

AN ARGUS SPECIALIST PUBLICATION

AUGUST 1983

75p

**Add-on
Action Inside**

Personal Computing Today

KEES v K.

THE AQUARIUS
Mattel's
rising star?

TI TACTICS
A strategy
game to play

**Software to
key-in for
Commodore 64,
VIC-20, BBC,
TI99/4a,
Atari,
Oric,**



Checklist
Step inside
our software
supermarket



**Reach the
Spectrum's
outer limits in
software Reviews**

Sniper – for the Dragon 32

Are you fast? ... are you good? ... can you shoot straight? ... Here's your chance to prove it. Not just another shoot 'em up game, but the ultimate in hit 'em fast, and hit 'em hard games – but this is no game ... your life is at stake!

Fast action machine code game, which calls for a steady trigger, and nerves of steel. 10 levels of difficulty, joystick controlled gunsight, high res graphics and sound. "Smart" targets!!
Game design and dragonware: R. Lowry

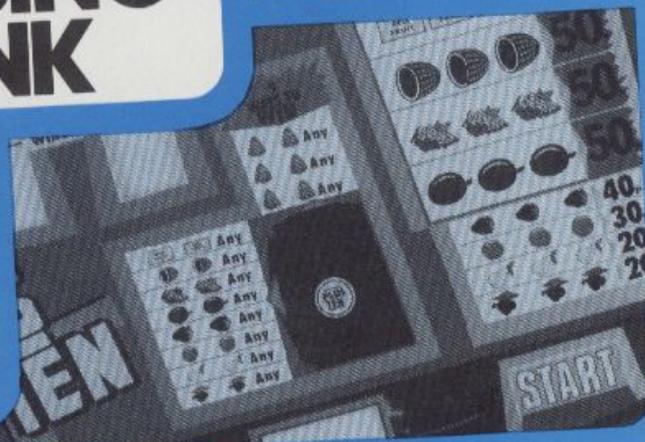
Cosmic Defender – for the BBC model B

"I thought I could do it ... now I'm not so sure, 'Hang on to 'em at all costs' were the orders from star command, it could cost me more than I bargained for! Even with the best star fighter in the galaxy!! I've got to hang on ... keep going ... must fight ... but for how long?..."

Defend the federation Plasmaton fuel dumps from the mindless suicide pilots of the alien battlefleet. Use your cosmic starfighters weaponry and hyperspace to destroy the evil enemy ... but watch your fuel, bonus points and fuel cost blood!!! How long can YOU hold out in this fast action game by Anthony Rafferty.



THE MISSING LINK



Acnean Mutoids – for the BBC model B

"Where am I"?. A reasonable question, but the shock answer is only the first in a series of catastrophes that might lie ahead ... A bolt of lightning stabs your eyes as the monitor awakes you from stasi-sleep, only to tell you the worst!

Your interstellar cruiser has been invaded by the evil race known as the acneans – even worse, you are alone!!

In a micro-instant you realise the task that faces you is one of spine-tingling terror – you must risk all to save earth from a horrific destiny. Can you avoid the blood dripping, plasma curdling mutoids and activate the ship's self destruct computer – do you have the courage? Can you save mother earth??, can you save yourself??? the answer is surely ... how??? Superlative graphics and sound make this game by Phil Woodrow, the ultimate challenge!

All of these superb games **£6.50** each, inc first class post, packing and VAT.

All orders despatched within 24 hrs of receipt.

Available from all good software outlets or direct from Soft Joe's.

Dealership enquiries to:

Soft Joe's Software, Business Centre, Claughton Road, Birkenhead, Merseyside.

Coming soon – games for VIC 20, Commodore 64, ORIC, Spectrum and Atari.
(Ref HCW)

Bandit – for the Dragon 32

Ruthless ... that's the only way to describe it, try your luck against the meanest fruit machine in the universe. 1,000 credits and you break the bank. It's not easy, but then, you wouldn't expect it to be would you???

You can almost feel your pocket getting lighter in this full feature fruit machine game. Based on a real 20 symbol per reel machine, this superb simulation displays excellent high res colour graphics and realistic sound: random hold and nudge facilities, with the meanest, most vicious gamble feature in the west! without doubt, the most compulsive addictive fruit machine on the market. Specifically for people with deep pockets and money to burn.

Game design and dragonware: R. Lowry

Soft Joe's is the one for me, please rush me () copies of
 Acnean Mutoids } For BBC Bandit } For
 Cosmic Defender } Model B Sniper } Dragon 32
 (tick box).

I enclose cheque/P.O. for £ payable to Soft Joe's Software.

Name

Address

Post coupon to: Soft Joe's Software, Business Centre, Claughton Road, Birkenhead, Merseyside.

Personal Computing Today

VOLUME 2 NUMBER 1 AUGUST 1983

Editor:

Elspeth Joiner

Editorial Assistant:

Chris Palmer

Advertisement Manager:

Beverley McNeill

Advertisement Executive:

Heather Ranson

Managing Editor:

Ron Harris

Origination and design by:

MM Design & Print

Managing Director:

T J Connell

Published by:

Argus Specialist Publications

Ltd.,

145 Charing Cross Road,

London WC2H 0EE

01-437 1002

Printed by:

Alabaster Passmore & Sons

Ltd.,

London and Maidstone

Distributed by:

Argus Press Sales & Distribution

Limited, 12-18 Paul Street,

London EC2A 4JS

Personal Computing Today is normally published on the first Friday in the month preceding cover date. The contents of this publication including all articles, designs, plans, drawings and programs and all copyright and other intellectual property rights therein belong to Argus Specialist Publications Limited. All rights conferred by the Law of Copyright and other intellectual property rights and by virtue of international copyright conventions are specifically reserved to Argus Specialist Publications Limited and any reproduction requires the prior written consent of the Company. © 1983 Argus Specialist Publications Ltd. All reasonable care is taken in the preparation of the magazine contents, but the publishers cannot be held legally responsible for errors. Where mistakes do occur, a correction will normally be published as soon as possible afterwards. All prices and data contained in advertisements are accepted by us in good faith as correct at time of going to press. Neither the advertisers nor the publishers can be held responsible, however, for any variation affecting price or availability which may occur after the publication has closed for press.

