SLQPK WCCM DHPTP
TPL LHVUR MPQTM FNEOQ QYHAK CMWMP ACEPJ VROHQ VUPHG JVPIA GORHP CKQLD ZQFQM
MZWFYL PIYJB IQPOQ GYVYQ GWTCM CUEON IPJYK KEJHO ISXCM JGFRE LMSXN CDKZE AASLO
KQSIQRDFV LDJFE XSROO ZWZLE AWJCS HNFHQ LWYXK PHRKH QZRMH

Block 2

HSNLM JKCWD QPARN QFZVI PNEHY NJKXL FADEE HLAOP ORPZO BNHBU AHNPY DMPUF ARGSTCG
DHH WKPIF ZPQGN RNBVI QOERN OLXBK KKVOK APECM VOZEF WVNMR SHGSB HVPUR CDLIWEXWE
F MXZZA GLCPH SQRKZ OAPEP LMZYR FIXNW QNKQH FSOBM IIDHV VMOSO LQSDK SMHFI RDWUD
HRSEF OBHGS XJRXO LEZOZ NLQFP FFYKM OFIDU EGLRR NXBKM REWYQ


```

10 REM:*****
20 REM:***SUPERENCIPHERED INTERRUPTED***
30 REM:***PERIODIC KEY CIPHER***
40 REM:***BY***
50 REM:***PETER J BILBROUGH***
60 REM:***JULY 1984***
70 REM:*****
80 REM:***MENU***
90 POKE53280,0:POKE53281,0
100 PRINT CHR$(147)
110 PRINTTAB(8) "*****DATA SECURITY
PROGRAMME*****
120 PRINTTAB(12) "WDO YOU WISH TO :-"
130 PRINTTAB(12) "M1. ENCIPHER TEXT"
140 PRINTTAB(12) "M2. DECIPHER TEXT"
150 PRINTTAB(12) "M3. END PROGRAMME"
160 PRINTTAB(12) "M4. SELECT NUMBER"
170 GET# : IF#="" THEN170
180 IF#="1" THEN180
190 IF#="2" THEN190
200 IF#="3" THENGOSUB5010:GOTO170
210 END
500 REM:***INPUT PLAINTEXT***
510 GOSUB2010
520 PRINT"TYPE UPTO",W,"CHARACTERS OF
PLAINTEXT."
530 PRINT"ALWAYS END BELOW A MARKER,
USE SPACE"
540 PRINT"BAR BETWEEN WORDS AND TO
REACH MARKERS."
550 PRINT"AUDIBLE WARNING IS GIVEN 5
CHARACTERS"
560 PRINT"BEFORE MAXIMUM PERMITTED TEXT
LENGTH."
570 PRINT " | | | | |
| | | | |
580 GET# : IF#="" THEN580
590 IF#=" " THEN#="X"
600 G=ASC(G#)
610 IFG>47ANDG<58ORG>64ANDG<91THENMS#
=MS#+G# : PRINTG# : L=L+1
620 IFG=20ANDL>0THENPRINTG# : L=L-1
MS#=LEFT$(MS#,L)
630 IFG<5ANDLEN(MS#)=4-5THENGOSUB6010
640 IFG=13ANDLEN(MS#)/5<INT(LEN(MS#)/5)
THENGOSUB5010:GOTO500
650 IFG<13ANDL<0THEN500
660 PRINT"*****THE TEXT IS
NOW BEING ENCIPHERED*****"
670 GOTO3010
1000 REM:***INPUT CIPHERTEXT***
1010 GOSUB2010
1020 PRINT"TYPE UPTO",W,"CHARACTERS
OF CIPHERTEXT."
1030 PRINT"WITHOUT SPACING, ALWAYS
END BELOW A"
1040 PRINT"MARKER, AUDIBLE WARNING
IS GIVEN 5"
1050 PRINT"CHARACTERS BEFORE MAXIMUM
PERMITTED"
1060 PRINT"TEXT LENGTH."
1070 PRINT " | | | | |
| | | | |
1080 GET# : IF#="" THEN1080
1090 G=ASC(G#)
1100 IFG>47ANDG<58ORG>64ANDG<91THENMS#
=MS#+G# : PRINTG# : L=L+1
1110 IFG=20ANDL>0THENPRINTG# : L=L-1
MS#=LEFT$(MS#,L)
1120 IFG<5ANDLEN(MS#)=4-5THENGOSUB6010
1130 IFG=13ANDLEN(MS#)/5<INT(LEN(MS#)
/5)THENGOSUB5010:GOTO1000
1140 IFG<13ANDL<0THEN1000
1150 PRINT"*****THE TEXT IS
NOW BEING DECIPHERED*****"
1160 GOTO4010
2000 REM:***CALCULATION OF KEY***
2010 PRINTCHR$(147)
2020 PRINT"GIVE DESIRED TEXT LENGTH
IN MULTIPLES"
2030 PRINT"OF FIVE (NOT TO EXCEED
250 CHARACTERS)."
2040 INPUTW
2050 IFW<250THENPRINT"IT" :GOSUB5010
:GOTO2040
2060 IFW<5<INT(W/5)THENPRINT"IT"
:GOSUB5010:GOTO2040
2070 PRINT"MINPUT A KEY OF AT LEAST
FIVE CHARACTERS"
2080 PRINT"IN LENGTH (USING NO SPACES).
IT WILL BE"
2090 PRINT"USED FOR FIRST STAGE TEXT
ENCIPHERMENT."
2095 INPUTQ#
2100 IFLEN(Q#)<5THENPRINT"IT" :GOSUB5010
:GOTO2095
2110 PRINT"MINPUT A LETTER, PREFERABLY-
A,E,I,N,O,R,"
2120 PRINT"S OR T, IT WILL BE USED
TO GENERATE"
2130 PRINT"RANDOM REPETITION OF THE KEY
BASED ON THE"
2140 PRINT"CONTENTS OF THE PLAINTEXT."
2150 INPUTK#
2160 IFLEN(K#)>1THENPRINT"IT" :GOSUB5010
:GOTO2150
2170 PRINT"MINPUT A NUMBER UPTO 9
DIGITS LONG, IT"
2180 PRINT"WILL BE USED TO SUPERENCIPHER
THE FIRST"
2190 PRINT"STAGE ENCIPHERMENT PRODUCED
BY THE KEY"
2200 PRINT"TYPED IN EARLIER."
2210 INPUTR
2220 IFR>20THENR=SQR(R)+ASC(SIN(R))
:GOTO2220
2230 PRINT CHR$(147)
2240 DIMS$(255)
2250 PRINT"*****CALCULATING
SUPERENCIPHERMENT SEQUENCE*****"
2260 FORZ=1TOW
2270 R=((R+R)/5)-INT((R+R)/5)
2280 V=INT(R*100)
2290 IFV>90THENV=V-10
2300 IFV<65THENV=V+25:GOTO2300
2310 S$(Z)=CHR$(V)
2320 PRINTCHR$(V)
2330 C#=C#+S$(Z)
2340 NEXTZ
2350 FORA=0TOW50:NEXT
2360 PRINTCHR$(147):RETURN
3000 REM:***ENCIPHERING***
3010 P=P+1:IFP>LEN(Q#)THENP=1
3020 IF#="" THENP=1
3030 M=M+1
3040 IFM>LEN(MS#)THEN3100
3050 F=MID$(MS#,M,1)
3060 F=ASC(F#)
3070 IFF<65THEN3120
3080 F=F+ASC(MID$(Q#,P,1))-65
3090 IFF>90THENF=F-26
3100 C#=#+CHR$(F)
3110 GOTO3010
3120 F=F+ASC(MID$(Q#,P,1))-48
3130 IFF>57THENF=F-10:GOTO3130
3140 C#=#+CHR$(F)
3150 GOTO3010
3160 P=P+1:M=M+1
3170 P=P+1:M=M+1
3180 IFM>LEN(C#)THEN3300
3190 FF=MID$(C#,M,1)
3200 FF=ASC(FF#)
3210 IFFF<65THEN3260
3220 FF=FF+ASC(MID$(Q#,P,1))-65
3230 IFFF>90THENFF=FF-26
3240 CV#=#+CHR$(FF)
3250 GOTO3170
3260 FF=FF+ASC(MID$(C#,P,1))-48
3270 IFFF>57THENFF=FF-10:GOTO3270
3280 CV#=#+CHR$(FF)
3290 GOTO3170
3300 PRINTCHR$(147)
3310 PRINT"*****THE CIPHERTEXT IS:-" :PRINT
3320 V=0
3330 FORL=1TOW
3340 FORL=1TOW
3350 V=V+1
3360 PRINTMID$(CV#,V,1)
3370 IFV=LEN(CV#)THEN7010
3380 NEXTL
3390 PRINT " "
3400 NEXTK
3410 GOTO3330
4000 REM:***DECIPHERING***
4010 P=P+1
4020 M=M+1
4030 IFM>LEN(MS#)THEN4150
4040 F=MID$(MS#,M,1)
4050 F=ASC(F#)
4060 IFF<65THEN4110
4070 F=F-ASC(MID$(Q#,P,1))+65
4080 IFF<65THENF=F+26
4090 C#=#+CHR$(F)
4100 GOTO4010
4110 F=F-ASC(MID$(Q#,P,1))+48
4120 IFF<48THENF=F+10:GOTO4120
4130 C#=#+CHR$(F)
4140 GOTO4010
4150 P=P+1:M=M+1
4160 P=P+1:IFP>LEN(Q#)THENP=1
4170 IFFF=ASC(K#)THENP=1
4180 M=M+1
4190 IFM>LEN(C#)THEN4310
4200 FF=MID$(C#,M,1)
4210 FF=ASC(FF#)
4220 IFFF<65THEN4280
4230 FF=FF-ASC(MID$(Q#,P,1))+65
4240 IFFF<65THENFF=FF+26
4250 IFFF>88THENFF=160
4260 CV#=#+CHR$(FF)
4270 GOTO4160
4280 FF=FF-ASC(MID$(Q#,P,1))+48
4290 IFFF<48THENFF=FF+10:GOTO4290
4295 CV#=#+CHR$(FF)
4300 GOTO4160
4310 PRINT CHR$(147)
4320 PRINT"*****THE PLAINTEXT IS:-" :PRINT
4330 PRINTCV#
4340 GOTO7190
5000 REM:***ERROR SOUND***
5010 POKE54295,0:POKE54296,15
5020 Q=54272-POKE0+6,240
5030 POKE0+1,4:POKE0+5,0:POKE0+4,33
5040 FORC=1000T01005
5050 POKE0+1,C/256:POKE0,CAND255
5060 NEXTC
5070 POKE0+4,0
5080 RETURN
6000 REM:***TEXT LENGTH WARNING***
6010 POKE54295,0:POKE54296,15
6020 Q=54272
6030 POKE0+6,0:POKE0+5,10:POKE0+1,250
6040 POKE0+3,50
6050 POKE0+4,0:POKE0+4,65
6060 POKE0+4,35
6070 RETURN
7000 REM:***PRINTER OPTION***
7010 PRINT"PRINT:PRINT" DO YOU WANT
A PRINTED COPY? (Y/N)"
7020 GET# : IF#="" THEN7020
7030 IF W="N" THENRUN
7040 IF W<>"Y" THENGOSUB5010:GOTO7020
7050 OPEN4,4
7060 V=0
7070 FORL=1TOW
7080 FORL=1TOW
7090 V=V+1
7100 PRINT#4,MID$(CV#,V,1)
7110 IFV=LEN(CV#)THEN7160
7120 NEXTL
7130 PRINT#4," "
7140 NEXTK
7150 GOTO7070
7160 CMD4
7170 CLOSE2
7180 RUN
7190 PRINT"PRINT:PRINT" DO YOU WANT
A PRINTED COPY? (Y/N)"
7200 GET# : IF#="" THEN7200
7210 IF W="N" THENRUN
7220 IF W<>"Y" THENGOSUB5010:GOTO7200
7230 OPEN4,4:CMD4
7240 PRINT#4,CV#
7250 CLOSE4
7260 RUN

```




PLUS CLUB

— 20% Discount on Software
— 10% Discount on selected hardware

BARCLAYCARD
VISA

All prices include VAT. Your annual subscription guarantees 20% discount off all new titles added to our list (updated weekly). If you do not wish to join the club, any title may be ordered at the standard price.

SOFTWARE

COMMODORE 64 SOFTWARE

	Standard	Membership
	Price	Price
334 Valhalla	14.95	11.96
333 Hulk	9.95	7.96
333 Hulk	9.95	7.95
332 Contract Bridge	9.95	7.96
331 Caverns of Khafka	8.95	7.16
330 Golf	5.95	4.76
328 Chuckie Egg	7.90	6.32
327 Cavelon	6.90	5.52
326 Beach Head	8.95	7.16
325 Gyropod	7.95	6.36
324 Son of Bagger	7.95	6.36
323 Zodiac	7.95	6.36
322 Flight Path 737	7.95	6.36
320 3D Hypermaths	7.95	6.36
319 BMX Number Jump	7.95	6.36
318 Word Wobbler	7.95	6.36
317 First Steps with the Mr Men	8.95	7.16
316 Bath Time	7.95	6.36
310 Harrier Attack	6.95	5.56
308 Ultrasynth 64	14.95	11.96
307 Solo Flight	14.95	11.96
288 Space Pilot	7.95	6.36
281 Grand Master	17.95	14.36
279 Colossus Chess 2	9.95	7.96
273 Lord of the Balrogs	6.95	5.56
272 Wheelin Wallie	7.00	5.60
271 Scuba Dive	6.95	5.56
270 Get off My Garden	7.00	5.60
269 My Secret File	9.95	7.96
267 Lazarian	9.99	7.99
265 Pinball Spectacular	9.99	7.99
258 Beginners Basic	14.94	11.96
257 Beginners Assembly	14.95	11.96
250 Twin Kingdom Valley	9.50	7.60
248 Grand Master	17.95	14.36
246 Open Sesame	9.95	7.96
242 Just A Mot	9.95	7.96
241 Blue Moon	7.95	6.36
239 Bug Blaster	£7.95	6.36
233 Mr Wimpy	6.90	5.52
228 Ugh	7.95	6.36
222 Hunchback	6.90	5.52
220 Metro Blitz	7.95	6.36
219 Besieged	9.95	7.96
218 Database	24.00	19.20
217 Transact	30.00	24.00
213 Paratroopers	5.99	4.79
202 Damsel in Distress	7.95	6.36
201 Bat Attack	7.95	6.36
192 Zappy Zooks	6.99	5.59
170 Aztecomb Adventure	7.95	6.36
169 Everest Ascent	6.50	5.20
164 Hexbert	7.95	6.36
154 Clowns	9.99	7.99
153 Seawolf	9.99	7.99
152 Radar Rattrace	9.99	7.99
149 The Hobbit	14.95	11.96
146 Aquaplane	7.95	6.36
145 Purple Turtle	7.95	6.36
136 Depth Charge	4.99	3.99
131 Pacakuda	4.99	4.79
124 Cyclons	5.99	4.79
123 Centropods	5.99	4.79
122 Escape — MCP	5.99	4.79

SPECTRUM SOFTWARE

	Standard	Membership
	Price	Price
423 Lords of Midnight	9.95	7.96
417 World Cup Football	6.95	5.56
416 Phantastic Diamonds	7.95	6.36
414 Psytron	7.95	6.36
413 Chuckie Egg	6.90	5.53
412 Junior Wordsplits	9.95	7.96
411 Jack in Beanstalk	5.95	4.76
410 Mugsy	6.95	5.56
409 Blade Alley	5.95	4.76
408 Ad Astra	5.95	4.76
407 Code Name Mat	6.95	5.56
398 Trashman	5.95	4.76
397 Jet Set Willy	5.95	4.76
396 Hurg	14.95	11.96
395 Supercode	9.95	7.96
389 The Birds & The Bees	5.95	4.76
388 Night Gunner	6.95	5.56
387 Bear Bowyer	6.95	5.56
386 Chequered Flag	6.95	5.56
377 Fred	6.95	5.56
375 The Snowman	6.95	5.56
368 1994	6.95	5.56
353 Fighter Pilot	7.95	6.36
346 Scuba Dive	5.95	4.76
318 Cyber Zone	7.50	6.00
313 Domsday Castle	6.50	5.20
309 3D Lunar Crabs	6.95	5.56
307 Starclash	6.95	5.56
304 Stonkers	5.50	4.40
303 Krakatowa	5.95	4.76
299 Hot Dot Spotter	7.95	6.36
298 Count About	7.95	6.36
297 Lift Off	7.95	6.36
296 Grammar Tree —		
Verbs/Adverbs	10.95	8.76
295 Invasion Body Snatch	7.50	6.00
292 Spall!	5.50	4.40
285 Transversions	5.90	4.72
280 The Quill	14.95	11.96
279 Games Designer	14.95	11.96
277 Corridors of Genon	5.95	4.76
275 Valhalla	14.95	11.96
269 Grammar Tree —		
Nouns/Adjectives	10.95	8.76
258 Quazer	5.95	4.76
255 Time Traveller	9.95	7.96
243 Jungle Fever	6.95	5.56
223 Pool	5.95	4.76
208 Devils of the Deep	6.50	5.20
206 Bedlam	5.95	4.76
196 Killer Kong	5.95	4.76
195 Shuttle	5.95	4.76

BBC SOFTWARE

	Standard	Membership
	Price	Price
273 Fortress	8.95	7.16
271 Frak	8.95	7.16
270 Battle Tanks	7.95	6.36
269 Eagle	7.95	6.36
268 Free Fall	9.95	7.96
267 JCB Digger	9.95	7.96
266 Carousel	9.95	7.96