Subscription Rates. UK
£12.25 including postage.
Airmail and other rates
upon application to Personal
Computing Today,
Subscriptions Department,
513 London Road,
Thornton Heath, Surrey
CR4 6AR.

This month *Personal Computing Today* has its first birthday. Marking our first anniversary are reviews, programs, and features galore.

The newly released **Aquarius** computer has the wraps taken off it by our reviewer. We give you all the technical, practical and price details of one of the latest computers to be on sale. It will be interesting to see whether or not this computer, produced by a toy manufacturer, will fare as well as the Dragon — also developed and brought out by a toy firm. At one point the Dragon was selling so well that the manufacturer was having trouble meeting the demand for the machine.

On the program side there's plenty of variety for micro owners. Commodore users can make the most of a great adventure game which runs on the VIC 20. Based in and around Jerusalem it's a game of quick-thinking and strategy called the **Citadel** in which you must defend a citadel against a band of evil-minded brigands. A character defining program comes to you in the form of **Character Builder** which BBC Micro owners will find useful.

Getting into the summer frame of mind is a program for arcade game fans in an amazing game called **Krazee Kong**. It follows the pub arcade game fairly closely and runs on the Atari computer.

Our first Commodore 64 program takes the form of a classic computer game, **Grand Prix**. This shows just what the Commodore 64 can do and gives users a good opportunity to try out various facilities of the computer.

Regular features include peripherals reviews in **Add-on Action**, piles of programs under scrutiny in **Software Reviews**, the **Factfile** for prospective buyers to peruse, and the **Software Checklist** for you to check out software for your computer.

Don't forget *Personal Computing Today* is always on the lookout for good articles to publish. If you have written an article about a certain aspect of programming for a particular computer, or come up with a good idea for a program why not send it in to us for possible publication in the magazine? If you submit a program to us don't forget to include typewritten details on How it Runs, Hints on Conversion as well as a cassette with full loading instructions and a clear printout of the listing.

One vital thing, remember to put your name, address and telephone number on your article/program submission. All material which we publish is paid for and if you don't give your address we cannot get in touch with you to let you have your hard earned money.

ABC

PRINTED IN THE UK
BY ABC

Turn over
the page for a full
contents list of this issue.

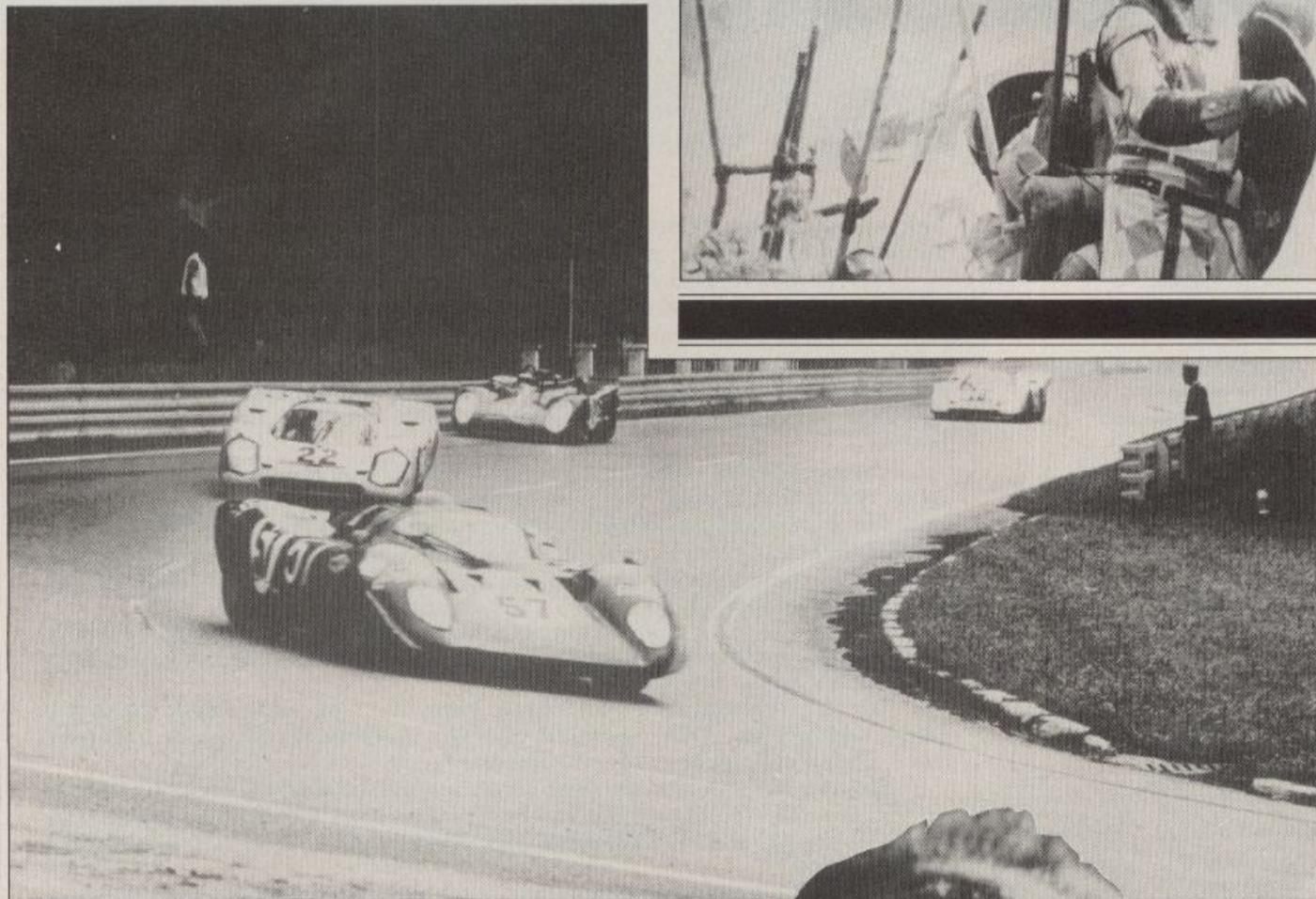


NEWS

News 8
Keep track of what's coming and going on the micro scene.

NEXT MONTH

Next Month 12



CBM 64

SOFTWARE

Grand Prix 16
Fancy your chances as the James Hunt of the computer world? Well now is your chance.

LETTERS

Your Letters 22
Your chance to have your say about what goes on in the computer world.

ORIC

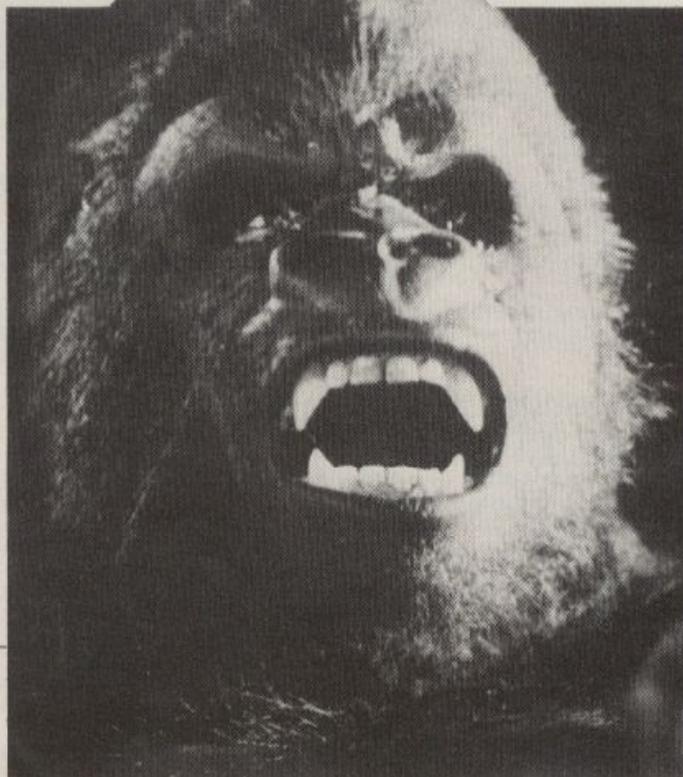
MICROSPOT

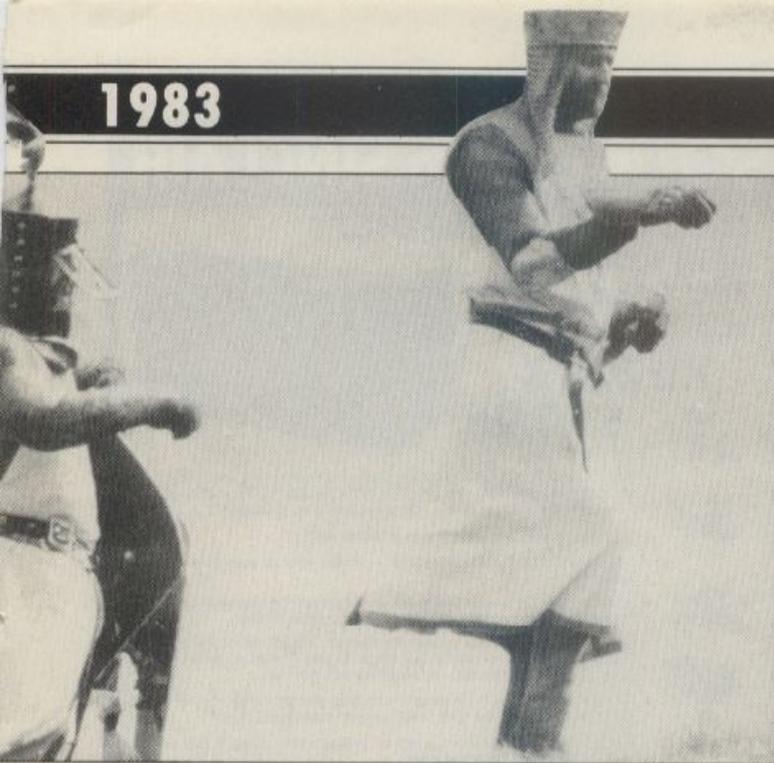
Oric Demo 26
Just starting with your Oric? Try out this demo program and see what it will do.

ATARI

SOFTWARE

Krazee Kong 30
Evade the deadly barrels and climb precarious ladders in an effort to reach Krazee Kong.





BBC

SOFTWARE

Character Builder 78
Design your own custom characters the easy way.

REFERENCE

Hardware Factfile 85
Looking for a micro? We help you find the right one.

REFERENCE

Software Checklist 95
Searching out secretive software? The checklist will help you run it to ground.

REFERENCE

Micro Terms 110
'Computerspeak' made easy!!

VIC 20

SOFTWARE

Citadel 36
Can you brave the bands of marauding brigands and finally free the Citadel?

LETTERS

Micro Answers 43
These pages allow you to make your problems someone else's.

REVIEW

Software Reviews 49
What's new on the computer scene. We tell you which software is worth buying and what is worth 'binning'.

TI99/4A

GAMESBOARD

Gorillassi 57
Explore variations on a theme of Othello with our Texas program.

PERIPHERALS

Add-On Action 65
More peripherals for you to plug-in and stick-on to your computer.

AQUARIUS

REVIEW

Aquarius 72
Herald of a new computer age or mutton dressed up as lamb? We give you the facts.



S P E C T R U M

GAMES — UTILITIES — EDUCATIONAL
75% CREDIT DISCOUNT SCHEME

CASSETTE 1.