265 Bagger	7.95	6.36
264 Quick Thinking	6.95	5.56
263 Record Keeper	13.80	11.04
262 Disk Doctor	38.39	36.71
261 Graphics Rom	32.20	25.76
260 Dr Who	10.00	8.00
251 Grammar Tree	10.95	8.76
250 Open Sesame	9.95	7.96
249 Arrow of Death (Part 2)	9.95	7.96
248 Arrow of Death (Part 1)	9.95	7.96
246 Johnny Reg	6.95	5.56
245 Personal Money Manage	11.90	9.52
244 Microtext	49.85	39.88
243 Unorthodox Engineer	9.95	7.96
242 My Secret File	9.95	7.96
241 Beginners Assembly	14.95	11.96
240 Advanced Basic	14.95	11.96
239 Beginners Basic	14.95	11.96
238 The Grammar Tree	10.95	8.76
237 Just A Mot	9.95	7.96
236 Junior Wordsplit	9.95	7.96
235 Tenise French	9.95	7.96
230 Music Synthesizer	9.50	7.60
216 Zarm	6.95	5.56
213 Toolbox	20.99	16.79
212 Vu-Type	16.10	12.88
211 Missile Base	9.95	7.96
210 Super Invaders	9.95	7.96
209 Countdown to Doom	9.95	7.96
208 Liberator	9.95	7.96
207 Missile Command	9.95	7.96
206 Chess	9.95	7.96
203 Swarm	8.95	7.16
202 Android Attack	8.95	7.16
197 Printer Drivers	9.95	7.96
196 Magic Garden	9.95	7.96
191 The Hobbit	14.95	11.96
188 Starter Wordsplits	9.95	7.96
187 BCPL Prog Language	99.65	79.72
186 Starship Command	9.95	7.96
182 Attack on Alpha Centauri	7.95	6.36
181 Time Traveller	9.95	7.96
180 Besieged	9.95	7.96
173 Galaxy Wars	7.50	6.00
170 Wolf Pack	7.95	6.36
169 747 Flight Simulation	7.95	6.36
168 Invaders	6.95	5.56
150 Wordpower	9.95	7.96
149 Beeb-Art	14.95	11.96
148 Chess	11.50	9.20
146 Gunsmoke	7.95	6.36
144 Oille Octopus Sketchpad 6.95		5.56
143 Music Processor	14.95	11.96
140 Model B Invaders	7.50	6.00
138 Stratobomber	7.50	6.00
132 Forth	16.85	13.48
131 Lisp	17.08	13.66
127 Word Hunt	11.90	9.52
125 Missing Signs	11.90	9.52
123 Sentence Sequencing	11.90	9.52
121 Business Games	9.95	7.96
117 Super Invaders	9.95	7.96
116 Chess	9.95	7.96
114 Moleons	9.95	7.96
113 Arcade Action	11.90	9.52
112 Desk Diary	9.95	7.96
108 Monsters	9.95	7.96
107 Rocket Raid	9.95	7.96
103 Sliding Block Puzzles	9.95	7.96
102 Games Compendium	7.95	6.36

HARDWARE

COMPUTERS

BBC Model B with cassette recorder & 4 tapes	£399.00
Commodore 64 with recorder, 4 Commodore tapes & Quickshot II	£249.95
Commodore SX64 & MPS 810 Printer, Easy Script	
Easy File & Future Finance	£799.00
Adam Computer, includes CPU, Printer, High Speed Data Recorder & 3 Games	£525.00
Einstein Computer	£499.00
Memotech MTX 500	£240.00
Spectrum 48K	£129.95
PRINTERS — Price includes cable for most micros	
Silver Reed daisywheel	£320.00

Smith Corona TP I/E Daisy Wheel (state whether parallel or serial required)

Quendata DWP 1120 Daisywheel	£249.95
Epson FX80	£269.95
Epson RX80 F/T	£410.00
Epson RX80	£265.00
Cannon PW 1080A	£239.00
Commodore MPS 801 (includes Easy Script & Games Dish)	£315.00
	£199.95

DISK DRIVES

BBC, LVL 100K Drive	£199.95
Commodore 1541 (includes Easy file & intro to Basic)	£199.95
(many more stocked, please ring for details)	

MONITORS

Microviltac 1431 MS4	£220.00
Yanpen GM 1211 12" Mono 6 deg tilt, 30 deg swivel, amber or green	£119.00

ACCESSORIES

Quickshot II	£10.00
Prolink BBC Joystick interface	£9.95
Wizard BBC Joystick interface (analogue part)	£14.95
Cambridge Programmable Joystick interface (for Spectrum)	£22.90
Tripler 64 (Commodore to centronics)	£45.00
Vixen 16K Switchable Rom for VIC20	£39.95
DK Tronic Keyboards for Spectrum	£45.00
Many other items stocked — please phone for details	

We cannot list all products, please phone 0225-61676 or 63094 for more details.

Send orders to PLUS CLUB, 12 York St, Bath, Avon. BA1 1NG. If paying by Access/Barclaycard, we can accept telephone orders on 0225-61676 (24 hour answer service)

Please supply me with

Make of Micro

Price

Name.....

Address.....

1.....

2.....

3.....

4.....

5.....

6.....

Add delivery for hardware (delete in not applicable. Free if paying by postal order or cheque)

Add subscription (if ordering at club prices)

TOTAL

8.00

10.00

Signed.....

I enclose cheque/P.O for

£.....payable to Plus Club

Please debit my Access/Barclaycard

No.....

Prices apply to UK only

We aim to supply items by return, but please allow 10 days for delivery.

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed.

Inspector

on Oric/BBC

They are both versions of the same program, and are a utility program designed to allow the user to examine the contents of memory in an easy to read fashion.

Although differing widely in length and style, both programs perform the same tasks, and result in the same screen format. Typically I use these programs to browse

through the contents of Rom or, more commonly, to 'cheat' at adventure games, by finding out what words etc. the game will respond to.

Program notes

First load the program you wish to examine. Then load *Inspector* and run it. The limitations of the Oric mean that, without some fancy relocation techniques applied to the first program, *Inspector* will overwrite a small part of it.

On running, the program asks for the address of the first byte you wish to

examine. This can be entered in decimal — ie, 3567, or in hex ie, #400. Pressing the spacebar takes you back to this input when the program is running in order to allow you to look elsewhere. Pressing CNTRL C will halt the program.

BBC

Oh, the joys of BBC Basic! To achieve the same results on the Beeb I didn't have to mess about with all those strings and so the program fits or just 5 lines.

First, load the program you wish to examine at &EOO. Then type Page = (some value higher than EOO + the length of the program + some for luck) and *Chain Inspector*. Answer EOO to the prompt (you don't need the '&') and away you go. Pressing any key restarts the program, and *Escape* will stop it.

```

LIST
  IREM      BBC INSPECTOR
            Jeff Tullin 1984

  2
  3
  10 INPUT "START ADDRESS IN HEX "; ST$: ST
  = EVAL("&" + ST$)
  20 @x = 5: PRINT ~ST; " "; @x = 3: FOR B = 0 TO
  7: A = ?(ST + B): PRINT ~A; : NEXT: PRINT " "; : FOR
  C = 0 TO 7: D = ST + C: D = ?(D)
  30 IF (D > 31 AND D < 127) VDU D: ELSE VDU 46
  40 NEXT: PRINT: ST = ST + 8: IF INKEY$(2) < ">"
  THEN 10
  50 GOTO 20
>
  0 REM "ORIC INSPECTOR
    by Jeff Tullin 1984"
  10 :
  20 INPUT "START ADDRESS "; ST
  30 B$ = HEX$(ST)
  40 IF LEN(B$) < 5 THEN B$ = B$ + " "
  50 IF LEN(B$) < 5 THEN B$ = B$ + " "
  60 IF LEN(B$) < 5 THEN B$ = B$ + " "
  70 IF LEN(B$) < 5 THEN B$ = B$ + " "

  80 B$ = MID$(B$, 2, 4)
  90 PRINT B$; " ";
  100 FOR B = 0 TO 7
  110 A = PEEK(ST + B): A$ = HEX$(A)
  120 IF LEN(A$) < 3 THEN A$ = A$ + " "
  130 IF LEN(A$) < 3 THEN A$ = A$ + " "
  140 IF LEN(A$) < 3 THEN A$ = A$ + " "
  150 A$ = MID$(A$, 2, 2)
  160 IF B$ = " " THEN A$ = "00"
  170 IF A < 16 THEN A$ = "0" + LEFT$(A$, 1)
  180 PRINT A$; " ";
  190 NEXT
  200 FOR C = 0 TO 7
  210 D = ST + C: D = PEEK(D)
  220 IF (D > 32 AND D < 91) OR (D > 96 AND D <
  23) THEN PRINT CHR$(D); : GOTO 240
  230 PRINT ". ";
  240 NEXT: PRINT
  250 E = FRE("")
  260 ST = ST + 8
  270 IF KEY$ < ">" THEN 20
  280 GOTO 30

```

Inspector
by Jeff Tullin

Cryonics Care

on Spectrum

This is a sort of follow up to "Long dimensional resurrection" published some months ago and is based on Sinclair principles in 1964, Robert C.W. Ettinger wrote a book called *The Prospect of Immortality* (Sidgwick and Jackson 1966, £1.25). In it, he suggested that shortly after the end of the lifetimes of those now living, science would have advanced sufficiently

to make ageing reversible and death optional. People could reach this time by means of having their remains frozen.

Full instructions are incorporated within the game, but the basic idea is to set off mines under approaching cars. The game seems ridiculously easy when started, but difficulty soon builds up, and some dexterity and skill is needed to complete it.

Program notes

Lines 1 to 11 Are instructions and initialisation.

Lines 22 to 24 Set up the Facility, represented by a vertical bar with a name written on it.

Line 26 Produces random characters for explosions.

Line 30 Prints a minefield and sets mine array.
Lines 1000 to 1060 Are the sub loop that advances the cars and detects keypresses and explodes mines etc.
Line 1000 Scans whether there is a car present, and if not recycles unless firing routine called.
Line 1010 Detects whether a car has reached the target and if so resets the game.
Line 1020 Advances cars on a random basis.
Line 1022 Detects whether mine exploding has been requested, and if not goes on to ask whether firing routine is called.
Lines 1024 to 1028 to explode the mines and cars if present.
Lines 1032 to 1038 fire the ray.

```

1 FOR f = USR "a" TO USR "d": R
EAD f1: POKE f, f1: NEXT f
2 DATA 0, 0, 1, 63, 127, 255, 127, 2
4, 127, 136, 8, 255, 255, 255, 255, 0, 19
2, 32, 48, 248, 252, 255, 254, 24, 0
3 LET test = 0: FOR f = USR "d" T
O USR "f": READ f1: POKE f, f1: L

```

```

ET test = test + f1: NEXT f: BORDER
3: IF test < 1914 THEN PRINT "da
ta error": STOP
4 DATA 255, 63, 31, 15, 7, 3, 1, 0, 2
55, 252, 248, 240, 224, 192, 128, 0, 0
5 PRINT "PAPER 4;" CRYO
NICS CARS You are inc

```

charge of security at Spectrum Cryonics Ltd. You are under attack from a rival organisation who are trying to crash cars into the front of the storage facility. However, the approaches are mined. You can set off a m

Open Forum

ine by pressing its number. You can also use a ray which fires across the front of the facility. This ray only disables, and therefore a disabled car can act as a shield for another.

As the game progresses, there are more cars. Scoring is for each hit, increasing with difficulty. Use of the ray reduces score. If a car gets through, the no of

6 PRINT PAPER 4; "cars and the scoring rate are reduced. Mine 10 is a '!' "

7 INPUT BRIGHT 1; PAPER 5; "Are you ready to play?" : a\$

8 REM "Cryonics" is (c) Reeves Telecommunications Laboratories Ltd 1982. A copy of this program is available with many others on the "Porthtowan Combo Tape" priced £4 from the company at West Towan House, Porthtowan, Truro, Cornwall TR4 BAX

10 PAPER 6: BORDER 7: DIM c(10): DIM m(10): DIM c\$(22): LET sc

ore=0
11 LET diff=1
13 IF diff<1 THEN LET diff=1:
REM loop return point.
20 CLS: FOR f=1 TO diff: LET
c(f)=28: NEXT f
22 LET c\$="SPECTRUM CRYONICS L
TD"
24 FOR f=0 TO 21: PRINT AT f,1
: PAPER 4; c\$(f+1): NEXT f
26 FOR f=USR "f" TO USR "j": P
OKE f,255*RND: NEXT f
30 FOR f=1 TO diff: LET m(f)=7
+INT (RND*13): PRINT AT f*2+1,m
(f); "D"; CHR\$(f+48); "E": NEXT f
1000 FOR f=1 TO diff: IF c(f)=0
THEN GO TO 1030
1002 LET flag=1
1010 IF c(f)=1 THEN LET diff=di
ff-1: GO TO 13
1020 IF RND>.5 THEN BEEP RND*.0
1,RND*.01: LET c(f)=c(f)-1: PRIN
T AT f*2,c(f): INK 2; "ABC "
1022 LET mine=CODE (INKEY\$)-48:
IF mine<1 OR mine>diff THEN GO
TO 1030
1023 IF m(mine)=0 THEN GO TO 10
30

1024 PRINT AT mine*2+1,m(mine); "
": GO SUB 9000
1026 IF ABS (c(mine)-m(mine))<2
THEN PRINT AT mine*2,c(mine); F
LASH 1; "GHI": GO SUB 9000: PRINT
AT mine*2,c(mine); " ": LET c(
mine)=0: LET score=score+diff
1028 LET m(mine)=0
1030 IF INKEY\$<>"F" AND INKEY\$<>
"f" THEN GO TO 1039
1032 FOR g=21 TO 1 STEP -1: PRIN
T AT g,2: INK 3; BRIGHT 1; "█"
1034 IF SCREEN\$ (g-1,2)=" " THEN
GO TO 1037
1036 PRINT AT g-1,2: INK 3; FLAS
H 1; "ABC": LET c((g-1)/2)=0: LET
score=score-2*diff: GO TO 1038
1037 NEXT g
1038 FOR h=21 TO g STEP -1: PRIN
T AT h,2; " ": NEXT h
1039 PRINT AT 0,10; "Score = "; sc
ore; " ": NEXT f
1040 IF flag=0 THEN LET diff=di
ff+1: IF diff=11 THEN LET diff=
10
1050 IF flag=0 THEN GO TO 20
1060 LET flag=0: GO TO 1000
9000 BEEP 1,1: RETURN

Cryonics Care
by J de Rivaz

Arcade Avenue

Tropical maze

The big news for Spectrum owners at the moment is, of course, the release of *Sabre Wulf* by Ultimate. This 48K game is a departure for Ultimate since it has been released at a pricy £9.95, supposedly to recompense the company for its 'increased development time'. I am sure most people will feel the game is worth the extra — there's so much average software about these days that is already hitting the nine or ten pound mark — in fact the only real surprise is that Ultimate's first two 48K games were any cheaper.

The theme of this game is similar to *Atic Atac*, but set in a tropical jungle. You have to run around a maze (much more claustrophobic than *Atic Atac*) which 'pages' rather

than scrolls as you move off the screen, killing some nasties, dodging others and collecting various items which help you gain points, survive attack and eventually escape. The graphics are, as ever, superb with incredibly detailed backgrounds and wonderful animation.

Doubtless in later weeks we will be coming back to this game with various high scores, hints and tips (so hurry up and send them in). However, imagine my surprise when no less than three letters appeared within days of the release by people who had completed the game.

Colin Watts of Newcastle-Upon-Tyne has scored 93,280 and finished the game with 65% completed. He finished it on 11 June and passes on the tip for people who are trying to map the jungle — it has 16 x 16 screens and the start screen is six up from the bottom and

nine from the left.

Colin was however pipped by Mr S Dowd, also of Newcastle, whose letter was dated 8 June and who finished with a score of 89,250 and a previous best of 114,000. But the champion, so far, is Des Claypole of Peterborough who on 7 June wrote with a finishing score of 124,405 and 80%, and a high score of 190,060 and 90%.

Incidentally like *Atic Atac*, the score and % are reflections of how many screens you have covered, objects collected, etc. I think it is just as challenging to try and finish with a low % as with a high one.

All three gave proof of completion by relating details of Ultimate's follow up game in the *Sabre Man* series which is revealed on completion of *Sabre Wulf*. This new game, to be called *Underworld*, will be developed using the same Operating System and I pre-

sume continues from where *Sabre Man* enters the Cave mouth.

Finally, on the subject of new releases for the Spectrum, I hope *Sabre Wulf* doesn't obscure the superb *Tornado Low Level* from Vortex (of *Android 2* fame). This new game is fun, addictive and graphically superb. As you fly your jetplane over a rocky landscape, diving low under telegraph lines and flying around houses and trees to hit the target, the shadow of the plane adjusts perfectly to the varying terrain. It is one of the best 30 games I have seen and should not be missed.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to: Tony Kendle, Arcade Avenue, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Assimilate. And Stimulate.

From Sunshine, a book all about simulation techniques on Sinclair's new QL, written with the unique benefit of actual QL experience. Many entertaining, intriguing chapters explain how you can get your QL to output what you need, to help your hobby, your business – or your curiosity. Inside, you'll find how to develop the ability to fully analyse problems and confidently develop your own simulations. And you'll be able to stretch the potential of your new QL to the limits.

Using our modelling techniques you can create an economic model, or a flight simulator. You can engineer a more efficient engine, or manage a project better. All on your QL, with the help of this vital new book, *An Introduction to Simulation Techniques on the Sinclair QL*.

Order today, using the coupon or from your local bookshop or computer dealer.



Please send me the *Introduction to Simulation Techniques on the Sinclair QL* at £6.95 ISBN 0 946408 45 9.



- ☐ I enclose a cheque for £_____ payable to Sunshine Books.
- ☐ I enclose a postal order for £_____ payable to Sunshine Books.
- ☐ Please charge my Visa/Access card No. _____ valid from _____ expires end: _____

Signed: _____

Name: _____

Address: _____

Send to: Sunshine Books,
12/13 Little Newport Street, London WC2R 3LD.

Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-437 4343.



commodore

FASTBACK IS HERE

A TYPICAL COMMODORE 64
OWNER WAITING FOR A
PROGRAM TO LOAD FROM
TAPE... BUT NOT ANY MORE!

At last a utility that provides fast-loading. **FASTBACK** allows multi-part software to load around **10 TIMES FASTER** and run independently of the utility. For example: load 'The Hobbit' in 150 seconds with **FASTBACK**.

Supplied on tape with full instructions.

ONLY £9.95

AND FOR DISCO

Our latest and most sophisticated Tape-to-Disc utility is so easy even a child can use it. **DISCO** creates its own buffer steps to ease the job of transfer. All programs auto run once transferred. We guarantee this is the best Tape-to-Disc you can buy.

Supplied on tape with full instructions

ONLY £9.95

THE AMAZING NEW PROGRAM FOR THE 64

Gives unlimited vocabulary and can be incorporated into your own programs using "SPEAK" as a basic command.

ONLY £7.95 NOW YOUR TALKING!

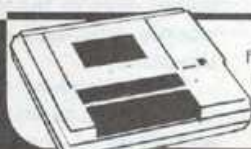
-TAPE TO DISK TRANSFER UTILITIES-

Transfer games etc. to disk. Supplied on tape with full instructions for:-

BBC

ATARI (All models)

£9.95



DATA RECORDER

From the same factory as the C2H – the Super Saver 20/64 Data Recorder (no interface required)

£29.95

HUGE RANGE OF SOFTWARE & BOOKS FOR BBC, ELECTRON, SPECTRUM, COMMODORE 64, VIC 20, ORIC, DRAGON, MEMOTECH & ZX 81

Trade and Overseas Orders welcome. All prices inclusive. Send Cheque, P.O., Bank Draft or phone your Card Number to 0386 49641.



MICRO CENTRE
BRIDGE STREET, EVESHAM,
WORCESTERSHIRE
Tel: 0386 49641

MICRO CENTRE
1756 PERSHORE ROAD,
COTTERIDGE, BIRMINGHAM.
Tel: 021-458 4564

Circles

on BBC

This procedure is designed to be used within another program. The procedure itself does not refer to any line numbers and all variables outside that of the parameters are local.