£4.95 (48K)

Two games for all tastes. A fast action numbers game with high-res graphics, plus a game of logic and skill. Don't buy it unless you have a cool head under stress.

CASSETTE 2. (CHEMAL)

£8.50 (48K)

Finding Chemistry a bore? Forget those dry text books. Learn the techniques of chemical analysis and have fun at the same time with this program.

Full graphics.

CASSETTE 3. GRASP

£6.50 (48K)

Full colour graphs, histograms and pie charts, plus text and draw modes. All you are ever likely to need for picture creation in one program.

CASSETTE 4. MATCAL

£9.50 (16K)

Matrix operations at your fingertips. Applications include multivariate trend prediction, network analysis etc.

★ ★ MANY MORE, SAE FOR CATALOGUE ★ ★

CAMEL MICROS, 33A COMMERCIAL ROAD,
WEYMOUTH, DORSET. (03057) 70092

SOUND with SINCLAIR

MAKE AMAZING SOUND EFFECTS
WITH YOUR ZX 81,
TIMEX Sinclair 1000
or SPECTRUM



THE ZON X

£25.95

incl p&p & VAT



• The ZON SOUND UNIT is completely self-contained and especially designed for use with the ZX 81, TIMEX Sinclair 1000 and Spectrum Computers. It just plugs in — no dismantling or soldering.

• No power pack, batteries, leads or other extras.*

• Manual Volume Control on panel — ample volume from built-in loud-speaker.

• Standard Sinclair — 16K Rampack or printer can be plugged into ZON X Sound Unit without affecting normal computer operation.

• Huge range of possible sounds for Games, Music, Helicopters, Sci-Fi, Space Invaders, Explosions, Gun-shots, Drums, Planes, Lasers, Organs, Bells, Tunes, Chords, etc. — or whatever you devise!

• 8 full octaves. Uses 3-Channel sound chip giving programme control of pitch, volume of tones and noise, all with envelope control.

• Easily added to existing games or programmes using a few simple "BASIC" lines or machine code.

• No memory addresses used — I/O mapped.

FULL instructions with many examples of how to obtain effects and the programmes, supplied. Fully guaranteed. British Made.

*Except with Spectrum, you need the Spectrum Extension Board Order No. SE1 — PRICE £6.80 inc. VAT.

Payment may be made by Cheque, P.O. Giro No. 388 7006, Postal Order or Credit Card.

Export orders: Bank Cheque, International Money Order, U.S. * or £ Sterling.

BI-PAK

Dept PCT P.O. Box 6
63A, High Street
Ware, Herts.



Access & VISA accepted
Ring 0920 3182 for
immediate despatch

MACE

EDITOR / ASSEMBLER / MONITOR
by Graham Trott



DRAGON 32 CARTRIDGE

£ 29.95

INCLUSIVE OF VAT & POSTAGE
VISA/ACCESS ACCEPTED

WINDRUSH MICRO SYSTEMS
WORSTEAD LABORATORIES, NORTH WALSHAM, NORFOLK, ENGLAND. NR28 9SA
TELEPHONE (0692) 405600 DEALER ENQUIRIES INVITED

D A COMPUTERS OF LEICESTER B.B.C. ACORN COMPUTERS

Specialists on hardware and software • Fully authorised ACORN-B.B.C. Dealer • Complete after sales service — repairs and maintenance contracts

BBC Model B Microcomputer.....	£399.00
BBC Model B+Disc interface.....	£470.51
BBC Model B+Econet.....	£447.51
Single Disc Drive (BBC-100k).....	£264.50
Single Disc Drive (DAC-100k).....	£213.00
Dual Disc Drive (DAC-100k+100k).....	£402.50
Dual Disc Drive (BBC-400k+400k).....	£800.00

(All disc drives come complete with manual, utilities disc and interconnecting cables)

Complete upgrade A to B (including test) ... **£91.00**
Partial upgrades at equally attractive prices.

We have a wide selection of Printers including EPSON FX80, RX80, Seikosha GP100, GP250, Juki Daisy Wheel Printer — **£458.85**

14 inch Colour Monitors.....	£269.00
12 inch Monochrome Monitor.....	£100.00
Shinwa CTI-CP80	
Cassette Recorders.....	£39.00
Games joysticks.....	£19.50
BBC Paddles.....	£13.00

Most of the best software in stock including Acornsoft, Programpower, Computer Concepts, Superior Software, Nibblesoft, Fisher-Marriott etc. A wide selection of Books, Magazines and accessories. See a demonstration of the PLS Digitiser **£120.00**.

Please call and visit our new showrooms at:
LEICESTER 549407

D.A. COMPUTERS LTD.,

104, London Rd., Leicester. (2 mins from Rly Station)

A NEW SERIES FOR FIRST TIME USERS

"Learning to Use" is a new series of books which introduces newcomers to the most widely used micros in the marketplace.

The books assume absolutely no knowledge about computers and the reader is shown even the most fundamental operations such as "switching on" and "loading a program". The books lead the reader through simple programming and then on to graphics, with several programs which show how to achieve pictures and even animation!

The user-friendly approach is consistent throughout the text – not only are program listings clearly shown, but in many cases, a photograph is included to show what the program looks like when actually loaded and run!

All books in the series are £5.95 (incl. postage).

Gower

*To be published
June 1983*

*Learning to Use the Oric 1
Computer*

*Learning to Use the Lynx
Computer*

READ-OUT



Order Form to: **READ-OUT BOOKS AND SOFTWARE**
NEWTECH PUBLISHING LIMITED, 8 FORGE COURT,
READING ROAD, YATELEY, Nr. CAMBERLEY, SURREY.
24 hour Answering Service Tel Yateley (0252) 873373

Name _____

Address _____

Make cheques payable to Newtech Publishing Ltd I enclose my cheque for £ _____

Please debit my Access Signed _____

Number _____ Date _____

NOW AVAILABLE
Please send me copy/ies
all at £5.95 each
(incl. postage & packing
(Allow 14 days for delivery.))