The actual functions of this circle drawing utility are:

a) Draws circles at any screen position.

b) Any width or height of circle can be drawn.

c) The start and finish point of the drawing can be specified in degrees, so that ellipses can be drawn.

d) The circle can be filled.

e) The circle can be drawn or filled in any colour depending on the mode.

How to use it

Proccircles (300,300,100,400,0,360,"FILL",3)

This will draw a circle at co-ordinates 300,300 of width 100, height 400. Also it will Fill it in. The colour being yellow (3) providing it is in Mode2.

It has drawn a full circle because the start and finish was specified as being 0 and 360, ie, if they were specified as being 90f and 270 it would draw a semi-circle. If you do not want to fill the circle or ellipse then put "NoFill" into the speech marks instead of "Fill".

```
10DEFPROCcircle(X,Y,width,height,start,finish,fill$,colour).
20LOCALfill,xcor,ycor,AN,angle
30IFfill$="FILL"THENfill=TRUE ELSE fill=FALSE
40GCOL0,colour
50VDU29,X;Y;
60MOVE0,0:MOVESIN(RAD(start))*height,COS(RAD(start))*width
70FORAN=start TO finish
80angle=RAD(AN)
90xcor=SIN(angle)*height
100ycor=COS(angle)*width
110IF fill THENMOVE0,0:PLOT85,xcor,ycor ELSE DRAWxcor,ycor
12ONEXT
130ENDPROC
```

Circles

by P Venables

Microradio

GW6JJN



The other parts

An attempt now to catch up with some of the new software in the radio computing field.

A letter received from Pinehurst Data announces a Spectrum version of their original Morse Code reading program for the ZX81 that was reviewed a few weeks ago in Microradio. To this day I am amazed at how that program was contained in an unexpanded ZX81.

Also from Pinehurst Data comes a macro construction and animation program for the Spectrum. This will enable the user to create animated scenes or cartoons of up to fifteen minutes duration which will certainly appeal to the amateur television enthusiasts. Contact Pinehurst Data at 69 Pinehurst Park, West Moors, Wim-

bourne, Dorset, for more information. I hope to review these two programs soon in Microradio.

Once again Grosvenor Software has been extremely busy with the release of three new Radio Teletype (RTTY) receive and transmit programs for the Vic 20, the Commodore 64 and the Acorn Atom. Following on from their incredible RTTY program for the Dragon reviewed in Microradio some months ago, Michael Kerry G4BMK in the shape of Grosvenor Software has probably done more than anyone else in making this fascinating mode of communication possible. Combined with Roger Barker of G4IDE Microsystems, who has done the same for the Spectrum, Radio Teletype is now available cheaply for the most popular machines on the market. The new Grosvenor programs will be reviewed in a future Microradio but further information can be obtained from Grosvenor Software, 22 Grosvenor Road, Seaford, East Sussex BN25 2BS.

Radio teletype, for all those people writing to me hearing the term for the first time, is a

form of communication used by radio amateurs, news agencies, satellites and various other marine and commercial users for instant communications on both shortwave and VHF radio. If you tune into a software radio transmission you will often hear noises rather like a computer cassette being played. The chances are that this is radio teletype or RTTY as it is known. All that you need is your micro, a radio receiver, a simple interface (interface not required for the Dragon) and a simple RTTY software program and you can tune the radio and receive all sorts of interesting stuff displayed in plain English (or any other language) on your TV. This is certainly the cheapest and easiest way to interface your micro to the real world. And computer games never seem quite the same afterwards.

Ken Dutton of Dingwall, Ross-shire writes asking how to get into radio computing, pointing out that he has a BBC micro. The best advice I can offer Ken, is to point you in the direction of Ramtop, the radio-computing users group who

deal with several micros but especially the BBC. Ramtop can be contacted at Great Billing Rectory, Great Billing, Northampton. For those people with Sinclair micros interested in radio computing, the user group is Sarug, 3 Red House Lane, Leiston, Suffolk. I must ask anyone contacting user groups to include a stamped addressed envelope to be sure of a reply. The same goes for letters to Microradio, of course.

Memotech users interested in radio-computing will find a sympathetic ear in the shape of Dave West, 129 Old Stoke Road, Aylesbury, Bucks HP21 8DG who wants to contact like-minded Memotechers.

Finally, I have just received a letter to Microradio from Thessalonika in Greece. Which just goes to show that PCW refreshes the parts that other magazines cannot reach.

Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, Microradio, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



16K ZX81
Here is a selection of titles still available for ZX81. Send s.a.e. for illustrated catalogue. These are the ZX81 equivalents of the Spectrum programs described above. Although similar in concept the specifications fall short of the descriptions given for the Spectrum.

"FOOTBALL LEAGUE"
Forerunner of "Day of the Match" £4.00

"TEST MATCH"
Forerunner of "Ball by Ball" £4.00

VIDEO SOFTWARE LTD.,
Stone Lane, Kinver,
Stourbridge, West Midlands
Telephone: 0384 872462

SOFTWARE FOR SPECTRUM AND ZX81

48K SPECTRUM
"Day of the Match" £5.00
Fascinating and realistic simulation of an entire football season. Name your own teams if you wish (English league provided on cassette). Rate each team from one to nine in various success categories such as attack, defence, manager, etc. Watch the season unfold, includes knock-out option.

"Ball by Ball" £5.00
Simulates a test match series of one day international series. Set up your own teams and pool of players (England v Australia provided). Rate each player's capabilities as batsman and bowler on a one to nine scale for qualities such as talent, effort etc. Pick your teams and play the match. Electronic scoreboard shows progress of a match. Full supporting score card and series averages.

VIDEO SOFTWARE LIMITED

SPECTRUM SOFTWARE CLUB!

LOWEST-COST!

FREE CASSETTE!

- * Hire and Exchange games from just 50p
- * Buy new games at the best possible discounts
- * Hundreds and hundreds of games to choose from
- * Regular Newsletter with details of new releases etc
- * Every new member gets a FREE BLANK CASSETTE!
- * All the benefits of other clubs at HALF THE PRICE!
- * All cassettes original & supplied with owners permission

Send just £3.95 and we will rush you your
Membership Kit and, Free Cassette:-
SPECTRUM SOFTWARE CLUB, (pcw),
287-291 High Street, Epping, Essex, CM16 4DA.
(or send a stamp for catalogue)



Publishers of
Popular Computing Weekly,
Dragon User,
Commodore Horizons
and
Micro Adventurer

AUTHORS

Sunshine already publishes a highly acclaimed and best selling list of computer books.

But we are always looking for new ideas and new authors.

If you have an idea and think you could write a good book why not write to us and find out what we can offer?

David Lawrence, Book Editor, Sunshine,
12/13 Little Newport Street, London WC2R 3LD

THE MEGASAVE FANTASTIC SAVINGS

SPECTRUM	SPECTRUM	COMMODORE
SABLE WOLF.....8.25	BLUE THUNDER.....4.75	SON OF BLAGGER.....6.50
PSYTRON.....6.30	INFERNO.....5.50	BEACH HEAD.....8.50
MUGSY.....5.95	CODE NAME MAT.....5.20	VALHALLA.....11.50
JACK & BEANSTALK.....4.95	MILLIONAIRE.....4.50	QUILL.....8.50
FIGHTER PILOT.....6.25	SINK THE TITANIC.....6.75	LOGO.....5.55
TORNADO LOW LEVEL.....4.75	COSMIC CRUISER.....4.25	ARABIAN NIGHTS.....5.85
HULK.....8.50	WORLD CUP F'BALL.....5.95	SOLO FLIGHT.....12.00
LORDS OF MIDNIGHT.....8.50	FULL THROTTLE.....5.95	TRASHMAN.....6.65
KOSMIC KANGA.....5.10	QUILL.....10.75	STAR TROOPER.....5.75
BEAKY.....4.85	FACTORY BREAKOUT.....4.75	CAVELON.....5.55
AD ASTRA.....4.95	BLADE ALLEY.....4.75	ENCOUNTER.....8.75
NIGHT GUNNER.....5.50	3D LUNAR ATTACK.....4.75	HOUSE OF USHER.....5.85
TRASHMAN.....4.75	WORST T.H. AT SEA.....4.75	GILLIGAN'S GOLD.....5.85
MOON ALERT.....4.70	PYRAMID.....4.95	BLUE THUNDER.....5.95
ANTICS.....5.75	ANDROID II.....4.75	ANDROIDS II.....5.85
WARS OF THE WORLD.....6.75	AIR TRAFFIC CONTROL.....8.50	FLIGHT PATH 737.....6.30
LES FLICS.....5.50	MATCH POINT.....6.85	FOOTBALL MANAGER.....6.85
CAVELON.....4.95	STOP THE EXPRESS.....5.00	HEATHROW A.T.C.....6.85
ATACATAK.....4.75	3D TANK DUEL.....4.75	ORACLES CAVE.....5.85
AUTOMANIA.....5.75		GHOULS.....6.85

FREE POST PLEASE STATE WHICH MICRO
SEND CHEQUE/P.O. TO:
MEGASAVE Dept 1, 76 Westbourne Terrace, London W2

FAST SERVICE

WALTHAMSOFT '84

THE HOME COMPUTER SHOW FOR ALL
SATURDAY SEPTEMBER 8TH

10AM - 5PM

WALTHAM FOREST TECHNICAL COLLEGE
FOREST ROAD, LONDON E17

- LOTS OF FREE PARKING
- EASY BUS & TRAIN ACCESS
- REFRESHMENTS ALL DAY

FEW STANDS STILL AVAILABLE

PARTY BOOKINGS • STANDS • ENQUIRIES :-

LONDEX 38 EXETER GARDENS, ILFORD
ESSEX IG1 3LB. 01-554-5039/3498

**ADMISSION
£1**

**NEWTRENDS
TECHNOLOGY**



For your copy of "INSIDE
QUOTES" and QUICK REFERENCE
INSTRUCTION SHEET—
just fill in the coupon and send
together with cheque or Postal
Order for £1.00, made payable to
NEWTRENDS TECHNOLOGY, to:
NEWTRENDS TECHNOLOGY,
P.O. BOX 30, DURHAM DH1 4TU.
Please allow up to two weeks for
delivery
DEALER ENQUIRIES WELCOME

**VIC-20 and COMMODORE
64 OWNERS
PROGRAMMERS QUICK REFERENCE
TEMPLATE ONLY £1.00**

Inclusive of V.A.T., postage & packing
—A new easy-to-use aid for the novice
programmer—"INSIDE QUOTES" is a
template that fits neatly over your
keyboard to help you find colour, graphi,
and control commands. Whether you
are learning to programme on your own,
or just copying games from your
favourite magazine, you need "INSIDE
QUOTES"

NEWTRENDS TECHNOLOGY
I enclose cheque/P.O. for £.....
Please send me.....copies of "INSIDE
QUOTES"
NAME.....
ADDRESS.....
Postal Code.....

HISOFT PASCAL DEVPAC

Quality ZX SPECTRUM® Software
HISOFT PASCAL 4T

"... I haven't seen any other compiler that could match Hisoft's Pascal" ... Using the
Spectrum Micro - Autumn 1983

"This is a very impressive product... of benefit to any Spectrum programmer..." David
Bolton ZX COMPUTING Aug/Sept 1983

Just two comments from full length reviews of our powerful and virtually full
implementation of Standard Pascal. The advantages of using Pascal are well-known —
fast, self-documenting, and above all, structured programs and now, with Hisoft Pascal,
you can reap all these benefits on a wide range of home computers, including the 48K
Sinclair Spectrum! Hisoft Pascal produces programs that run typically 40 times faster than
equivalent ZX BASIC programs and, sometimes, up to 1,000 times faster!

Hisoft Pascal supports FOR... DO, WHILE... DO, REPEAT... UNTIL, CASE... OF,
INTEGERS, REALS, CHARACTERS, RECORDS, POINTERS, SETS, ARRAYS etc. etc. — it
is not a Tiny Pascal but a virtually full implementation of the language allowing the user to
develop true high-level language skills while attaining execution speed close to that of
machine code. Complete with a 70-page manual.

HISOFT DEVPAC 3

"... DEVPAC is most highly recommended. The documentation is first class." Your
Computer May 1983

"... if you write programs in machine code, buy DEVPAC — it is the best currently on the
market." Adam Denning, ZX SOFT in Which Micro September 1983

Two comments from reviews of earlier versions of DEVPAC — now we have DEVPAC 3
available: a powerful Z80 assembler with conditional assembly, assembly from tape (to
enable generation of very large code files), ORG, EQU, DEFB, DEFS, DEFW, DEFM,
labels of any length — in fact all you need for fast (3,000 lines per minute) and powerful
assembly programming. But it doesn't stop there: DEVPAC 3 also includes an incredible
debugger/dis-assembler giving you a "front panel" display of the Z80 system and allowing
extensive debugging of your machine-code program, including single-stepping programs
EVEN IN ROM!! Open up the secrets of low-level programming with DEVPAC 3.

Prices:
Hisoft Pascal 4T (ZX SPECTRUM) £25 inclusive
(NewBrain, SHARP MZ700 etc) £35 plus VAT
Hisoft DEVPAC 3 (ZX SPECTRUM) £14 inclusive
(NewBrain £25 inclusive)

STOP PRESS Hisoft Pascal for the SPECTRUM now comes complete with a
Turtle Graphics package allowing fast and easy production of complex graphic displays

HISOFT
180 High Street North
Dunstable
Beds LU6 1AT
Tel: (0582) 696421



Tony Bridge's Adventure Corner



A mighty mountain

Every day, a little gnome staggers through the streets of London, weighed down by the bulging sack on his back. What is he doing, this poor creature? Delivering all your letters to The Great Elf, that's what - a great pile each day, a small hill each week, a mighty mountain every month comes tumbling through the letterbox. Thus, it will come as no surprise to you when I say that I am very late in answering all your enquiries!

Hugh T Walker, of Guildford, is, I hope, a patient Adventurer... he wrote a number of letters to The Corner in March and April, and he seems to have had a lot of fun with several Adventures:

"I have solved *Planet of Death* and *Espionage Island*, both by Artic, and *Black Crystal* (by cheating! - it is in unprotected Basic) by Carnell. As for the sample adventure in *Dungeon Master*, from Crystal, I haven't the time to reach the ultimate grade - have you reviewed this one? It has the added bonus of being an Adventure-creation program, although it has not had the publicity which *The Quill* has received." (see my comparative review in *Micro Adventurer*, June issue.

"*Valhalla* - I think I need to be unemployed to solve this one. Boldir is a stropky so-and-so who won't do anything for me. I thought the answer to "Darkness to Midgard" was the dark building, but the ring was not there!

"*Pharaoh's Tomb* - I can't find all the treasure, and I can't put out the fire in the Fire Room" (Have you tried taking the ice here, Hugh?). Hugh goes on to mention

some of the books that he has read.

Invent and write games for the Spectrum, by Noel Williams (Noel is an excellent writer - watch out for a joint collaboration between him and the Grand Elf to be released shortly).

"*Dicing with Dragons* and the *Warlock of Firetop Mountain* series by Ian Livingstone. *Spectrum Adventures* by Tony Bridge and Roy Carnell (sounds familiar, and The Grand Elf can add another book to this list - *What is Dungeons and Dragons?*, by Butterfield, Parker and Honigmann.

Hugh then sent me several letters, over a few weeks, about *The Quest*, and his progress with the game. On my recommendation in The Corner, Col 3 No 6, he bought copy of *The Quest* and quickly knocked up 590 points, and the rating of Super Dungeon Master. "I had some problems with the *Save* routine (apparently, the volume settings during saving have to be very accurate, but just needs a little experimentation) - Hewson Consultants could not have been more helpful, phoning me back within a couple of days with the answer to my problems."

Anyway, Hugh goes on to describe *The Quest* in great detail - and it is obvious that he finds the game as absorbing as Alan and Daphne Davies did, back in Vol 3 No 6.

Since then, I have received many letters about this wonderful Adventure. Typical of the remarks made is this, by Des Claypole (oh, sorry, *Celebrimbor of the Gwaith-i-Mirdain* - well, that's what it says here!):

"This is, in my opinion, one of the best pieces of software available for the Spectrum. It contains all the ingredients of a great Adventure, with hi-res graphics, sophisticated sentence recognition, fast response, some tough puzzles and a lot of monster-bashing."

There are one or two problems that seem to crop up regularly in the letters I get. The first is how to get into Castle Oops. When at the door to the Castle, make sure that you have the long Key, and then try emulating Aladdin, and type *Open S* - at least, I would like to think that the program recognises the abbreviation as *Sesame*, and not *South*! And as a further hint, don't venture into the Castle without a mirror. To cross the river, you must have the Magic Ring, or else you will bive a list of the directions - the clue will take the form of a list of the numbers:

SOUTH: 1, NORTH: 2, WEST: 3, EAST: 4

Starting from the sign that says *Experimental Curved Space Excavation*, go: 2,2,2,3,3,2,2,3,3,4, and you will arrive at the well-oiled machine (just like PCW!), and then go 1,1, - now on to the forest, in which it is very easy to get lost. From the very start of the Adventure, keep going North until you reach a burrow. From here, go: 4,4,1,1,4,4,1, and you should get back to the track. Should you get lost in the forest, go: 4,4,1,1,4,4,1,1,3,3,3,3, and then carry on 2 to the burrow.

These clues were passed on to me by Glenn (Balrog Basher) Morgan, for which much thanks! Glenn has a number of other interesting things to say about *Quest*: as a tip to Ian Ritchie, who was stuck some weeks ago, type *Swims* (while wearing the ring as I said before), and Ian, bear in mind that after killing a monster, you may find that it will drop something that will come in handy. Glenn, along with several other *Questers*, finds that the Wizard actually doubled his luck when he paid him. *Quest* seems to getting a bit like *The Hobbit*, thanks to the rating system, in which the player gets given a score, as well as a name - I could only ever manage *Cave Crawler*, but Chris Baldwin of Merseyside, Ken Bolton of Yarnton, in Oxfordshire, Graeme Cushion of Doncaster and Christopher John Fox of Cardiff, have all attained 600 points. Christopher has a useful observation to make - you will only solve the Adventure if you score 590 points: the final scene will then unfold as long as you are standing in the right place, when you will be sent to a room in which there is a map.

Before I leave *Quest* (I will return to it, as it is a very promising Adventure), I must mention a letter that I received from Shirley Parker-Munn, down there in Powys. You'll forgive me for not discussing your letter in depth or detail, Shirley, but it was most interesting, and I'm glad to see that you are filling up your time with something interesting - and tell your eldest that he has got very good taste! Shirley has completed many Adventures, among which are *Quest*, *The Hobbit* the Artics, the *Mad Marthas*, Gilsoft's *Magic Castle*, *Diamond* and *Timeline* and would be very happy to help anyone else presently struggling - just send your queries to me (including an SAE as usual), and I will pass them along to her. Finally, Shirley, I hope to be among the first to see your efforts on the *The quill*!

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair - help is at hand.

Fill in the coupon, explaining your problem, send it to us, and a fellow adventurer may

be able to help.

Remember - the system only works if those adventurers who have solved the puzzles get in touch. Every week is *Save An Adventurer Today* (SAAT) week!

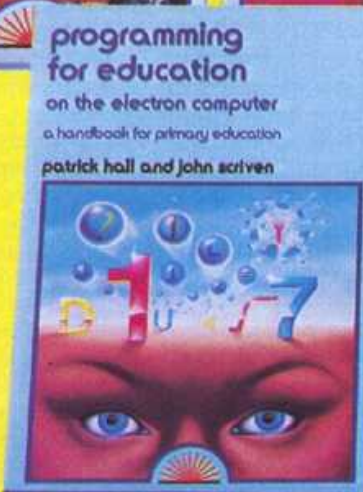
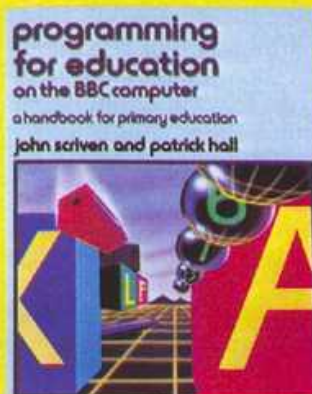
Adventure on (micro)
Problem

Name

Address

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further write to: Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

For BBC Micro and Electron Users



They turn micro users into big operators.

Sunshine's great books for the BBC and Electron help you make your favourite micro into a mighty machine.

Read, and discover how to program, to create music, to draw graphics, to do maths, to produce robots and even how to give your micro artificial intelligence.

Sunshine's best-sellers are at all good bookshops now. Or order, using the coupon here. And transform you, and your micro, into something special.



Sunshine books Direct Order Form

Books for the BBC Micro

Functional Forth	£5.95
Graphic Art	£5.95
Programming for Education	£5.95
DIY Robotics and Sensors	£6.95
Making Music	£5.95

Electron Books

Programming for Education	£5.95
Graphic Art	£5.95
The Working Electron	£5.95

BBC Micro & Electron books

Artificial Intelligence	£6.95
Essential Maths	£5.95

Send to: Sunshine Books, 12/13 Little Newport Street, London WC2R 3LD

Please send me the following books:

Book _____

Book _____

Book _____

☐ I enclose a cheque for £ _____ payable to Sunshine Books.

☐ I enclose a postal order for £ _____ payable to Sunshine Books.

☐ Please charge my Visa/Access card No. _____

Valid from _____ expires end _____

Signed _____

Name _____

Address _____

Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-437 4343



Hi-res pictures

Simon Johnson of Sheffield writes:

Q I always wondered how commercial programs displayed high resolution pictures. I thought the most obvious way would be to copy the whole display file into Ram. I tried it twice, once into a low address in Ram, and then into a high one. I assume it has to take up 6,000 bytes (6,143 in fact). How then do commercial programs? Can you tell me how you store pictures and then call them onto the screen?

A Pictures on the Spectrum, which is the machine I guess you have, are displayed to the tv screen from two areas of Ram. The Display File (address 16384 to address 22527) holds the data to be displayed on the screen, and the Attributes File (address 22528 to address 23295) holds the colour and display characteristics of each position on the screen.

As you can see the memory required to hold a complete picture is 6,912 bytes (6,144 for the display file, and 768 for the attributes). Now, as 6 pictures would require 41,532 bytes that only leaves 7,620 bytes for the actual program. Not a lot you may think, but an awful lot for a machine-code masterpiece.

The normal technique adopted is to store the pictures at the top end of Ram and then to use a screen switching routine (in machine-code) to put up the new screen. It is also normal practice to store the first screen in the display file and not to carry that overhead in the program.

To store a picture in a program you need to put the contents of the display and attribute files into a high memory address and then save them to cassette as you would a piece of machine code program.

Many commercial programs use complex data compression tricks to get in more pictures. For example, often any particular picture is made up of a number of elements some of which are used as part of other pictures. In this way the screens are built up as a jigsaw of the same parts arranged in different ways.

Broken Genie

C Marriot of Berkhamsted, Herts, writes:

Q I have a non-working Colour Genie (due to a keyboard defect) and I wish to know if it is possible to use the Z80 processor and 16K Ram chips inside to convert my BBC B to a 2 processor, 48K machine, and how I go about it? Also, if I do this, what additional software will I be able to run on it?

A The main reason for adding a Z80 chip to a BBC is to run software under the CP/M operating system. This allows you access to a large number of software packages of which perhaps the most famous are the STAR series (Wordstar, Calcstar and Dastar).

Whilst it is possible for you to build your own up-grade kit, it would be a prohibitively daunting task. It's not just simply a matter of connecting up a few chips; I'm afraid you would need to be a good electronic engineer.

As I don't really have any good news for you on that front perhaps you would be interested to know of a firm near you who might be able to cure your sick Genie? Computer Field Maintenance, of Excell House, Trust Industrial Estate, Wilbury, Hitchin, Herts, say that they will undertake repairs on any make of popular home micro. Why not give them a ring, and give your Genie a new lease of life?

Basic variables

Jonathan Frank of Edgbaston, Birmingham writes

Q I was wondering if you could tell me how to set up Basic variables from machine-code on the Spectrum. How is the variables area organised? The problem arises from Myrmidon's Micro-print 85 machine-code utility, in which some variables have to be set up for printing in the right place. I am writing an Interface 1 routine which will let you just type `Print X,Y,CPL,ATTR`, for position, character size, and colour, and the routine will do the rest. Can you help?

A Chapter 24 of the Spectrum manual, pages 166-167 illustrates how variables are held in the Spectrum. If you want more information then why not try Peeking the contents of the variables area for a program that you have written, ie, where you know what the size and names of all the variables are.

Graphics and sound

Michael Crawshaw of Hinchley, Leics, writes:

Q Having read *Commodore 64 Computing* by Ian Sinclair (which was nothing short of excellent) to plough my way through Basic, I have decided to go onto graphics and sound.

To help me I bought *Graphic Art* by Boris Allan which seems too complicated for a beginner like myself. I would be grateful if you could give me more information on 'simple' graphics books.

Also, would machine code be easier to operate the Commodore graphics?

A Your second question actually helps me to

answer your first. I would suggest that you have a look at machine-code programming. The full graphics capability of the CBM 64 is far better exploited in machine code than in Basic. There is a book *Using the 64* by P Gerrard, which covers the use of machine code, particularly in the area of graphics and sound. Although, I could not describe it as a 'simple' guide to graphics I think it is well worth the effort of grafting away at the examples it gives. The book is published by Duckworth and costs £9.95.

Dots per second

Oliver Snow of Shrewsbury, Shropshire writes:

Q I have several questions to which I have been unable to find the answers.

1) What is the meaning of the term Baud rate?

2) Is there any way I could alter the Baud rate for saving and loading from tape on my Spectrum?

3) Where in the Rom are the Save and Load routines located?

A The original meaning of Baud referred to early telegraphic signalling, and meant 'one dot per second'. In computer language this translates to one bit per second. Therefore, when reference is made to 300 Baud, this is merely another way of saying that 300 bits per second, or 37.5 bytes per second, are being transmitted.

The Rom routines for cassette handling start at address 4C2h and finish at 9F3h. In order to use them yourself you will need to refer to them in some detail. *The Complete Spectrum Rom Disassembly* by Logan and O'Hara published by Melbourne House is ideal and contains all the information you will need.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD

CLASSIFIED

Semi-display — £6 per single cc
Lineage — 25p per word

CALL DIANE DAVIS ON 01-437 4343 FOR SEMI/DISPLAY ADVERTISING

GAMES SOFTWARE

X-CERT SOFTWARE

The sauciest game ever released for the 48K Spectrum, is available now, but only by mail order. Written entirely in machine code the game consists of 4 waves of SHOCK, HORROR and SCANDAL, featuring the ugliest to the most beautiful of girls, in which you have to..... CENSORED...also you must..... CENSORED...all the time. For your copy "Gissa Kiss" (code name, Smtut) discreetly packaged, send £5.00 to Titan Programs Ltd., 46 Market Place, Chippenham, Wilts. SN15 3HU.

OVER 18's ONLY

THE CHEAPEST AROUND

SPECTRUM	COMMODORE
Snooker £7.00	Hunchback £5.50
U-Upstart £4.10	Mr Wimpy £5.10
Hunchback £4.10	Forbidden
Whooie £4.10	Forest £6.10
Trashman £4.30	Dungeons £5.10
Blue Thunder £4.10	Twin King-dom Valley £6.10
F-Manager £4.50	
B-Bover £5.95	
Mr Wimpy £4.75	

Oltrossoft, 19 Heath Lawns, Catfield, Farnham, Hants. PO15 5QB.

DRAGON 32 OWNERS. Cecil plays 21 (not just another card game) the card mad gambling dragon, he loves winning but hates losing and will tell you so. (Hires, personality program). Also: roulette and craps. Two superb hires games on one cassette, no luck at the table then try the wheel, each cassette only £4.95 or buy two for £8.00 cheques p.o.'s to Snip Software Ltd, P.O. Box 20, Woking, Surrey GU21 3QN.

JET-SET WILLI. Infinite live plus Mansion Plan plus start any room, £1 + stamp. Kerr, 24/25 High St., Kings Lynn PE30 1BP.

PRICE BREAKTHROUGH

ON SPECTRUM GAMES ONLY £3.99 + 40p P&P.
TRY THE ADDICTIVE "ROCKSTAR" OR "LUCKY DRAW POOLS PREDICTION" BY CRYSTAL BALL.
Full list with order.
LLAINLAN SOFTWARE
Pontyberem, Llanelli, Wales. SA15 5HP

SPECTRUM 16/48K, "Raquel" presents her games pack for ages 16 and over only (state age when ordering). Still only £3.50. I. Brooks, 17 Malvern, Coleman Street, Southend, Essex.

SUMMER CLEARANCE SALE

FOR SPECTRUM 48K	R.R.P.	Our Price
World Class Darts	£6.95	£4.95
Mix 'N Match and Mistermind	£6.95	£4.95
Stock Control Database	£10.95	£7.95
Last few now. £9.95 for all three		
Send cheques/POs (p&p inc.) to:		
ALPHASOFT,		
7 Moss Carr Avenue,		
Keighley, W. Yorks. BD21 4SE.		
(same day despatch)		

HELP? Have you written any good arcade adventure of strategy games? Your program could be better than you realise. We will give you free appraisal and help with marketing. Don't hesitate! Send tapes with instructions for quick reply to: 4TH DIMENSION, UNIT 4, 4TH AVENUE, BLUEBRIDGE, HALSTEAD, ESSEX.

SABRE WOLF map showing full details, only 80p. Send cheque/PO to S. Stanley, 155 Walkey Lane, Heckmondwike, West Yorkshire WF16 0PD.

SPIDERMAN and Fruit Machine. Arcade style games for the BBC 'B'. Only £3.50 for both. Cheque/P.O. to A. Laird, 29 Laburnum Close, Bradwell, Gt. Yarmouth, Norfolk, NR31 8JB.

CBM 64 + ZX81. Fancy some fun in the dark with your friends? (aged 16+ only). New "Strobe" only £1.99. S. Weir, 42 Elieave Livingston EH54 8ET

50 GAMES AT £8.50!

STATE MACHINE

35% to 55% discount off all computer games for CBM64, Spectrum, VIC 20, BBC, etc. High-quality C10 blank cassettes with every order.
Order with every order 10 C10's for £2.99 or a hundred for £29.50 with your games.

Programmers wanted.

Mail Order only

May Computer Services,
24 Edward Road, London E17 6LU

SABREWOLF, full map of screens and hint sheet, send £1 and SAE to Andy Leah, 52 Hawthorne Drive, Stalybridge, Cheshire.

MTX500/512 software. "Mission Omega" and "Arcasions". Machine code arcade style games. £5.50 each. Christopher Sawyer, 3 Deanston View, Doune, Perthshire.

Sabre Wolf	7.99
Trashman	4.50
Psytron	6.10
Jet Set Willy	4.70
Fighter Pilot	6.20
Discount software for most computers	
Write, ring for list now. State comp.	
TECHNIPLAY SOFTWARE	
74 Dornoch Drive, Hull HU8 8JL	
0482-712958	

BODY — POPPING, break dancing. All styles of disco. Teach yourself. SAE for details. Dance Publications, 136 Monk-hill Lane, Pontefract WF8 1RT.

CGL/SORD M5 "FLIGHT SIMULATOR" for Basic-G

Very the like the real thing

Send £6 inc p&p to:

P. Gabbas,

47 Station Rd,

Hailsham,

E. Sussex. BU27 2LJ.

(Basic G cartridge at £32 extra)

UTILITIES

THE DUKE: cassette-microdrive utility program. Re-writing unnecessary with ultimate, imagine games, etc, even

transfers Scrabble £5.95. M. Alexander, 24, Whitecross Rd., Hereford.

ARROW MICRO SERVICES — Commodore 64 —

ARROW TURBO-SAVER

Fed up with waiting for those programmes to load? Well you need Turbo-Saver, easy to use and faster than 1541 disk drive, save a fortune on tapes. £7.00

ARROW TRANSFER

Transfer your favourite games and programmes to disk, multi port and Auto runs, full instructions included £7.00

ARROW MICRO SERVICES

20 Portmeadow Walk
London SE2

MICRODRIVE ONE (MD1)

WE OFFER ON ALL OUR PRODUCTS A FULL MONEY BACK GUARANTEE an update service, and FULLY detailed instructions with USER friendly programs. Match that!

YES AT LAST 48K Spectrum owners with m/drive can NOW transfer the MAJORITY of their cassette programs to m/drive (inc headerless, long programs, + those with LOW addresses — say 16384) and get them running.

OUR TC5 program transfers the bytes + basic + arrays to m/drive at £5.50, but MD1 has 5 programs HELP YOU get them running + 2 "CAT" housekeeping programs. Includes program analysis, and other programs that produce the m/code you need. All our programs reviewed have received max 5 stars! (incl GRAPHICS toolkit £5.50). Introductory price £6.50 inc p.p. OVERSEAS customers: add £1 Europe, £2 others for each product. Send SAE for enquiries.

LERM, Dept WE1, 10 Brunswick Gdns, Corby, Northants.

SPECTRUM 48K Microdrive utility, displays all file names, sector and file headers, sector distribution map, file integrity check. Menu driven, m/code £4.50. From Easyuse Software, 67 Arlott Crescent, Oldbrook, Milton Keynes, Bucks MK6 2RA.

CLASSIFIED ADVERTISING RATES:

Line by line: 25p per word,
minimum 20 words.

Semi-display: £6 per single column centimetre, minimum length 2 cm. (Please supply A/W as PMT. Or supply rough setting instructions.)

Conditions: All copy for Classified section must be pre-paid. Copy date 7 days before publication.

If you wish to discuss your ad, PLEASE RING Diane Davis 01-437 4343.

Here's my classified ad.
(Please write your copy in capital letters on the lines below.)

Please continue on a separate sheet of paper

I make this words, at per word so I owe you £

Name

Address

Telephone

Please cut out and send this form to: Classified Department, Popular Computing Weekly,
12-13 Little Newport Street, London WC2R 3LD.

foundation
applied computing
ST110 STATISTICS
& **REGRESSION ANALYSIS**
Basic statistics + linear, log,
power, exponential regressions
Up to 10 variables.
over 16K for data storage.
The program is written in m/c.
Microdrive compatible.
£8.00 + 75p p&p
ST130M As ST110 but allowing up
to 30 variables to be used.
On m-drive.
£15.00 + 75p p&p
All programs for 48K spectrum.
FOUNDATION APPLIED COMPUTING (cpw)
Albreds House, Lydgate Lane,
Sheffield, S10 5FH.

SOFTSAVE disc for the Vic20 to transfer
your cassette software onto floppy
disc. Cassette with instructions £5.95
from: Softsave, 65 Stonewood, Bean,
Dartford.

Friendly Face

Microdrive Utility

BEYOND TAPE CONVERSION: These
routines make your life easier, by using
menus in place of commands.
Professionally written MERGE routines
for any version of Tasword Two and
Masterfile, giving complete flexibility.
Cartridge based routine aids loading and
file management.
Available NOW from MONITOR.
P.O. Box 442, Mill Hill London NW7 2JF.
Cassette £7.95 Cartridge £14.95 incl
VAT.
Write or call 01-959-1787 for leaflet.

THEE JETSET WILLY EDITOR
100% machine code program. Will
totally redesign Jetset Willy and
create an extra 3 rooms.
£3.50 (inc. p&p).

Send cheques/POs to:
SOFTTRICKS
1, Rowan Place,
Dundee,
Scotland DD30 PH.

Q.L. UTILITIES
4 programs on microdrive for
Sinclair Q.L. to prevent
D.I.Rection overwriting the screen,
provide single key L.O.A.Ding
or D.E.L.E.Tion of files, repeat
F.O.R.M.A.T.ing of cartridges and
back-up C.O.P.Y.ing of whole or
part of a cartridge. £10 from:

W.D. SOFTWARE
Hilltop,
St. Mary,
Jersey,
Channel Islands
Tel: (0534) 81392.

ACCESSORIES

ZX MICRODRIVE
£46.95 each, or 2 for **£90**
ZX INTERFACE 1
£44.95
ZX M.D. Cartridges 2 for £9.50

Delivery normally by return of post.
Credit Card orders, Tel: 0223 312453
Cheques/PO or cash (Registered) to:

SOFT SPOT

10, Chapel Lane, WICKEN, Nr. Ely,
Cambs. CB7 5XZ

QL Centronics printer
interface.
£49 inc.
Mail Order Only

MISTRY MICRO SERVICES
75 St. Margaret's Road,
Bradford BD7 2BY

QL CONNECTORS
Joystick adaptor; for use with
any standard joystick; **£6.00**
SER plug with 1 m cable; **£3.00**
CTRL plug with 1 m cable; **£3.00**
Prices include VAT, UK P&P
TIMEDATA Ltd.
16 Hemmells, Laindon, Essex
SS15 6ED. Tel: (0268) 418121

C20 BLANK CASSETTES AGFA TAPE

10 FOR **£4.60**
20 FOR **£8.20**
50 FOR **£18.00**
100 FOR **£34.00**

Prices inc VAT & UK delivery.
Order despatched within 48 hours.
Send cheque/PO to:
K. WILLIAMS
48 Widden Street, Gloucester
GL1 4AN

BBC OWNERS SPECIAL OFFER!

Centronic printer cables. 4 feet.
Only £9 inc. VAT, postage & packing
FULLY TESTED AND GUARANTEED
Send cheque/PO to:
Data Disk
63a King Street,
Knutsford,
Cheshire, WA16 6DX
Tel: 0565 53605
Trade enquiries welcome

BLANK CASSETTES
10 C10's for £3.65; 100 for £23.00
inc; library case
"RAM" TURBO INTERFACE'S £21.00
Fully Guaranteed (inc. P&P)
UK HOME COMPUTERS
82, Churchward Ave, Swindon, Wilts.
(885034)

SERVICES

HEMEL COMPUTER CENTRE LTD.