<input type="checkbox"/> Learning to Use the PET Computer	<input type="checkbox"/> Learning to Use the VIC-20 Computer
<input type="checkbox"/> Learning to Use the BBC Microcomputer	<input type="checkbox"/> Learning to Use the ZX81 Computer
<input type="checkbox"/> Learning to Use the ZX Spectrum	<input type="checkbox"/> Learning to Use the Dragon 32
<input type="checkbox"/> Learning to Use the Apple II / IIE	<input type="checkbox"/> Learning to Use the T199/4a
<input type="checkbox"/> Learning to Use the Commodore 64	

To be published
Please reserve for me, and send to me on publication my copy ies of
all at £5.95 each
(incl. post & packing)

<input type="checkbox"/> Learning to Use the Oric 1	<input type="checkbox"/> Learning to Use the Lynx
---	---

NEWS NEWS NEWS

Bytes With A Beat

Nowadays, the videos which accompany pop singles are getting to be quite commonplace. EMI records however have gone one step further with their latest release. The single, called Camouflage, features a rather different B-side. Flip the single over and you have 3 computer programs for the ZX81.

The first of these programs is designed to run in conjunction with the A-side of the single. What you do is load the program off the B-side into a 16K ZX81. You then flip the single back and play the A-side. As soon as you hear the music start, push a key on the keyboard. The ZX81 will now keep pace with the song, delivering the lyrics as they are sung and providing a graphics display at the same time.

Complimenting the video-program on the B-side are two arcade style games. Called Flying Train, the game has you trying to land the top half of a steam train onto the carriage which is parked in the sidings. The third program is a 1K version of the same game.

The brains behind the single is a 27-year old Mancunian rock entrepreneur, Chris Sievey. He has been recording songs from as far back as 1974 including the intriguing 'I'm In Love With The Girl On The Manchester Virgin Megastore Checkout Desk'.

The whole project started at the beginning of the year when Chris bought a ZX81 to help him put titles on a video he was working on. He wrote the Flying Train game in the first few months. He then carried the idea further and ended up with the computer video. He approached EMI with the package at a time when they were getting increasingly worried about the loss in record revenue, it mainly going to the manufacturers of computer software. EMI saw the possibilities of the record/software combination and released the single.

EMI are being guarded at the future of these computer singles, but if Camouflage is a success then we could see a lot more of these sort of things. In fact, records could be the big new way to buy software, especially when you compare the price of single to the price of a software cassette.

Who knows, maybe *Personal Computing Today* will be running a Top Ten in the near future. By the way, the single's great.



Comx Coming

Just come onto the computer scene is the made in Hong Kong Comx 35.

Its vital statistics are a price tag of £119.95, colour graphics, and a built-in joystick. Made and sold through UK distributors by Kowloon based Germaine Video it should be on sale any time now. The Comx 35 is oblong in shape and coloured black and gold with black keys.

Design wise it is intended to be used for a whole spectrum of applications, some of those cited by Alsy Computers (the UK name of the Hong Kong firm) are scientific, educational, business and for your own entertainment from games playing.

It has an impressive list of facilities and capabilities including the fact that it is based around the same processor used by America's NASA satellites and the Space Shuttle. Because of this, reads the advertising blurb, the Comx 35 has

'superb graphic and sound capabilities'.

There is 32K of user memory available, which is expandable up to 667K, and 16K ROM of 'super enhanced BASIC'. Screen size measures up to 24 rows x 40 characters of high resolution graphics, which is pretty standard. Altogether there are eight background colours and the same number of foreground colours, with a 12 combination of colours and characters for your use.

Scheduled for production from June are several peripherals including a standard RS232 interface, a four colour printer and plotter, 5¼ inch floppy disc drive, an expansion box and a speech synthesiser unit.

Just how the new Comx 35 stands up to a real test of usage read for yourselves in next month's copy of *Personal Computing Today*. We have had the machine on test and will present you with a full review in our September issue.

PractiCalc-ly Speaking

Practical help is now on hand for business Commodore 64 users.

Marketing Micro Software has recently brought out PractiCalc which the firm claims to be 'the first professional spreadsheet for Commodore 64 and VIC-20 users'.

It costs only £30 and is available on disc or cassette and contains some functions not usually included in similarly priced programs. These are a fast 'seek and search' facility which can find individual areas or throughout the entire spreadsheet, and a 'sort' function which rearranges data from lowest to highest, or vice versa. It

also handles graphics if required.

The makers claim that the screen presentation is remarkably clear and has a four colour display. It performs over 20 mathematical calculations including all BASIC functions and can carry out row and column operations.

PractiCalc also runs on a VIC-20 with 16K memory yet the firm says it offers as much problem solving ability as programs costing three times as much.

For further details contact Marketing Micro Software, Goddard Road, Whitehouse Industrial Estate, Ipswich, Suffolk. Alternatively, try telephoning 04373 462721.

NEWS NEWS NEWS

Painting by Computer Numbers

Artificial intelligence fans who have an artistic bent will have to make a trip to London's Tate Gallery to see a special exhibition of computer executed drawings.

British artist Harold Cohen has been heavily involved in computerised drawings for fifteen years and his program named Aaron is the latest result of his work with artificially intelligent machines.

Cohen has written the program Aaron to produce drawings using his own knowledge of image-making. He has applied this knowledge to enable a computer, a DEC VAX-750 mini computer, to generate in infinite number of unique and original drawings.

The pictures produced are not what people traditionally believe to be computer graphics — straight lines, and blocks of colour sometimes forming amazing patterns on a screen. Cohen's computer produces pictures from the artists' own conceptions of art. The results are abstract line drawings, which you would think had been done by a person.

Cohen's drawing machine looks very much like a plotter. The equipment used in this exhibition are four computer driven drawing machines. Each machine is linked to its own computer and these are hooked up to the main DEC machine which is the host computer. The drawings are made by a pen attached to a long arm which is driven by two motors and programmed to respond to the master program.