For fast reliable repair service,
send your 16/48K Spectrum
computer to us.
We will repair and return for
£16 + p&p.
Also Atari and Dragon service
Hemel Computer Centre Ltd.
52, High St,
Hemel Hempstead,
Herts.
HP1 3AF
Tel: 0442 212436

SPECTRUMS SERVICE AND REPAIRS

MAIL ORDER OR CALL IN
HUGE

selection of software and full
range of accessories. SAE for lists.
Enfield Communications,
135, High Street,
Ponders End, Enfield, Middx.
TEL: 01-805 7434.

THIS SPACE FOR SALE

£18

TELEPHONE:

PCW CLASSIFIED
01-437 4343 Ext 206

REPAIRS — ZX81 — SPECTRUM
out-of-guarantee repairs by our
computer dept. Engineers have had
three years experience servicing Sin-

clair computer products. Price including p+p ZX81 — £11.50; 16K Ram —
£9.95; Spectrum — £18.75. Send with
cheque of P.O. to: TV service of Cam-
bridge Ltd., French's Road, Cambridge
CB4 3NP. Tel: (02223) 311371.

ZX81 & SPECTRUM REPAIRS
ADD ON SPECIALIST
MOST COMPUTER COMPONENTS
SPECTRUM REPAIRS AVERAGE £15
● 24 hour turnaround or While-You-Wait
● Keyboard with spacebar — £46.00
● Open 9 am to 5 pm Mon-Sat
SEND FOR FREE ESTIMATE
(ENC. £1.60 P&P)
MANCOMP LTD.
Printworks Lane, Levenshulme
Manchester M19 3JP
Tel: 061-224 1888

SOFTWARE

COMPUTER SOFTWARE: BUSINESS AND GAMES FOR MOST COMPUTERS.

Commodore 64, VIC 20, BBC,
Atari, Dragon, Spectrum,
MZ700, ZX81.
New Releases for CBM 64,
Spectrum, BBC, Atari, Dragon,
Spectrum, MZ700, ZX81.
New releases for CBM 64,
Spectrum, BBC. Every 2
weeks — just send S.A.E. and
we send you a new list every 2
weeks.
Altai C10 data cassettes 40p
each. 5 C15 data cassettes £2.40
5 1/4" floppy discs D/sided —
DL density. £2.30 each or 5 for
£10.

Send to: M.J. Seaward, St.
Olaf's Road, Stratton Nr.
Bude, Cornwall EX23 9AF
Tel: (0288) 4179

up to 50% off!

write to:

CLUBSOFT
Unit 18, Wye Industrial Estate
London Rd. High Wycombe

JULY SALE

SPECTRUM **CBM 64**
Blade Alley 4.55 Ocean titles 5.10
Scuba Dive 4.55 Interceptor IIs 5.35
Soft Proj IIs 4.85 Softtek titles 6.15
Mugsy 5.15 FlightPath 7.37 6.15
Lords of Mid 7.45 Space Pilot 6.15
MAIL ORDER SOFTWARE, 9 KNOWLE
LANE, BRADFORD, BD12 9BE.

SPECTRUM and Dragon software to
swap. Tel: (0473) (822284 after 7pm).
AMWAY distributors ordering program.
Consolidates orders and adds totals.
Spectrum 48K. Tape £3.00. Carfers, 24
Pier St., Lee on Solent, Hants.

GAMES SALE

while stocks last.

CBM 64 **BBC 32K**
Forbidden Forest 7.00 Flight Simulator 7.50
Stryx 7.00 Golf 6.50
Grand Master 14.00 Snooker 6.50
Hunchback 5.50 Twin kingd. valley 7.00
Snooker 6.50 White Knight Mk 2 9.00
Send cheque/PO (money returned if sold out) to:
STEYNING VIDEO, 7 Saxon Road, Steyning,
Sussex BN4 3FP
FIRST COME - FIRST SERVED BASIS.

SAVERS

COMPUTER COMMUNICATION (UK) Ltd.
PCW, 9 Martins CL. Blackwater,
Camberley, Surrey GU17 0AH

Spectrum.
MOON ALERT £4.99
SABRE WOLF £8.45
CHECKERED FLAG 6.65
CBM 64
BEACHHEAD £7.99
VOODOO CASTLE £7.99
SAE for lists Software, Books
Peripherals for all Micros
Hotline for all micro software
0276 33852

BOOKS

COMPUTER BOOK Specialists. Dra-
gon, Spectrum, Electron. SAE for full



**Book
your
Classified
or
Semi-display
advert by
Credit
Card**

**Call
Diane
Davis
on
01-437 4343**

BARCLAYCARD

VISA

lists. D. A. Armstrong, 30 Octavia St, Kirkcaldy, Fife KY2 5HH.

AUDIO LEARNING Lab's "All About Micro's" Part One. Free details from Savoy Hill Promotions, Cobden House, 76 Newland Road, Worthing, Sussex BN11 1LB.

PERIPHERALS

PERIPHERAL SALE Quickshot 2 £8.99, C-15 pack of five blank cassettes £1.99, D.K. Tronic keyboard for Spectrum £39.99, Quickshot 1 £7.99, Joystick Interface (BBC) £9.50, Joystick Interface (Spectrum) £18.99. Mail your orders to: Paul's Cash & Carry, 88 High Street, Southall, Middlesex, UB1-3DB.

COURSES

HOLIDAY COURSES FOR CHILDREN NOW BOOKING

(£45 for 5 mornings)
(Adult courses as usual)

Booking now: Commodore, Vic 20, week beg. Aug. 6th

Ring: Computer Workshop on 01-778 9080
32 Sidenham Rd., Sydenham London SE26

EDUCATIONAL SOFTWARE

MATHS PROGRAM (11-14). 48K Spectrum written by graduate maths teacher. Includes basic arithmetic and trigonometry and more. Only £4.25 to: D. Thomas, Corner Cottage, 19, Castle St., Ludgershall, Nr. Andover, Hamps.

MAGAZINES



DRAGON USER

To make the most of your Dragon you need **Dragon User** — the independent magazine for Dragon owners. To make sure that you receive a copy of Dragon User regularly subscribe direct to us. A year's subscription costs £10 for 12 issues (overseas rates available on application). Send a cheque or postal order made payable to Dragon user, and accompanied by your name and address, to Dragon User, Subscription Department, Oakfield House, Perrymount Road, Haywards Heath, Sussex RH16 3DH.

DUPLICATION

Dear Reader, my name is Simon Stable, I specialise in real-time data duplication for most cassette based micros. Disc copying for BBC 40/80 (protection available) Dot-matrix printed labels/ blanks. Blank cassettes. **FAST TURNAROUND 0869 252831 COMPETITIVE PRICES**
P.M., FREEPOST, 40 WESTERN, LAMINGTON, OXON OX5 0JZ

DATA DUPLICATION M.G. COPIES

Burnthwood, Walsall, West Midlands. 0543-480887 or 05435-75375 (24hrs)
Data duplication, quality cassettes, printing, distribution to customers with competitive prices and fast turn around. Price lists and samples on request.

AUCTIONS

MICRO COMPUTER AUCTIONS

REGULAR MONTHLY AUCTIONS FOR ALL MICRO HARD AND SOFTWARE. SEND NOW FOR ENTRY FORM OR NEXT CATALOGUE.

TO:

Micro Computer Auctions (PCWK)
Northington House
59 Grays Inn Road
London WC1X 8TL
Tel: 01-242 0012 (24 Hours)

RECRUITMENT

GENERAL SECRETARY — GOSH

The Guild of Software Houses are urgently looking for a full time General Secretary to administer the affairs of the Guild. A good working knowledge of the Home Computer Software Industry, the ability to deal with the press at first hand and do your own typing are all vital.

Salary £8,000+ per annum. West end office location.

Applicants should write immediately to

Mike Johnston,
GOSH
71 Park Lane
London N17

FOR HIRE

TO HIRE a computer from Spectrum 48K upwards, please phone or write to Business & Computer Services, 294a Caledonian Road, London N1 1BA. Tel: 01-607 0157.

HARDWARE

A SNIP at £850. ITT 2020 (Apple IIE) 32K complete with twin disc drives, word processor, software and Visi-Calc. High resolution green screen monitor. All cables and serial printer driver P.C.B. Phone evenings after eight pm — 01-397 1230.

FOR SALE

SPECTRUM 48 + keyboard + interface + m/drive + recorder. Many tapes, manuals. Perfect working order. £230 phone 01 653 0216 after 6pm.

VIC 20 + C2N many mags eight cartridges intro to Basic 1 loads of s/w year old fully boxed worth £500 asking. £350 ono. Tel: Ammanford 3825 after 6pm.

SINCLAIR QL for sale. Includes RS 232 lead, four extra MDV cartridges, and Spectrum NET program. Offers £400 plus. 0273 681542.

VIC 20 32K switchable joystick, 3 cartridges, 25 cassettes worth £360. Sell for £180. Tel: 01-445 1385.

FOR SALE teletype in good working order, centronics adaptor available, £50 ono. Phone David Crawley (0293) 24524 evenings only.

ZENITH WH-14 dot matrix printer serial 110-9600 baud one year old with manual, RS232 cable £175.00. Perfect condition. Tel: Northwood (09274) 29075.

SHUGART MODEL 450 dual disk drives not interfaced to any computer £225. Single Siemens disk drive for Apple computer £125, Leics 673536.

ZX81 16K Filesixty keyboard recorder leads manual and various software first. Offer £55 secures. Phone Stafford 48338 after 7pm (0785)

AMSTRAD COMPUTERS Green £217.50 — colour £299.50, Brother HRS printers £147.50. Computec, 135-137 Glasgow Road, Glasgow G69-6TA. Telephone 041 771 0074. P&P free.

VIC 20 + 16K, C2N cassette recorder, intro to basic 1, software, magazines, joysticks + Atari 2600 with 4 cassettes £150. Tel: 01 505 4848.

VIC 20 extended basic (8K/16K/32K). Adds 25 commands utilising sound, colour and graphics (160 x 192). Demonstration programs. £5.50. D. Redmond, 12 Durham Street, Garston, Liverpool.

WANTED

WANTED CBM 64 s/w to swap. Disk or cassette. Telephone 05212 3510 or write to 15 Coles Avenue, Alford, Lincolnshire LN13 0AH. John.

WANTED YOUR SOFTWARE

WIGHTSOFT will pay top royalties for good software for VIC 20, CBM 64 and SPECTRUM

We want original games; arcade and adventure, utilities and educational programs

Send your programs, or for more information, contact:

WIGHTSOFT
OLD MILL FARM
BLACKWATER
NEWPORT
Isle of Wight
Tel: 0983 528763

VISIONARY VOLTAGE

Requires M/C arcade and adventure game program for: Commodore 64, VIC 20, Spectrum and BBC Electron. Also programmers capable of translating between the above (based in London Area/Midlands.) Please send cassettes with loading instructions, and details to:

Visionary Voltage
34, Bendemeer Rd,
Putney
London SW15

AGENTS WANTED

To supply hardware/software to clubs, homes, schools, etc. up to 25% commission. £20.00 worth of free software with your first accepted order.

Send for details to Home Base Micro Supplies: 4 Queenswood Avenue, Northampton.

WANTED IMMEDIATELY!

Have you written a computer game?

Are you disappointed with the lack of response from major distributors and publishers?

We will make it work for you! For immediate attention, send tape and instructions to:

The Software Manager,
Computer Classics,
17, Burgess Grove, Greenwich,
London SE10

URGENTLY WANTED ORIGINAL SOFTWARE — for BBC-B, Commodore 64, Spectrum 48K, Vic 20

Contact Lawrence Gilloway on 01-698 1212 for immediate offers.

Longmail Limited,
149, Ardgowan Road,
London SE6

POOTER GAMES is looking for original ZX81 games. Copyright retained by author — royalty paid for ZX81 licence. Write to: Garry Rowland, 24 Parsloes Avenue, Dagenham RM9 5NX.

SUNSHINE

is seeking authors for new titles to add to its highly original and successful book range. Experienced and first time authors are invited to submit manuscripts, ideas or fields of interest. Full details of what we can offer from David Lawrence, Book Editor, Sunshine, 12-13 Little Newport Street, London WC2R 3LD.

Sunshine: Publishers of Popular Computing and Dragon User

INTERNATIONAL CO REQUIRE NEW PROGRAMS

We urgently require new original programs, all machine types, for UK and world wide distribution.

TOP ROYALTIES PAID.

Send your programs to:
RAZORSOFT, 12 Rosehill,
Sutton, Surrey

MICROWRITER WANTED also TV interface £200 up, depending on model and location. Tel: Sat/Sun or evenings 01-947 1830.

WANTED ZX81, Spectrum Commodore Dragon etc. In any condition. Non worker or incomplete preferred. Even non U.K. version. 036287 327.

I WILL PAY YOU BIG MONEY:

For original Spectrum games, or programs of any kind. Lump sum or royalties on each game sold. Fast reply, so don't delay, send today, on cassettes, to:

LLAINLAN SOFTWARE,
Pontyberem,
Llanelli, Wales.
Tel: (0269) 871158

Computer Swap 01-437 4343

Free readers entries to buy or sell a computer.
Ring 01-437 4343 and give us the details.

Spectrums for sale

48K Spectrum, still under guarantee inc £100 of original S/W + £48 computer magazines 2 programming books £110. Tel: Slough 24695

Over 200 original Spectrum games to sell or swap. Tel: Stewart on (0506) 56478

ATARI vcs + 7 cartridges, tidy case, storage pack, dust cover, worth £250+ accept £130 ono. Tel: (0633) 893 997

48K Spectrum, boxed, hardly used. Cassette games inc Hobbit, Piernia £110. Tel: 01-521 0672

48K Spectrum with joystick + joystick interface. £50 of S/W ie: manic minor + jet pac £130. Tel: (0222) 867086

48K ZX Spectrum some 2/3 games + books introduction machine programming, sell £70.00 tel: 01-789 7551 872295. Kimber after 4pm.

SPECTRUM S/W for sale, all original adventures, some of the latest games, £3 each. Bristol 649441.

10 ORIGINAL GAMES for 48K Spectrum inc: Forest Rack + Apocalypse. Prices from £3 to £6 or swap for Scrabble + Move. Tel: 0895 39850. Dave.

11 OF THE BEST games £25.00 ie: Manic Miner, Hunchback, Mr Wimpey, Jet Pack, Royal, Birkpaia, Orbiter, Coo-kier. The originals. Tel: 01-952 2870 Daniel.

SPECTRUM originals pimanía £3: bridge player £4: bridge tutor (advanced) £4: 007 spy £3: zap 2 £3: star warrior £3: automonopolis £3: trojan light pen £10: P.R. cooling unit £5: tel 0388 772588

48K Spectrum, 22in Pye colour TV S/W inc Quill, Currah Speech Synth. AGF programmable joystick, interface, quickshot, printer, cassette recorder. Tel: Plymouth 45732 (before 5pm)

48K Spectrum with fun stroke keyboard, joystick, joystick interface speech synthesiser + S/W + manuals etc. £186 ono or swap. Tel: 01-397 9692

48K Spectrum DK Tronics keyboard, Ferguson cassette recorder. Cambridge programmable, joystick 3 books, loads of S/W. Worth over £350. Sell for £220. Tel: 07048 71751

SPECTRUM PROTEK interface £8.00 Kempston interface £9.00 Spectravideo joystick with twin fire buttons £5.00 also ZX printer + paper £25.00. Wanted Alphacom 32 printer with or without paper, pay £30-£40 Tel: Ferndale 731424 anytime.

SPECTRUM 48K, Kempston interface with Kempston joystick. 110 original games. 7 months old. £200. Tel: Romford 62859 after 4.30pm.

48K SPECTRUM with colour synthesiser 6 mths old. 150 games also £200 or swap for C3M 64. Tel: Romford 40427.

48K SPECTRUM + Alpha Com Printer + W.H. Smith CPO 8300 tape recorder + 34 original tapes inc: Zeus, Valhalla, JetSet, Alic Atac, Codename Matt, Trashman. Cost £460. Sell £250 ono. Tel: 0704 665675.

48K SPECTRUM 1yr old — good condition + new ZX printer + £50 of s/w (original) £20 worth of bks. £250. Sell for £170 ono. Tel: Tiverton 255145.

SPECTRUM SOFTWARE, guaranteed mint: Ant Attack, H.O.T.T., Wheelie, Trashman, ESP, Island, Velnor's Lair, £4 each. Colossal Advent. £7 Hobbit (inc. book) £9 — Lymington 73788.

FOR SALE 48K Spectrum as new 7 months guarantee. Plus assorted games £100 ono. Ring Colin 515 4696

SPECTRUM SOFTWARE Aspect, 3D Seidab Attack, Luna Crabs, Chess Tutor, Horizons, Galaxians, Leapfrog, Vu Calc, All Horaces, Road Racer, Jumping Jack, Sentinel, Wild Words, Bullo £1.00. Andrew 3, High St, Prybrook, Glos.

SPECTRUM 48K inc joystick and interface cassette recorder, mags, all boxed as new, only 1 month old. Tel: 21248 £120. Phone between 6-7pm.

KEMPSTON INTERFACE and joystick in new condition including free converter tape (worth £4), sell for £18 ono. Also loads of Spectrum programs to swap or sell. Phone 08823 254 weekends.

48K Spectrum. Very little used. £80. Tel: Chandlesford (04215) 3741

SPECTRUM software: games designer, Alic Atac, Dictator, Mr Wimpy, Football Manager, Mad Martha 2, £37 phone 63921 (0743) after 4pm

48K Spectrum, boxed with leads and manuals, kempston interface, originals including manic minor, time gate. £130 ono contact Gareth Bradford (0274) 679492

48K SPECTRUM with DK Tronics keyboard. Ribbon connector, currah speed, Alpha copy printer, Kempston joystick, cassette recorder, lots of mags & s/w. Quick sale £275. Tel: 01-868 2878 (after 4pm).

SPECTRUM 48K, tape recorder & over £150 worth of software. Many books and mags. only £200. Tel: Sunderland (0783) 482447 (after 6pm).

SPECTRUM 48K Quickshot, interface, microdrive, order form and loads of tapes including: Valhalla, Hobbit, Manic Miner, etc. £150 or swap for Commodore. 01-669-0622 (after 5pm).

DK TRONICS keyboard Mark II. Microdrive compatible. £30. Tel: Bristol (0272) 22850.

SPECTRUM 16K, 30K expansion rom, tape recorder, books. £100 of s/w very good condition, worth £280, yours £140 o.n.o. Tel: Aston Abbot 8130 (after 6pm).

SPECTRUM 48K, Fuller FDS keyboard & printer and scrolls of paper & tape recorder. Lots of s/w, £210 o.n.o. Tel: Wrexham 751 549 (after 5pm).

SPECTRUM s/w for sale. Titles i.e. Hunchback, 3D Space Wars, Spectrum Invaders, G-Force, Metroids, Sectors, Ground Attack. £21 the lot or £3.50 each. Tel: (092 572) 4504 (eves.)

48K Spectrum brand new, printer & joystick. £300 of original s/w inc. Valhalla, A/Attack, Jet Set Willy worth £450. Sell £250 o.n.o. Tel: 01-660 3449.

SPECTRUM 16/48K cassettes, over 50 titles at less than half price (originals) printer, speech box, and sound amp. Half price. Tel: 574 4122.

48K SPECTRUM + 300 of s/w. All

originals, 9 months guarantee. Sell £220. 01-311 6829.

SPECTRUM S/W (all original) half price inc. Code Name Matt, Mugsy, Hunch Back, Blue Thunder, Krakatoa, Trashman, Lunar Jetman, Kong, Snore Wolf. Tel: 0734 667608 after 6pm.

48K Spectrum £80 of s/w. Kempston interface £100. Tel: 01 476 8884 after 6pm.

SPECTRUM 48K boxed, manual + leads Kempston + Protex interface + Quickshot joystick £40 of s/w originals. 100's of mags + books £250 ono. Tel: 061 747 4149.

SPECTRUM 48K boxed excellent condition lots of software ie Jet Set Willy, Jet Pack. Tel: 01 868 1086.

48K SPECTRUM ZX, £300 of s/w, still 9 months guarantee. Will sell for £220. Tel: 01-311 6829.

32K RAM PACK for 48K Spectrum £20. Tel: Aston Abbot 8130.

48K SPECTRUM s/w £100 worth. Inc. Jet Set Willy, The Quill, Hungry Horace + Chuckie Egg, + many more. £40 (private sale). Aston Abbot 8130.

SPECTRUM 48K, still under guarantee inc. Valhalla, Hobbit, Wheelie, Jet Man, Football manager, + books £125. Tel: 01 952 2870. David.

48K SPECTRUM, 11 months old, s/w, Hobbit + Flight Simulator, + books + manuals. £95.00. Tel: 01 794 5372.

ZX SPECTRUM s/w (all originals). 50

Commodores for sale

VIC 20 8K Ram C2N cassette recorder, joystick, dustcover + s/w and mags. Boxed £150 ono. Tel: New Milton 0425 61 8200.

CBM 64 + cassette unit, packing and manuals, all new and under guarantee. £160 ono. Windsor 64931 eves.

IBM 1515 PRINTER, £110. Vic file, Vic writer, Vic calc. Disk based £30. Southampton 432610.

VIC 20, C2N cassette recorder. Intro to Basic Part I. 5 cartridges 4 tapes, fully boxed. £100 ono. Tel: Reading 868564.

VIC 20, C2N cassette unit, super Expander, stack 4 slot mother board, point master joystick, Vic Revealed, Learn Computer programming on the CBM Vic. Games., £130 ono. Tel: Chester (0244) 332388.

CBM 64 game file. 70 reviews, room for 185 more. Program utilises search, view, correct and create. £5.00. Tel: 01-549 0075.

VIC 20 GAMES for sale. All originals, £250. Tel: 061 5858. 4.30pm.

VIC 20 1 year old, 16K Ram Pack, £85 of games, £25 of magazines + book. C2N cassette unit. Sale £200. Or swap CBM 64. Tel: 987 5461. Mrs Baxter.

VIC 20 + starter pack: Introduction to Basic I & II, Chemistry, Biology, Physics, Mathematics. 12 original games. 8K Ram. £200. Tel: 254 2685.

VIC 20 16K starter pack + cassette + games, 3 month old. £135. 061 225 9550. Paul.

CBM 64 + C2N + 2 joysticks + 13 games (originals). Popular titles + books + mags. Cost £410. Accept £275 ono. Tel: 624 0242/01 328 0961.

VIC 20 for sale. £160. Price inc: cassette unit + £100 of s/w + Joystick. Tel: 01 992 0536.

VIC 20 16K cassette recorder, extra memory joystick, book, cassettes, motherboard. Worth £300+. Want £175. 1st offer secures. Tel: 0342 27520. Eves.

COMMODORE 64. Quickshot joystick £7, software, Manic Miner £5, Revenge of the Mutant Camels £5, Skramble £5, Radar Rat Race Cartridge £5, Hektic and Jungle Story £1.50 each. Ring 01 204 2456.

VIC 20 CASSETTE, games, mags,

brand new. Either swap or sell for 48K Spectrum. Contact J. Bishop, 29 Shir-dale Close, Maesyowmmer, Mid Glam, South Wales. CF87QL £130.

CBM64 5 month old, C2N cassette, Simons Basic, Joystick, Games & books and more. Cost over £400. Accept £275. Tel: North Weald (Essex) 3796. After 7 or weekend.

For sale

ORIC 1 48K computer with software, £65 or swap Texas TI994A. Telephone Parbold (025-76) 3731.

MICRO DEAL software, unexp. VIC-20 Turbo-Grip, £2 or swap for Wacky Waiters, Quadrant or Frogger. Tel: Glossop 2382.

SHARP M2700 & data recorder & dust cover, £70. S/W 6 months old. Excellent condition, worth £370 sell for £250 o.n.o. Tel: Colne 865821 (after 4pm).

FOR SALE. Binatone TV game Mark IV. Tennis, Football, Squash, Squash Practice. 2 paddles, £10 o.n.o. Phone 031 664 8253.

C.B. 40 channel Gemini, worth £122 & power pack, aerial, SWR, 2 aerials. All worth over £170 will swap for 48K Spectrum in good nick with tape recorder leads etc. (Steve) Thanet 41453.

TIMEGATE, Valhalla, Manicminer, Stonkers and many other titles for the Spectrum £28 for the lot, individuals half price. Quickshot joystick with interface, £180 o.n.o. Phone 5pm and ask for James (0908) 565465.

MICRODRIVE plus Interface 1 with 5 cartridges £85; Interface 2 with "Cookie" Rom, £18 (postage extra £2). Tel: Norwich (0603) 401628 (after 5.30pm).

FRENCH 'O' level revision on CBM64, complete 'O' level revision test. Just in time for your 'O' levels only £4. Ring (021) 742 6334 after 5pm. Also CBM64 software to swap.

QUICKSHOT II joystick, brand new, unused duplicated gift. Retail price £13.95 sell for £10.50 Tel: Baschurch 260405

EPSON HX20 forth rom and parallel interface for sale. Wanted 16K add-on memory and other goodies incl 8143 or 8148 interface

PRINTER data dynamics 390RO teletype 110 baud (works via RS232). Uses plain paper roll £50 Tel: 01-959 1844 (eves)

FREE 48K Oric 1 + £40 software + book to first caller to buy my Oric 1 power pack (£110). Wanted PB100 will pay £30. Phone now Stafford (0785) 211445 (lan)

LYNX 48K, boxed, with leads, manual, software etc. As new. Unwanted prize. £150 ono phone 01-570 8335

LYNX 48K, joystick interface, 7 games, under guarantee £120. Tel: Newcastle 0632 661863

SIMONS basic for CBM 64 £30.00 New. Tel: Bracknell 498173

2 X 8" disc drive complete with Power Supply + cables 1.6 megabyte capacity. Never been used £330 ono Tel: Notts 262488

LYNX 48K + instruction manual + 3 games boxed £150 ono Tel: 0825 4707 Mr Hancock

INTELLIVISION 3D games console and computer adaptor with keyboard plus two games. Swap for Spectrum 48K. Phone Roy on Lincoln 730251 after 18.00 hrs Monday to Friday.

ORIC 1 48K plus 14 software tapes including Oricmon, Zenon, Galaxians, etc plus leads and manual. Cost £260. Ask £110 ono. Tel: 01-840 3945.

BBC HOBBIT tape system unit, leads, manual, 3 tapes Rom. Normally £166, sell for £110. Keyboard control rewind etc. 60 files, 60K each side. Tel: 0232 716583 after 6pm.

PRINTER STAR DP510 (Epson compatible) manuals, BBC cable, original packaging — as new. Reason for sale — upgraded to Daisywheel. £170 ono. Cambridge area. Phone 022 026 3107 after 5pm.

SHARP MZ80K 48K; Sharp P3 printer plus interface box, books and software including Word Processor, assembler etc. Offers if interested to Langport 250130. Can deliver if necessary.

PRINZTRONIC HOME ent. centre + 6 cartridges £20.00. Tel: 860 207 (Cirencester).

48K ORIC 1 + £65 s/w & books to Forth & Assembler £70 ono. Tel: 0272 516335 (9am-11am).

LYNX 48K inc. machine code program books, £36 of s/w. Lynx user + Nilog news letters. Dust cover. Boxed. Loads etc. Excellent condition. £170. Tel: 0344 882255. M. Fenton.

STONECHIP ELECTRONICS echo amplifier for Spectrum, volume, tone, control, switch for 'saving', 'loading' no more swapping leads 1/2 new price only £10 or swap orig s/ware Tel: 01-529 0071.

VALHALLA ORIGINAL copy brand new with instruction manual only £6.50. Tel: Stowmarket 615581 (evenings).

ORIC 1 16K + tape recorder + 5 tapes including Ultra, Hopper & Invaders, also 8 books including Oric Handbook, Oric Companion, & 8502 machine code. Offers over £130 considered. Tel: 01-699 5354.

COLECO TURBO expansion module £25. CBM64 owners with disc drive required to swap software and ideas, contact Bob after 6pm on (0946) 831459.

STAEDTLER DRAWING board and compass set. V.G.C. worth £50. Sell or swap for 48K Spectrum software. Offers to Colin. Tel: Kilwinning (0294) 52723 evenings.

ACETRONIC GAMES cartridges shooting gallery, Black Jack, Circus, Soccer, Invaders, air/sea attack, musical games. All excellent cond. £4 each Tel: York 51130 after 6pm.

1515 PRINTER. (84/VIC20) 8 1/2 x 11 inch paper. I box paper, spare ribbon, lead, manual. £180. o.n.o. Tel: 01-840 3610 buyer collects.

SHARP MZ-80K and book and s/w incl. Space Invader, Galaxian and Chess. £220. Tel: 0229 37853.

ORIC I FOR SALE 48K and necessary equipment. No extras. £130 ono. Brand new! Tel: 01-690 6760 office hours (Ronnie).

CURRAH SPEECH UNIT, one month old. Excellent condition with manual and tape. £25 ono. Tel: (0244) 533 438, 4pm-7pm.

SHARP MZ-80K 48K Ram with manual, Basic tape and loads of software includ-

ing Defender, Pacman, Asteroids, Wizards Castle and Haunted House. Any offers considered. Phone Diss (0379) 51216.

CAMBRIDGE COMPUTING Intelligent joystick (complete) £30 or swap for ZX printer also swap s/w, Hobbit, Manic Minor, Trans AM, Android, etc. for rolls. Tel: Joe 01-622 9929.

FULLER BOX, brand new, unwanted gift. £20.00. Tel: 0703 447704.

ORIC 1 16K as new, plus Ultra tape and book, The Oric 1, by Ian Sinclair. Only £80 for quick sale. Contact Paul, 14 Rider Rd, Woodhouse, Leeds.

LIMITLESS LIVES on two top — selling games. Also, how to jump from one level to another in one of them. Easy — Just phone St. Helens 26314 now and find out!

48K LYNX with £165 software, all originals. Plus Joystick and interface, book and newsletter. £190 or swap for CBM 64 and C2N. Tel: 061 339 6779 after 5pm.

ZX INTERFACE 2 Quickshot Deluxe Joystick, will swap for Kempston Joystick interface or sell for £25 ono. Tel: (0482) 881811, North Humberside.

SOCCER, Defender, Pole Position, Blue Max, Hobbit for CBM 64 for sale. Phone 061 881 3651. Ask for Tony.

SHARP MZ80 A boxed as new. Huge quantity of s/w. £350.00. Tel: (0325) 84968.

MICRODRIVE with two cartridges i/face one cables etc. Some software. As new in original box. Offers around £100. Tel: (08833) 4503.

LYNX 48K As new plus 'Lynx computing' book plus software. £130 Belper 4080.

TRICKSTICK Joystick, programmable interface and Attactics program. Unwanted gift. New unused. Sell for £40 ono. Write: Jeff Wass, 9 Irby Road, Scunthorpe, S. Humberside DN17 2ES.

SHARP MZ-80K, 48K, integral monitor, cassette, boxed, excellent condition, 4 Basics, software, 15 spare cassettes, cover, reset switch, manuals, Z80 book. £200 ono. Tel: (0226) 766342 (after 4pm).

SELL COMPETITION pro Joystick and Kempston interface as new. Worth £24.00. Quick sale at £15.00 or offers. Ring after 5.00 (0703) 842461. Ask for Jon.

ADVENTURE LAND and Starbattle cartridges and Wacky Waiters cassette and Humphrey cassette. Requires 8 or 16K expansion 3K expansion cartridge. Worth £80. Selling for £25. All for VIC 20. Largs 675184.

INTELLIVISION for sale with Soccer and Star Strike. Quick sale £45 ono. Tel: Pinner 8666538.

SHARP MZ80K 48K + 2K Quantum Hi-Res graphics. Basic and Forth tapes.

Some games tapes + Sharpsoft mags and books. £275. Tel: (Manchester) 224 9835.

MCP 40 COLOUR PRINTER PLOTTER Centronics interface includes spare pens, paper. As new. £100 including postage or will swap your 48K Spectrum Issue 3. Will pay for interface 1. Dennis 0203 385614 or 0993 830248.

ORIC-1 48K will all leads plus software (including Xenon-1). Perfect condition. £110 ono. Tel: Turvey 777.

TEXAS T199/4A 16K with cassette recorder plus tapes, introduction to Basic programming, interface cable and books. 4 months old. Bargain at only £95. Tel: Holbeach 0406 370190 evenings only.

SEIKOSHA 250X, 9 months old, excellent condition. Free box of paper. £185. Antony, HSE 68, Castle Inwell, Cromwell Road, Salford.

MEMOTECH 512 with data recorder and extra tapes. Worth new £350. Tel: 01-622 2306 with sensible offers.

SALE SELL: Paratroopers, Wacky Waiters, Amok and Wizard and The Princess, £5 each or swap three for an Adventure Cartridge or 1 for Snooker by 'Visions'. Offers taken, all new. Tel: Sean Taylor, Farnham Common 2922.

SHARP MZ 80K, Parnell printer interface Crystal Basic SP-5025 modifications. Zen assembler, disassemble. £195 ono. Also Epsom MX80 available. Probably delin. Tel: 01-642 3318, 0202 473676, 0329 23870 ext. 244.

BRENDEL, new, excellent condition, computer desk. Ready built £15.000. Tel: (0782) 24552.

48K LYNX plus s/w. £100. Tel: 01-691 0118.

SEIKOSHE GP 100CC printer for Vic 20 or Com 64. 3 'O' Level revision for the Vic plus 8K. Ring Paul for details on (0782) 550546.

Wanted

WANTED 'DRAC MAN' and 'Silent Running' from 'Your Computer' magazine. Someone must have got them to work! Please ring 0278 663201 or write 14 Halswell House, Goathurst, Bridgwater, Som.

WANTED, SPECTRUM machine code utilities, assemblers, disassemblers, monitors etc. Send any lists + an SAE to Richard Smith, 14 Henson Road, March, Cambs PE15 8BA.

WANTED SHARP PC 1500 and printer/interface plus RAMpack. Will pay up to £170. Phone Tiverton (0884) 256119.

SWAP VIC-20 + 32K switchable RAM pack + 3 cartridges + over £100 of software + cassette deck + joystick for CBM64 or sell for £220. All in very good cond.

WANTED INFO on Micro Mice. Have you built one? Have you a design? Wanted for a school project, please help. Tel: Gary on Bristol (0272) 48161 or 23789. Many thanks.

ORIC-1 software to swap, titles include: Hunchback, Xenon-1, Chess, Golf, plus many others. Ring M. Hodgson at Halifax (0422) 201747 evenings or weekends.

SWAP SHARP PC1500 8KRAM + plotter, printer, interface + software for Spectrum 48K issue 2/3 plus printer and/or keyboard. Tel: Sheffield 471160 at 7.00pm. Sharp MZ700 plus printer cassette integral £365 ono. Tel: Sheffield 471160.

WANTED WATFORD DFS ROM and manual. Also Computer Concepts Print Master for ROM for BBC. First reasonable price quoted will be accepted. Tel: Neil on (0772) 600175.

SWAP MATTEL Intellivision + 7 carts and 40 chan. CB, SWR meter and two aerials (v.g.c) for your issue 2 or issue 3 48K Spectrum or CBM 64. Tel: 0933 76849 please.

SPECTRUM SOFTWARE to swap. Ten Little Indians (Digital Fantasia) for any Level 9 or other Digital, also Horace G.S., Astro Blaster, Heathrow A.T.C. Embassy assault, swap separate or everything for Quill. Tel: (0908) 643516.

WILL SWAP superior software Lost City and Gideon's Gamble for two more adventures. One must be Legion + any other. Ask for Philip. Leyland 07744 51872.

SWAP M10 PROGRAMS for ZX Spectrum. Send your list for exchange. A Tuscano Francesco, Via Dei Salici 17, 20025 Legnano (MI), Italy.

DRAGON 32 swap any three programs for Merlin Sprite Magic with booklet. Choose from Devil Assault, R.O. Darkness, Crazy Painter, Pedro, Cuthbert in Jungle. Contact Ian, 3 Birchwood Ave, Grove-Hill, M'bro Cleveland TS4 2XB.

WANTED THE QUILL. Offers under £8. Will pay 40% for most other Spectrum software. Tel: Blackpool, (0253) 891223.

EXCHANGE 3D Deathchase, Wheelie, Zoom, Ant Attack for The Quill. Write to Doug Duffin, 1/4/1 Muirhead, University of Stirling, Stirling, Scotland.

WANTED — TI-99/4A Extended Basic or editor/Assembler module. Will pay half-price. Ring (0924) 468535 (after 12 noon).

£20 IS ALL I am wanting for my Spectrum sound synthesiser + tape. Cost over £30. Will swap for hand-held C. B. or keyboard. Tel: (0241) 54106.

SHIP OF THE LINE, Snooker, Everest Ascent, Wheeler Dealer, All for CBM64. Swap for other CBM64 progs or sell £3 each. Tel: (0206) 45285.

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.

Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

Please write your copy in capital letters on the lines below.

Name.....

Address.....

Telephone.....

WANTED! SPECTRUM disk drive. Viscount, Cyborg or otherwise. Must work well, be reasonably priced, and fairly new. Write to: Mr Stephen Richards, 14 Braehead Drive, Barnton, Edinburgh EN4 6QL.