Open from June 8 until July 24 this year the exhibition is being held at the Tate Gallery on the embankment near Waterloo and Embankment tube stations. It is on show in galleries 47 and 48 and for further information telephone the Tate Gallery on 01 (if you're outside London) 821 1313.

Virgin Goes Gaming

Recently record companies have been spreading their wings into the computer field and Virgin is no exception.

The latest trick is a clever marketing ploy in the form of putting a computer program on one side of a tape and music on the other. Virgin has just signed on its first batch of would-be whizz-kid programmers who are supposed to be bursting with hot games ideas with which to stun the world.

And Virgin has plans to put the rock singer Steve Hillage, who records on the Virgin Records label, on the reverse side of the first commercially available Virgin products.

These were released in mid-June and unfortun-

ately just missed our deadlines. But *Personal Computing Today* should be taking a look at some of them in the next issue's software review pages.

Virgin launched into the computer scene in February of this year and put out a plea to all programmers with a talent for producing original games programs to get in touch. The firm's managing director Nick Alexander said: 'We had a fantastic response with over 500 games sent in, and the overall standard was so high that it made the selection process very difficult. The final choice of eight games was determined by their originality and entertainment value.' The eight authors aged between 16 and 32 were consequently signed up by Virgin Games.

A Baron Full of Laughs

In between today and the last issue of *Personal Computing Today* the improbably named Baron Ironblood built a giant combat machine in the form of a giant cobra.

Not any old cobra though. This one drops venom from its fangs and emits deadly laser beams from its eyes. The Action Force had better watch out. Their recruits can either be vaporised to reappear at enemy headquarters or beamed up (just like Scotty) into captivity.

But all is not lost in this latest video game from Parker Video running on the Atari VCS. The Action Force recruits can be protected by an atomically powered energy shield and can retaliate with eight well-aimed shots between the giant cobra's eyes. That ensures instant death.

Perhaps Baron Ironblood isn't that bad after all. This game displays an interesting feature altogether lacking in contemporary video games. The player can choose which side he wants to support.

As the Action Force leader, your aim is to destroy the cobra while protecting your recruits. But if you take the part of the cobra, the object is to capture all four Action Force recruits.

Action Force features 'eye-catching' graphics and four difficulty levels and can be played by one, two or three players. If you take the three player option the game really gets going with both paddles and joystick in use in a two-against-one battle with the enemy.

Parker's new game costs £29.95 and is on sale at all Parker retail outlets.



Colour Genie

In the July issue of *Personal Computing Today* the price of Lowe Computer's Colour Genie was incorrectly stated. The

correct cost of that computer is £195.20 excluding VAT. Our apologies to Lowe Computers for the misprint.



THE CONFLICT GROUP
presents the synthesis of thought
and power in a package of
plasma hotter than the sun
and faster than light.

Using quantum leaps we
have bridged time and
space with kilometres of
tape and megatonnes of
paper:— Stoke Newington's
FINEST HOUR!!!!!!!

TIME LORDS

At the beginning of time there were 5 great races with their home bases on the planets of Skaro, Mondas, Vortis, Neston and Earth. Then after the treaty for non intervention was broken each race hired one of the all powerful Time Lords to make theirs the most populous and powerful in the known universe.

The Time Lords travelled throughout the space-time matrix influencing wars which their employers had lost and setting "timetraps" to deter their enemies. They also used a host of scanning devices in order to monitor the universe and to locate and destroy their opponents.

Eventually all the Time Lords exhausted their numerous energies or were killed, and the master race emerged to continue life into the infinite.

THE FIRST REAL GAME FOR ANY MICRO COMPUTER!

This is not an arcade game — players can take as long as they like over each move. This is **not** an adventure — up to five players can play. This **is** the first real replacement for a board game — the first real tactical computer game.

BBC - B £7.95

MINIATURE WARGAMES is the newest games magazine on the market. Issue 3 out now. The magazine is supported by some of the leading personalities in wargaming and has serious articles on all aspects of the hobby.

75p per issue. Half-year subscription **£6.00**. Year subscription **£12.00** (Including p&p).

RED SHIFT TRADING COMPANY

Software, boardgames, role-playing games, wargames and miniatures — the work of the best British and American games designers. Current projects: Campaign and battle computer simulations and strategy software. If you are working in the field of thinking games CONTACT US. We will pay royalties on completed games or will commission you to program to our designer's specifications. Phone or write for our complete games list.

RED SHIFT — opposite the Stoke Newington railway station. Cheques to Red Shift Ltd., Dept A, 12C Manor Road, London N16 5SA.

BUFFER MICRO LTD

310 STREATHAM HIGH ROAD, LONDON SW16 6HG
Tel: 01-769 2887

Open Tuesday—Saturday 10.30 am to 5.30 pm (Closed Mondays)

SOFTWARE FROM ALL THE BEST SUPPLIERS
— OVER THE COUNTER — PLUS GROWING
RANGE OF PERIPHERALS. SEE IT BEFORE
YOU BUY IT.

SAE appreciated for catalogue — but please specify
for which computer.