SPECTRUM SOFTWARE swap, to swap Dallas, Derby Day, Handicap Golf, plus 16/48 tapes 1 & 2 for any one of Hunchback, 1984, Chequered Flag or any good simulation. Jeff (021) 779 3026.

SPECTRUM OWNERS! Gilsoft's Quill wanted, will pay reasonable price or do part swap for my copy of Pogo. Contact Mr. Nicholas Forsyth, 8 Parkgrove, Loan, Edinburgh. No pirates — only originals.

DRAGON OWNER would like to swap ideas, progs etc with other Dragon owners. Contact Tom, 3 Wantage Woodside, Telford, Salop TF7 5PA.

WANTED 16K RAM pack for VIC 20. Ask for Craig or Gerry. Tel: 0743-81405 after 5pm.

SWAP ZX81 + 16K pack + manual PSU + £50 worth software. Only 3 months old. For 16-48K ZX Spectrum (issue 2 if possible). Tel: 683 0140.

SPECTRUM EDUCATIONAL swap s/w originals. ABC lift-off, countabout, Paddington, Shopping, Mix-up, Problem Picture, Alphabet. Tel: 01-800 6767 after 7pm. Also Sinclair Learn To Read.

COMMODORE 64 software to swap. Over 30 games and utilities on tape and disk. Phone: 0325 480298 and ask for Steve.

SWAP ATARI 2600 VCS including cartridges: Defender, Star-Raiders, Missile-Command & Combat. also 16K ZX81. Cost over £240. For 48K Spectrum Phone 0294 53556 (after 6pm).

SPECTRUM 48K swap/s Reliant Robin or Car with some MOT/Tax over £200 software 11 month guarantee Protek Joy/Int books, mags, tape/rec. M/Miner, Mooder 11, Ant Attack, Froggy, Zzoom, Flight Sim + many more. Tel: (0772) 709832.

WANTED DRAGON 32 s/w Tel: 01-223 2778 Mr Buxton.

WANTED SPECTRUM 48K with trimmings. Good price paid. Tel: 01-767 6109 — (eves only) Mr. Osbourne.

SWAP SINCLAIR ZX Chess (48k) and Cruising (16/48k) for Superchess 3.0 Tel: 051-430 8504.

WANTED — 48K Spectrum leads and manuals. Will pay up to £70. Phone Gary, Liverpool (Huyton) 051-480 1407 after 6pm.

COM X-35 WANTED. Swap for TI99/4A, perfect condition, as new, plus cassette lead, software, and books. Preferably Tyneside area. Outside area buyer collects. Phone (0632) 553158 after five. Ask for Ian.

SWAP OLYMPUS OM2N F1.8 + 80 200 O.T. 200M 2M Teleconverter + various other accessories. For BBC model B 1.2/OS or CBM 64 with C2N unit. Fred, Mkt Rasen (0673) 843127.

TO SWAP SINCLAIR/Artic Forth for Kempston joystick interface only. also Pimania for Snowball or Colossal Adventure. Tel: 01-594 2281 (after 5pm).

WANTED. CBM/PET wanted. Would even consider non-working earlier model. Please phone Chester 675717 after 6pm or weekends. Also require disc-based stock control program for 3000/4000 series PET.

SWAP ATARI V.C.S. with eleven popular games for ZX81 + 16K plus software and manuals. Tel: 0786 70581 after 6 or write to 30 Donaldson Pl., Cambusbaron, Stirling FK7 9LQ.

VIC 20 SWAP Adventure Land Cartridge E for any other Scott Adams Cartridge. Tel: 02357 4221 after 4pm.

SWAP DEVILS of Deep, Paras, Star-Trek, Fruit machine, the Orb, Ship of Doom, Dracula/Rock'n'Roll, for Inca Curse, Planet of Death: any four for The Quill: W.H.Y.: many more: Tony Fields 525685 (Armagh City) after 9pm.

WANTED ACORN Electron with some s/w for £100-£150. Tel: 01-500 5513 (after 5pm).

WANTED ATARI 810 Disk Drive. Tel: 01-487 4860 (after 6.30pm).

WANTED SPECTRUM 48K or CBM 64. Will swap Atari VCS + 6 games inc: Pac Man — Phoenix — Frenzy, with cash adjustment. Phone Horley (02934) 6284.

WANTED SPECTRUM 48K. Phone Mrs Gatnell on Buckley (0244) 545255.

SWAP VIC 20 Voodoo Castle for any other VIC 20 adventure game (03552) 29027.

SWAP URBAN Upstart + Invincible Island for Adventure Quest (Spectrum). Tel: Romford 67307.

SWAP Spectrum 48K boxed inc. Conbridge Computing joystick + interface, games inc: The Quill, Hobbit, Atic Atac, Androids for BBC B. Tel: Chris Otley 0943 465310.

GUIDE TO playing The Hobbit, as new, swap for Atic Atac, Lunar Jetman, Alchemist or any good software. Write to 144 Westerleigh Road, Downend, Bristol BS16 6AT.

WANTED 48K SPECTRUM. No software needed. Will be able to pay up to £50. Tel: 01-539 5402. Please ring after 6pm. Chung lo.

ATARI VCS games wanted. CBM 64 or VIC 20. Games offered in exchange. Ring Stevenage (0438) 811634 after 7pm.

WANTED SPECTRUM Hi-Res Graphics Unit + clock for 48K, disc-based handy model. I must have appropriate s/w. M. Rowland, 22 Westbourne Park Villas, London W2 5EA.

VIC 20 STARTERS pack for ZX Spectrum 16 or 48K or sell for £100. Tel: 01-748 9544.

COMMODORE 1541 DISC will pay up to £100 also musical software and a suitable keyboard. Tel: 0436 71598.

SPECTRUM PLUS cash adjustment in exchange for my BBC Model B (1.2) in new condition. Finance forces swap. Phone 0629 56771 can deliver 100 miles radius Derbyshire.

DUAL DISK DRIVES and interface for Sharp MZ80K or any Z80 based computer with dual disk drives. Colour not essential. Tel: 0602 733696.

URGENTLY REQUIRED. ZX81 adaptor 603 1206. After 5pm.

WANTED 16K Ram pack for Vic 20. Switchable or standard. Tel: Stevenage, Roger 0478 722389.

ADVENTURE HELPLINE

Magic Mountain on Spectrum. I can't find magic carpet. Anne Ellmes, 16 Forest Ave, Cefn Hengoed, Mid Glamorgan.

Voodoo Castle on Vic 20. How do I get past the Ju-Ju Bag? How do I get out of the jail cell? How do I get the wooden boards in the chimney? Andrew Spencer, 16 Lawson Ave, Grimsby.

The Count on Vic 20. 1) What use are the vents? 2) What do I do once in the crypt? S Parker, 96 Tithelands, Harlow, Essex.

Twin Kingdom Valley on Commodore 64. How do I get the master key off the dragon in the desert king's castle without being burnt to death? J C Ellis, The Vicarage, Gorse Terrace, New Tredegar, Gwent.

Black Crystal on Spectrum. How do I get across the abyss and through the temple maze and keep up enough spiritual and physical strength to carry on the quest? Trev King, Box House, 25 Ashby Rd Woodville, Burton-on-Trent, Staffs.

The Count on Vic20. How do I enter the vent in the crypt and how do I kill the bat? Michael Gargett, 42 Wright Cres, West Hill, Bridlington.

Pirate Cove on Vic20. Where can I find the second treasure? Kate Buckingham, 144 Elmwood Rd, Barnton, Northwich, Cheshire.

Lords of Time on Spectrum. How do I get out of the pit west of prairie in time zone 3? P J White, 24 Caldwell House, c/o West Park Hospital, Epsom, Surrey.

Valhalla on Spectrum. I've found Offrir, but I can't get Drapnir, and how do I open the chest in Hell? Colin Williams, 28 Erskine Rd, Colwyn Bay, Clwyd.

The Count on Vic20. How can I break the dark lens in the solar oven, is the crypt a dead end, and how can I get on to the castle roof? Simon Crowhurst, 35 Anerley Close, Allington Park, Maidstone, Kent.

The Hobbit on Spectrum. How do I get out the goblin's dungeon, and how do I get to the east bank of the river? Alistair Hayes, 4 Dawpool Drive, Bromborough, Merseyside.

The Quest on Vic20. How can I get the jewelled sword in the lower caverns? M Butterfield, 14 Bleasedale Ave, Clitheroe, Lancs.

Urban Upstart on Spectrum. How do you fly the plane? (I have the book, the flying suit, and I have inserted the key into the panel). Alex Hughes, 36 Ralph Rd, Shirley, Solihull, W Mids.

Espionage Island (1) and Adventure Quest (2) on Spectrum. (1) I get shot by helicopters when in boat. (2) Can't open the rusted iron grate, and can't reach orchid above head. Tim James, 12 Egan Close, Gatcombe Park, Hilsa, Portsmouth.

The Hobbit on Spectrum. How do you get back along the forest road without being killed? Is there a way back through the elvenking's halls? Mark Casey, 7 Marlston Ave, Lache Park, Chester.

Pettigrew's Diary on Dragon 32. I have found £600 to buy the train ticket, but who do I buy it from? Gary Price, 28 Larkhill Cottages, Olo Langho, nr Blackburn, Lancs.

Diary

Electron and BBC Micro User Show	Alexandra Palace London	July 19-21 10.00am-6.00pm July 22 10.00am-4.00pm	£3.00 adults £2.00 children	Database Publications 68 Chester Road Hazel Grove, Stockport 061-456 8383
Sinclair Computer Users Exhibition	Essex Exhibition Centre Moulsham Street Chelmsford Essex	July 21 10.00am-6.00pm	50p adults 30p children	Essex Exhibition Centre Moulsham Street Chelmsford 0245 25900
Scottish Personal Computer World Show	Assembly Halls George Street Edinburgh	July 26-27 9.30am-8.00pm July 28 9.30am-5.00pm	£1.50 adults £1.00 children	Scottish Industrial and Trade Exhibitions 8a Charlotte Square Edinburgh EH2 4DR 031-225 5486
2nd Official Acorn User Exhibition	Olympia 2 Hammersmith Road London	Aug 16 (trade day) Aug 17-19	£2.00 adults in advance £3.00 and £2.00 on door	Small Enterprises 20, Orange Street London WC2H 7ED

FACTORY FLOOR

Factory Breakout is a pretty striking new program from Poppy Soft — one of those small companies who has kept going in difficult times on the sheer quality of its programs.

Factory Breakout is a three part arcade game which rings enough changes on old themes to be pretty compulsive. You are a robot trying to escape from a factory; the first step is to be born — yes, problems start early for this robot. This involves swivelling round and round to shoot the laser beams zapping from all sides — its sweaty-palmed stuff.

If you survive this then there is a short, avoid things section where your robot must avoid rejection lasers (a bit easy this bit) and then on to a kind of vertical *Pacman*.

This section involves going up lifts and coming back down the screen via series of trapdoors which gradually change colour as you repeatedly pass through. You are chased by a group of monsters who are certainly related by blood to the *Pacman* ghosts. The only way to beat them is to 'eat' a sort of power wall for a few moments, the globs grin becomes fearful and twisted and you heap your revenge upon them. Cruel but just.

Program *Factory Breakout*
Price £5.50
Micro Spectrum
Supplier Poppy Soft
The Close
Common Road
Headley,
Newbury
Berkshire

CRYSTAL BALL

Classical looniness from Superior Software in the form of *Mr Wiz*. A program with one of those plots of such oddness you really can't imagine where they come from (drug crazed 16 year-olds I'll be bound).

Mr Wiz is a tax inspector. OK, I'm lying — *Mr Wiz* is a wizard and you have to move him around a garden eating cherries (why cherries? I don't know, perhaps they're easier graphically. Objecting to him eating cherries are gremlins —

these nasty personifications of thing that don't work properly will attack you and can only be stopped by lazer? No. Gun? No. Wand Zap? No. *Mr Wiz's* trained Doberman Pincher? No. They are stopped by *Mr Wiz* dropping apples on them or by him lobbing his crystal ball at them.



Additional facts you may want to know about this game are that gremlins may occasionally dig a tunnel to get you and that eating magic mushrooms earns you extra points. However this is the gremlins de-and having their dwelling demolished in such a humiliating fashion makes them very upset. You can see their point. Aside from the fact that Superior Software have a pretty good reputation, I should think the description of the game alone would be enough to make you want to rush out and buy it.

Program *Mr Wiz*
Price £7.95
Micro BBC B
Supplier Superior Software
Regent House
Skinner Lane
Leeds LS1 1AX

OBSTACLE COURSE

Tales of the Arabian Nights is the latest arcade release from Interceptor software who have been putting them out at quite a rate recently.

Like a lot of games recently this one is in that nebulous area where adventures and arcade games meet. Basically, what you get is a whole series of arcade games over several screens in which prince Kalen-

Pick of the week

GOTHIC MUSIC

You've seen the movie (assuming you're over 18 — if you're under 18 you probably sneaked it onto your parents video when they were out), now play the game which is even more harmless (in terms of creating deep seated repressed fears). The *Evil Dead* has been released.

The game has had a lot of coverage (by us admittedly) and could be a dreadful disappointment. Fortunately, it isn't. What it takes from the film is a shack for its setting and combat with zombies as its general aim; apart from that nobody gets raped by a tree, and there isn't much gore.

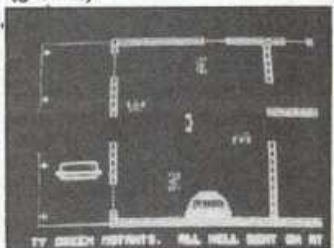
The screen display is of a top view of the shack — it scrolls left and right over three screens to fit it all in. Various items are displayed, a fire, a couple of beds, etc, and of course numerous zombies trudging about with arms outstretched like little green fork lift trucks.

However, these are occasional zombies (like occasional tables) since on occasion they revert to being your dear friends who came on a happy holiday with you to this lonely deserted place containing the fearful mystery ... now read on. (Actually have you ever known anyone go on holiday to lonely deserted places with evil mysteries that turns everyone into zombies — apart from Rhyll, of course, but I blame the bingo there — I mean why not go on a nice package tour to Benidorm or something.)

Anyway, aside from the intermittent Zombies, there are various objects that appear from time to time. Some of

these are obviously useful like axes (I think they are anyway) others, like what seems to be a toothbrush, seem less so.

In a way playing the game has as much in common with adventure and strategy as with bang bang reaction stuff — rather like *Atic Atac* you simply have to find out what does what by trial and error — so far I have discovered that if one zombie meets another zombie, then at least one of them becomes dismembered and nasty zombie legs, arms, etc, fly about, risking life and limb (geddit).



The other thing is that the Zombies do not always come straight for you — being zombies they are not too goal motivated and generally prefer to trudge about hoping something turns up.

Graphically, there isn't anything technically amazing here, but equally you won't be disappointed — what is important is the thought that has gone into the design of the game; you unearth its secrets slowly — like an adventure. As a bonus it has the most gothic opening credits and music on the demo mode I've yet seen.

Program *Evil Dead*
Price £6.999
Micro Commodore 64
Supplier Palace Software
275 Pentonville Road
London N1 9NL

der has to run and jump over several obstacles to win (poor woman) his princess.

As a game it's pretty good — there are a couple of features that lift it well above the run of the mill. One is the speech which narrates the story as you go along, more impressive is the musical soundtrack which is brilliantly arranged and designed, and tends

to prove just how important computer 'soundtracks' are going to be in the future.

Program *Tales of the Arabian Nights*
Price £7
Micro Commodore 64
Supplier Interceptor Micro's
Lindon House
The Green
Tadley
Hampshire

COMING SOON

Melbourne House will be releasing not one but two adventures around September time — *Sherlock Holmes* you will have heard of but *Zim Zalabim* may be less familiar.

The program represents what will surely be the next wave in adventure games where animated graphics are coupled with classic text adventure puzzles and plots. Indeed, the wave is only 'next' in that there's been nothing much on home micros in this country. In America, on machines like the Apple IIc, such games have been around from the beginning of this year.

It looks like *Zim Zalabim* will be the first such program in this country and it's on the Commodore 64. The unfinished version I played with was extremely interesting, although I think I'd better reserve critical judgement for the moment because important features like the graphics and plot are still expected to change.

To give you some idea, you begin standing outside a palace wall, you are a little man who can be moved left and right with a joystick and the same time more elaborate instructions can be typed in like a conventional arcade game.

Thus moving left you will come across (as the screen scrolls) a beggar; type *Examine beggar* and you will find out what, if anything, the beggar has that can help you. Typing *Look* makes the little man move his head left and right. Type *Go Forward* and you move on to a new scene, although you have to wait a few moments for the scene to set itself up.

Roughly speaking, as in *Valhalla*, 'physical' commands have physical consequences on screen; eg, *Climb Rope* makes the man climb a rope. In other respects it works like a conventional adventure printing a response to your input on the screen; eg, You look you see the castle walls... etc.

Where *Valhalla* used text input and animated graphics to create a new sort of adventure, *Zim Zalabim* is using similar concepts to bring life to more

familiar styles of adventure. I await September with some interest.

Program *Zim Zalabim*

Price

Micro *Commodore 64*

Supplier *Melbourne House.*

FOUR TASKS

Dimension 21 is a company, new to this country, in the Commodore 64 market. Its first release is *Spy School* a multi part, multi screen arcade game — each part representing a different task you have been set by your spy school masters to prove your spy mettle.

There are four tasks, *Sabotage* — blow up an enemy base, *Burglary* — steal a briefcase without tripping various alarms, *Sniper* — shot all the helicopters and *Escape* — a five screen maze with a variety of obstacles.

It's all very fast and furious with some nice animation. What's odd is that everything is so small — the little man you are moving around looks like something from an early Spectrum program. It's a bit of a shock to those of us used to large detailed sprites on Commodore games, but it doesn't in the end make too much difference. My main concern is that it's probably a bit easy — I managed two of the four tasks on the second attempt.



Program *Spy School*

Price £5.95

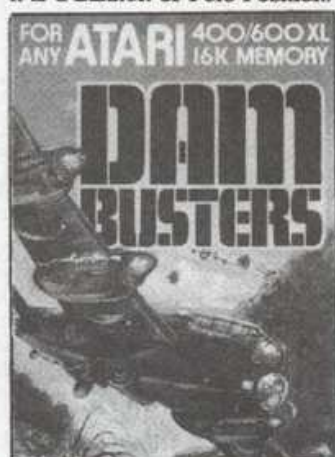
Micro *Commodore 64*

Supplier *Dimension 21
91 The Broadway
Southall
Middlesex
UB1 1LN*

BOMBS AWAY

Atari software for £5.50 is such a rare sight that it simply has to get a mention here. *Dambusters* is the program in question and despite the price there really isn't anything wrong with it at all.

Not I should add that there is anything very spectacular about it, but then the company producing it don't pretend that it is a *Zaxxon* or *Pole Position*.