DRAGON ZX81 ZX SPECTRUM

THE WORLDS GREATEST RANGE OF SINCLAIR SOFTWARE

SOFTWARE DEMONSTRATIONS EVERY DAY

BBC-ACORN KEYBOARDS
ADD-ONS CASSETTES
BOOKS **VIC20**

*NEW! — BUFFER CLUB for regular customers.
Special Offers — Lectures — Foreign Trips —
Software Promotions. Ask for details of mem-
bership on your next visit.*

MEMBER OF THE COMPUTER TRADE ASSOCIATION — YOUR FAIR DEAL
GUARANTEE

VISA — ACCESS — AMERICAN EXPRESS — DINERS CLUB CARDS
WELCOME



Centronics Interface

The Centronics Interface consists of a cable and software on cassette which will allow a centronics style parallel printer to be used with the VIC-20. **£29.00** plus VAT

RS232 Interface

The RS232 Interface is a device which fits onto the VIC's user port and can be connected to an RS232 serial device, such as a printer, using a cable. **£29.00** plus VAT

IEEE-488 Interface

A cartridge to allow your VIC-20 to use Commodore disc drives, printers or other devices which use the Commodore IEEE-488 standard. **£39.00** plus VAT

STACK 290/298 Derby Road,
Bootle, Merseyside L20 8LN.
Tel: Sales **051-933 5511**
Service **051-933 3355**
Telex: **627026** (Stack-G)
Computer Services Limited

TECHNEG CLWYD TECHNICS LTD



Seikosha GP 80 **£170 Carr. £5**

BBC Micro Model 'A' **£261.30 Carr. £3**
BBC Micro Model 'B' **£348.26 Carr. £3**
BBC 16K RAM Upgrade **£25 + p&p £1**
BBC Printer Interface **£10 + p&p £1**
Acorn System 3 with 32K
Memory **£1,400 Carr. £10**
Zenith Z100 16 bit
System **from £2.072 Carr. £12**

ALL PRICES EXCLUDE VAT

We are the Acorn Econet specialist. Let us quote you for
your system.
Education discounts available.

Coach House, Kelsterton Road, Flint, Clwyd.
Tel: **DEESIDE 810518**

Let's face it — the sound from your Dragon 32
wouldn't win any prizes at an Eisteddfod. What you
need is a:-

Dragon 32 SOUND EXTENSION MODULE

- Fully-cased module plugs into cartridge port
- Provides 3 channels of sound: 3-note chords and harmonies over 5 octaves
- Uses new BASIC command. No need to 'Peek' or 'Poke'
- Many built-in sound effects (e.g. bomb, laser)
- Music and graphics can occur together without loss of speed
- Based on popular, well-proven sound generator
- Two Input/output ports included
- User manual provided, with examples



Cheque/P.O. to

J.C.B. (MICROSYSTEMS)
29 SOUTHBOURNE ROAD
BOURNEMOUTH BH6 5AE
Tel: (0202) 423973

ONLY
£34.95
inclusive

Write or phone for further details

NEXT MONTH

Our featured machine in the September issue of *Personal Computing Today* is the COMX 35. This machine follows the trend towards more powerful, lower priced computers. Priced at £149.95 including VAT, the COMX packs quite a punch.

The COMX is based around the 1802A processor which apparently found its way into a lot of NASA projects, including the Space Shuttle. The BASIC is contained in a 16K ROM. Expansion memory is available up to 67K.

COMX has a joystick built into it. Full colour and sound are also provided.

So does the COMX stand up to its rivals? You'll have to buy the September issue of *Personal Computing Today* to find out.

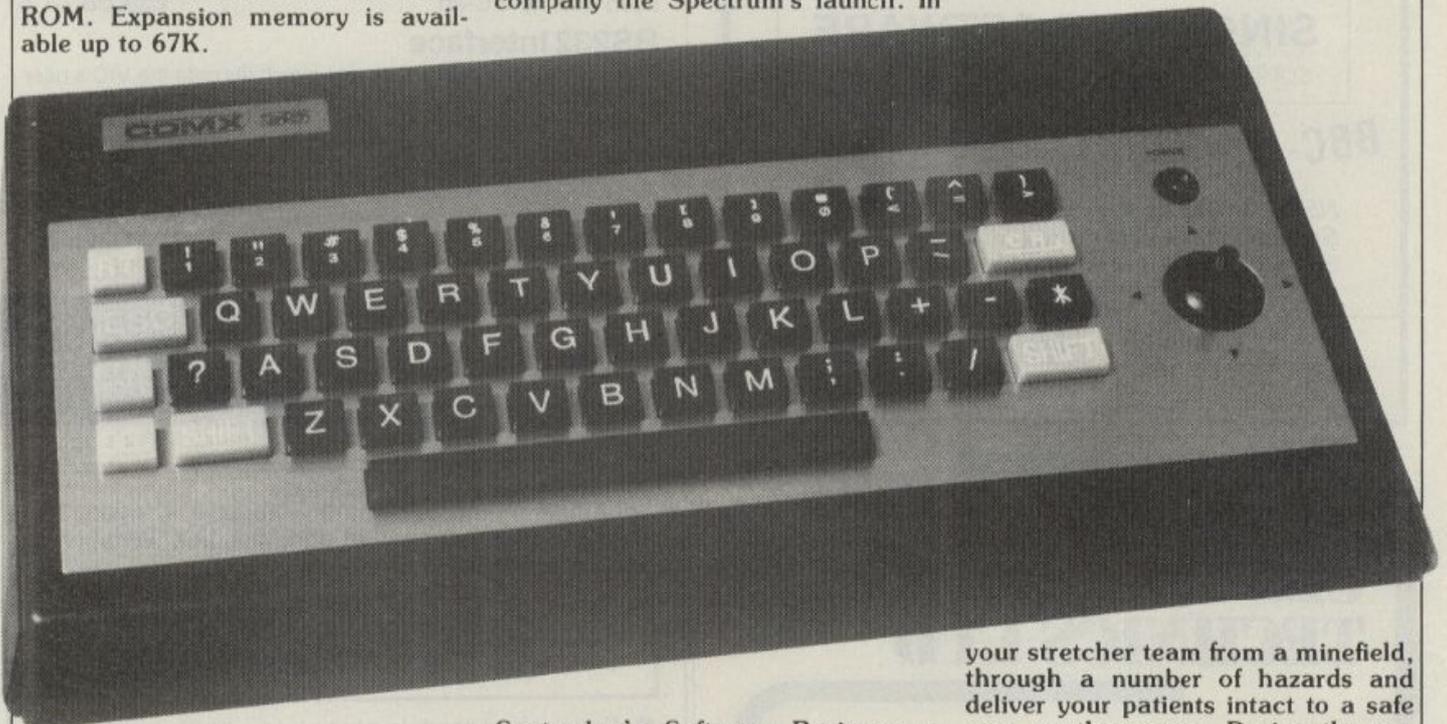
Software Reviews Business Focus

Psion software made their name by providing a lot of software to accompany the Spectrum's launch. In

found on any professional or business micro. VU-CALC is a spreadsheet program which will allow you to analyse tables and reports and explore 'what if' situations.