What you get is a scrolling landscape dodge, shoot and bomb game where you pilot your Lancaster towards the Ruhr dams there to release your bouncing bombs and set back the German war effort for years (or days depending on which analysis you prefer).

Fight off baddie fighters, warships and anti aircraft fire, release the bomb at exactly the right moment, fly over a mountain and return home. It's a sort of scramble, but then it's sort of good fun and sort of cheap.

Program *Dambusters*

Price £5.50

Micro *Atari*

Supplier *NDSL
Newmarket Distribution
8 Green Street
Willingham
Cambs CB4 5JA*

SEVEN SEAS

Jolly Roger is a single key press adventure, but don't let that put you off it; its quite different from the norm and, up to a point anyway, I was quite hooked.

The idea of the game is to find some buried treasure — for this you need six clues once

you have found the correct island.

Clues can be discovered by trading with natives of the large number of lesser islands you come across on your travels. To trade you will need something to trade with; ie, doubloons (what use these are to a native I know not — perhaps they eat them, peasant communities aren't what they were.)

Aside from all this, you must sail the seas and look after the state of the ship and your crew, the former needs to be kept in good repair, the latter need to be fed.

The graphics are fairly simple, but reasonable and if you want to try something a bit different this is a good bet.

Program *Jolly Roger*

Price £5.95

Micro *Spectrum*

Supplier *Video Vault
140 High
Street West
Glossop
Derbyshire*

MULTIPLE CHOICE

If you think that answering multiple choice questions on a variety of subjects is a sensible thing to do with a computer then *Mustermind* is for you.

It's a range of data tapes from Silas Software on, at the moment with more to come, English, Poems, Books, Stories and Plays.

What these data tapes provide is 20 questions of these subjects answered by pressing one of four keys — the questions aren't based on any particular syllabus so you couldn't legitimately say the program was educational. So if you simply want to answer multiple choice questions on your computer look no further...

Program *Mustermind*

Price £4.95

Micro *Spectrum*

Supplier *Silas Software
24 Highcroft Gardens
London NW11*

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, Popular Computing Weekly, 12-13 Little Newport Street, WC2R 3LD.

ZX81

- 1 (-) Asteroids (Quicksilver)
- 2 (8) Chess IK (Artic)
- 3 (7) Flight Simulation (Psion)
- 4 (-) Football Manager (Addictive Games)
- 5 (1) Krypton Ordeal (Novus)
- 6 (3) Planet Raider (Novus)
- 7 (9) Space Raiders (Psion)
- 8 (4) Walk the Plank (Novus)
- 9 (-) Scramble (Quicksilver)
- 10 (-) Alien Rain (CRL)

All 16K except where indicated + 1K
(Figures compiled by Boots/Websters)

Vic20

- 1 (1) Computer War (Thorn EMI)
- 2 (9) Duck Shoot (Mastertronic)
- 3 (-) Submarine Commander (Thorn EMI)
- 4 (5) Flight 015 (Ferranti Craig)
- 5 (10) Tower of Evil (Thorn EMI)
- 6 (2) Tank Commander (Thorn EMI)
- 7 (7) Wizard and the Princess (Melbourne House)
- 8 (-) Undermine (Mastertronic)
- 9 (-) 3D Maze (Mastertronic)
- 10 (-) Snooker (Visions)

(Figures compiled by Boots/Websters)

Commodore 64

- 1 (6) Snooker (Visions)
- 2 (2) Beach Head (Centersoft)
- 3 (-) BMX Racers (Mastertronic)
- 4 (3) Solo Flight (Centersoft)
- 5 (1) Manic Miner (Software Projects)
- 6 (-) Orbitron (Mastertronic)
- 7 (-) Stellar Wars (Commodore)
- 8 (-) Harrier Attack (Durrell)
- 9 (10) Revelation (Softel)
- 10 (-) Hunchback (Ocean)

(Figures compiled by Boots/Websters)

Dragon 32

- 1 (10) Hunchback (Ocean)
- 2 (2) Outburst in Space (Microdeal)
- 3 (6) Chuckie Egg (A&F)
- 4 (5) Dragon Chess (Oasis)
- 5 (3) Hungry Horace (Melbourne House)
- 6 (1) Buzzard Bait (Microdeal)
- 7 (-) Space Shuttle Simulator (Microdeal)
- 8 (-) Kriegspiel (Beyond)
- 9 (6) Mr Dig (Microdeal)
- 10 (-) Dungeon Raid (Microdeal)

(Figures compiled by Boots/Websters)

Books

- 1 (-) Commodore 64 Programmers' Reference Guide, Commodore (Commodore)
- 2 (-) 60 Programs for the Commodore 64, Erskine et al (Pan)
- 3 (-) Very Basic Basic — Commodore 64, Ellershaw and Schofield (Century)
- 4 (-) Step by Step Spectrum Book 1, Graham (Dorling Kindersley)
- 5 (-) Sinclair QL Companion, Allan (Pitman)
- 6 (-) Step by Step Spectrum Book 2, Graham (Dorling Kindersley)
- 7 (-) A Guide to Playing Hobbit, Elkan (Melbourne House)
- 8 (-) 60 Programs for the Sinclair Spectrum, Erskine et al (Pan)
- 9 (-) Commodore 64 Games Book, Bishop (Granada)
- 10 (-) Step by Step Programming BBC Book 1 (Dorling Kindersley)

(Figures compiled by Bookwise)

Spectrum*

- 1 (2) Jet Set Willy (Software Projects)
- 2 (7) Jack and the Beanstalk (Thor)
- 3 (1) Match Point (Psion)
- 4 (-) Zaxxon (Starzone)
- 5 (5) Sabre Wulf (Ultimate)
- 6 (3) Fighter Pilot (Digital Integration)
- 7 (-) Lords of Midnight (Beyond)
- 8 (9) Trashman (New Generation)
- 9 (-) Paytron (Beyond)
- 10 (4) Blue Thunder (Foundry Systems)

*All 48K

(Figures supplied by W H Smith and Son, London)

Atari

- 1 (1) Bruce Lee (Datasoft)
- 2 (2) The Hulk (Adventure International)
- 3 (3) Encounter (Mogren)
- 4 (-) Captain Sticky's Gold (English)
- 5 (8) O'Ruley's Mine (Cosmi)
- 6 (5) Slinky (Datasoft)
- 7 (6) Zaxxon (Starzone)
- 8 (-) Flak (Sunsoft)
- 9 (4) Sea Dragon (Adventure International)
- 10 (-) Jetboot Jack (English)

+ 32K cassette + 48K Disc
(Figures compiled by Calisto Computers, 021 632 6458)

BBC

- 1 (1) Fortress (Pace)
- 2 (4) Overdrive (Superior)
- 3 (3) Aviator (Acornsoft)
- 4 (2) Micro Olympics (Database)
- 5 (-) Hunchback (Ocean)
- 6 (-) JCB Digger (Acornsoft)
- 7 (-) The Mine (Program Power)
- 8 (5) Spitfire Command (Superior)
- 9 (-) Jetpower Pac (Micro Power)
- 10 (-) Battle Tank (Superior)

(Figure compiled by W H Smith and Son, London)

REFERENCE

Advanced Machine Code Programming for the Commodore 64 is not a book for beginners — it deals in detail with the 6502/6510 processor discussing TTL logic gate operation, as well as the more usual areas of stacks, direct and indirect addressing and so on.

Appendices contain the instruction set, Ascii Codes, information on Hex to Decimal conversion. Certainly not suitable for the new owner but for others a useful reference work.

Book *Advanced Machine Code Programming for the Commodore 64*
Price £7.95
Micro *Commodore 64*
Supplier *Granada Technical Books*

*Granada Publishing Ltd
8 Grafton Street
London W1X 3LA*

GOOD GRIEF

It's funny how easily one gets strange ideas. Bernard Babani is a book publishers that specialises in pocket-sized computer books for a couple of pounds. Having also discovered that one of the companies' main authors is called Penfold — the name of Danger Mouses assistant who says 'good grief' a lot I am now firmly convinced that Bernard Babani must be a tiny little company in a tiny little office somewhere and feel immediately disposed to like its books. In fact, it may be part of some vast multinational publis-

hing house for all I know.

You should therefore view with suspicion my enthusiasm for *Micro Interfacing Circuits Book 1* — another little book from Babani. This is a book containing general advice as well as specific electrical information on connecting things into computers.

The book is definitely intended for people who have quite a reasonable degree of electrical knowledge rather than the merely curious.

Book *Micro Interfacing Circuits Book 1*
Price £2.25
Micro *General*
Supplier *Bernard Babani
The Grampians
Shepherd's Bush Road
London W6 7NF*

CHEAP

At under £100 the Dragon is definitely good value and there may be quite a lot of people who've just purchased one who could use *A Pocket Handbook for the Dragon*.

This short book is simply a collection of useful details arranged in an accessible way. Information is both straightforward facts — the screen arrangements for the various Pmodes, pins of the edge connector, etc.

Short but cheap, and genuinely useful, despite the rotter front cover.

Book *A Pocket Handbook for the Dragon*
Price £2.95
Micro *Dragon*
Supplier *Duckworth
The Old Piano Factory
43 Gloucester Crescent
London NW1*

This Week

Program	Type	Micro	Price	Supplier
The Night Sky	S	BBC	£9.90	Bridge
Beamrider	Arc	Commodore 64	£9.99	Activision
Blue Thunder	Arc	Commodore 64	£6.95	Richard Wilcox
Decathlon	Arc	Commodore 64	£9.99	Activision
H.E.R.O	Arc	Commodore 64	£9.99	Activision
Pitfall I	Arc	Commodore 64	£9.99	Activision
Pitfall II	Arc	Commodore 64	£9.99	Activision
River Raid	Arc	Commodore 64	£9.99	Activision
Toy Bizarre	Arc	Commodore 64	£9.99	Activision
Zenji	Arc	Commodore 64	£9.99	Activision
Strobe	S/Ut	Commodore 64	£1.99	SA Weir
Can You Count?	Ed	Oric	£3.95	Mellowsoft
Can You Spell?	Ed	Oric	£3.95	Mellowsoft
Catch-a-Key	Ed	Oric	£3.95	Mellowsoft
Hangman	Ed	Oric	£3.95	Mellowsoft
Picture Snap	Ed	Oric	£3.95	Mellowsoft
Play Maths	Ed	Oric	£3.95	Mellowsoft
Spell-a-Rhyme	Ed	Oric	£3.95	Mellowsoft

Tables Test	Ed	Oric	£3.95	Mellowsoft
Rapsallion	Ad	Spectrum	£6.95	Bug-Byte
Moons of Tantalus	Arc	Spectrum	£6.45	Cornhill
Zapper	Arc	Spectrum	£2.99	Anco
Physics	Ed	Spectrum	£7.95	Longman
The Duke	Ut	Spectrum	£5.95	M Alexander
Decimals	Ed	Vic20	£9.95	Chalksoft
Ephemeris	S	ZX81	£6.90	Bridge
Strobe	S/Ut	ZX81	£1.99	SA Weir

Key: Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



Name of the game

TV viewers who watch the ad breaks will have noticed lately a new campaign on their screens which suggests that no-one will soon have any problems getting to grips with that *bête noire* of the modern age, the microcomputer. Have no fear, suggests the ad; there is nothing to fear, because there is nothing to learn. Macintosh from Apple makes computers as easy as ABC. It kills computer languages dead, just as Bell's invention of the telephone killed Morse's code.

The campaign is filled out by full-page ads in the daily papers. One page in Morse code reads "Alexander Graham Bell has just invented the telephone". The next is a full page of computer code.

The third ad is the clincher. Disregarding gender difference in its sweeping claim of benefit for all humankind, the copyline proclaims "Apple has taught the machine about Man". The message is clear and effective. Don't strain your brain — just let the computer do the thinking.

It is a seductive message. Only grudgingly has the general public come to accept the computer. If you were in business, these little gadgets could well be useful. If you were a kid, there were some natty games to play. But the expense of life in learning how to use one was simply disproportionate. What use could this cumbersome, expensive and unreliable electronic box of tricks serve?

Now, however, the computer's proselytes are legion and vocal. The product is everywhere. No blame attaches to hating it; but no praise either. "Prove that I have a use for it" has given way to "Perhaps I could give it a try". It is in order to capture the uncommitted that Apple have cast their wide net. The lure is that you won't need to think about it. You don't want to think about it, do you? But if you could just start work with it, just like sticking a typewriter on the desk and hitting the keys, could you be tempted?

Firing up the machine is not so hard. The keyboard is familiar. The concept of keystrokes appearing as text on the screen can hardly deter any but the most determined ostrich. But seduced by your own rapid progress, it is hard not to get carried away by your own prowess, to make the machine do something — anything.

For the essence of Macintosh's "human-like" thinking lies in converting the operations of the computer into supposedly familiar images of the desktop. That the screen shows you is a load of doodles — "icons" — displayed in high-resolution graphics. A bunch of folders, empty unless you've already been at work. A clipboard. Plain paper. A notepad. A waste-bin. All the paraphernalia of cut-and-paste.

Is the desktop metaphor, derived from Xerox's work in Palo Alto on the Star system, desirable or useful? I would say no — on both counts the computer is being sold short. Let us examine Apple's claim that Macintosh makes computing easy. The screen image of human tasks makes learning how to use the computer intuitive, it is claimed. Every picture worth a thousand control codes. At first, the novice learns quickly. It's fun.

But in the long term work, work with a computer is not easy. You can never be less than explicit in what you want it to do. It won't intuit your thoughts, nor will it help you unscramble your balance sheet. If words are your business, all that iconography gets between your thoughts and their expression. If money is your game, you still have to understand financial analysis. Only the computer is easy: if your work is difficult, it will remain difficult.

Another major claim is that you may exchange data files among applications programs. But, like the screen icons, this is only useful at the presentation level. Much is made of the fact that you can import graphics from spreadsheet, print out the results in lots of different typesets, etc. That is what the demos are all about. But is this useful? Yes — but only because the result — let us call it a management report — expresses "computing style". It is window-dressing.

If the report is duff the computer cannot enhance the feebleness of the content. And for the content to be good, to make use of the computer's true processing power, its operator must understand difficult and sometime tiresome concepts.

And this is where Apple's advertisements sell computing short. By suggesting, albeit indirectly, that the computer will do the thinking for you, it will sell a lot of computers. This is, of course, the name of the game.

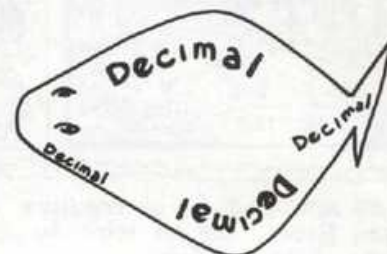
Martin Hay

Decimal place

Puzzle No 117

If you are looking for an excuse not to be out enjoying the good weather then try this.

The reciprocal of ninety-seven — as a decimal value — is 0.010309.



That's fine as far as it goes, but it only gives the value to the first few decimal places. What happens if we wanted to find the value to ten decimal places, or a hundred, or a million?

What is the value of the ninety-first decimal place?

Solution to Puzzle No 112

In each case £100 is deducted from each of the scores, the balance representing the actual amount won. The two *For-Next* loops represent the numbers of the two types of correct answers given, and variable *C* is the number of incorrect answers (the balance of the twenty questions). The score is then computed and printed if it agrees with any of the three scores obtained.

```
10 FOR A = 0 TO 20 20 FOR B = 0 TO 20 30 LET C = 20 - (A + B) 40 SCORE = 30 * A + 24 * B - 15 * C 50 IF SCORE = 368 OR SCORE = 381 OR SCORE = 102 THEN PRINT SCORE, A; B; C 60 NEXT B 70 NEXT A
```

So, the contestants results were: Arlene 7 difficult, 9 easy and 4 wrong; Darlene 3 difficult, 14 easy and 3 wrong; and Marlene 2 difficult, 8 easy and 10 wrong.

Winner of Puzzle No 112

The winner is John Brunson, Estcourt Road, Gloucester, who receives £10.

Rules

If the puzzle can be sensibly solved using a computer, then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 117 is August 10.

The Hackers



LADY CLAIR IS HELPING THE PIMAN WITH HIS ROLE IN THE FORTHCOMING PIROMANIA... (A HOT GAME FROM AUTOMATA)

... THEN WHILE HE'S MAKING WITH THE EXTINGUISHER, YOU'RE SETTING FIRE TO...



A BOTTLE!

I DON'T THINK MOLTEN COCKTAILS ACTUALLY COME INTO THIS GAME...

NO... A BOTTLE HAS JUST WASHED UP ON THE BEACH!



BIG DEAL! WE'RE SUPPOSED TO BE WORKING!

LOOK... A MESSAGE



'To Whom it may concern: I, Crusoe, am stranded on a remote island, victim of a shipwreck...



"I am searching for ye treasure of William Bones, but am beset by ye nasty killer spiders....



YECH!



"His writings are coded, and I seem to spend most of ye day walking round and round ye volcano, getting nowhere hastily...

"Bones himself is no company nor help, as he is no more than another bleached skeleton. Only he knew the secret of escape, but he perished... the silly perisher...



the annual AUTOMATA adventure is here!

CRUSOE

for 48K SINCLAIR ZX SPECTRUM: MACHINE-CODE ANIMATED GRAPHIC & TEXT ADVENTURE. Free music flipside!!! by Dan DeJoe & the Castaways. PROGRAM BY JON SMITH and artwork by Gremlin-Evans. Shipwrecked and stranded, on ye remote island, with nothing save a bottle of Granny's patent elixyr, an empty stomach, ye starts that he stands up in ... and Thou. Ye Adventure is only just beginning. Enjoy it before it enjoys you.

PLEASE SEND ME "CRUSOE" for 48K Spectrum @ SIX QUID.

MY NAME.....

MY ADDRESS.....

.....POST CODE.....

I ENCLOSE YE SUM OF £6 INCLUSIVE PRICE, or please DEBIT MY ACCESS / VISA CARD, number:-

send to: AUTOMATA U.K. LTD. 27 HIGHLAND ROAD, PORTSMOUTH, HANTS, PO4 9DA, ENGLAND, or phone our 24-HOUR CREDIT-CARD HOTLINE on 0705 - 735242.....

Gremlin-Evans



"In ye water, I am plagued by jellyfish, whose flavours I like not, by George!!

"I have found an assortment of unusual objects whose purposes evade me. Please send help! Yours etc."



JOIN THE PIMANIACS

HEY THIS COULD MAKE A GREAT VIDEO GAME... LET'S SELL THE IDEA TO AUTOMATA!



IT SEEMS THERE MUST BE OTHER BOTTLES FLOATING ABOUT! CHAP CALLED JON SMITH'S DONE THAT... AUTOMATA HAVE RELEASED 'CRUSOE' ALREADY.

GADZOOKS! DOES THAT MEAN THERE IS HOPE FOR

CRUSOE



ORDER YOUR COPY OF THIS EXCITING, PERPLEXING & HILARIOUS NEW GAME, AND BY-PASS ROY PLOMLEY!