Piles of Programs

Among the programs for you to type in to your computer is a rather novel Spectrum program called Bomb Run. In it you have to steer



Unlike many computers in this price range the COMX sports a full size keyboard with 55 moving keys. Another interesting feature is that the

September's Software Reviews we take a look at two of their latest releases, this time for the increasingly popular BBC Micro. They have taken VU-FILE and VU-CALC from their Spectrum range and converted them to run on any 32K BBC computer.

These two products are aimed at the more serious micro user. VU-FILE is an information retrieval system and can be used to compile and access all sorts of files, lists and data bases. VU-CALC represents one of the most useful packages to be

your stretcher team from a minefield, through a number of hazards and deliver your patients intact to a safe area on the screen. During the run you have to cope with a steady rain of bombs and the occasional 'flitter'. So get your armbands on and join the battle.

All our regular features are around including the Software Checklist where you can browse for software in the comfort of your own home. The Factfile will tell you all you need to know about the top computers currently available.

Don't miss out, place an order for the September issue now.

Personal Computing Today
COMING NEXT MONTH
ON SALE FROM
AUGUST 5

GIVE THIS TO YOUR NEWSAGENT

Please reserve me a regular copy of
Personal Computing Today

Name

Address

.....

SPECTRUM 48K : ZX81 16K SIX PART ADVENTURE



BLACK CRYSTAL THE QUEST IS ABOUT TO BEGIN

The ultimate role-playing adventure for the SPECTRUM/ZX81. You can become a warrior, elf or wizard on a quest to find and use the rings of creation: to destroy the Black Crystal and defeat the Lords of Chaos. Held within six programs lies a land of fabulous treasures and mythical monsters. Journey through the land of Beroth, explore the castle of shadows, descend into the Shaggoths lair, search for diamonds in the sea of sand but beware of sand sharks! Confront the fire demon in his temple, battle against the Lords of Chaos and win your way to the Black Crystal.

By splitting Black Crystal into six programs we can provide more variety and detail than any other adventure for the Sinclair computers.

Real time monster battles. Superb graphics. Save game feature. All six parts are supplied together on cassette, boxed with instruction booklet.

**SPECTRUM 48K: 180K OF PROGRAM
IN SIX PARTS — ONLY £7.50**
**ZX81 16K: OVER 100K OF PROGRAM
IN SEVEN PARTS — ONLY £7.50**
**WHY PAY MORE FOR LESS OF AN
ADVENTURE**



To: CARNELL SOFTWARE, DEPT 2, 4 STAUNTON RD, SLOUGH, SL2 1NT.
Please send me: Black Crystal for my,

- Spectrum 48K..... £7.50
 ZX81 16K..... £7.50

I enclose a cheque/postal order (payable to Carnell Software) for £.....

NAME.....

ADDRESS.....

TRADE ENQUIRIES WELCOME

IT'S ANOTHER CLEVER IDEA FROM STACK

AND SO ECONOMICAL!

THE EXTRA CARTRIDGE SOCKET AND ROM SOCKET MAKE IT VERY VERSATILE!!!

IT'S GREAT! I CAN ADD EXTRA MEMORY USING MY POCKET MONEY

Have YOU got your STACK STOREBOARD yet?

Expand your VIC-20 memory from a youthful 5k to a mature 32k. Supplied with 8k fitted, the STOREBOARD allows you to build up the size of your VIC-20's memory, whenever you NEED more memory or, whenever you can AFFORD it! This means you get a FLEXIBLE system that SAVES YOU MONEY!!!

Compare these prices* ...

Stack 5k Storeboard.....	49.00	Commodore 16k Cartridge.....	65.17
1st 8k Ram Pack.....	21.00	8k Cartridge.....	39.09
2nd 8k Ram Pack.....	21.00	3k Cartridge.....	26.04
4k Ram Pack.....	11.00	4 slot Motherboard.....	29.00
27k Expansion.....	102.00	27k Expansion.....	159.30
TOTAL SAVING	57.30		

*Upgrading your STOREBOARD is easy! Simply remove the detachable cover and swap in the chips provided with Stack's 8k or 4k RAM PACKS.

•ADDED FEATURE! A socket is provided on Storeboards to allow you to use EPROMS or ROMS in addition to your extra memory. Once again you can save \$\$\$'s by using VIC-20 utility roms on your Storeboard instead of the more expensive cartridges.

*Prices exclude Value Added Tax and are correct at the time of going to press.

STACK

290/298 Derby Road,
Boole, Merseyside L20 8LN.
Tel: Sales 051-933 5511
Service 051-933 3355
Telex: 627026 (Stack-G)

Computer Services Limited

MAD MARTHA

For 48K SPECTRUM

GRAPHIC ADVENTURE

from
MIKRO-GEN



Poor little Henry is the hen-pecked hero of this domestic tale.

One night Henry can take no more. He steals his wages from his wife's purse, sneaks out of the house being careful not to wake the baby or trip over the cat, and heads for the bright lights to have some fun. Trouble is he runs out of money. His only way to raise some cash is to gamble his few remaining pounds on the spinning wheel of the roulette table.

Just as Henry is getting into his evening at the tables his wife — Mad Martha — has noticed his absence. Realising Henry has absconded with the housekeeping she sets out after him with an axe.

Guess what part you play in this happy tale? That's right, you're Henry. Watch out for that axe!

- * Accepts full English sentences *
- * Draws each location in hi-res *
- * Save game feature *
- * Hundreds of witty replies *
- * Includes three arcade type games *
* as part of the adventure *
- * Accepts multi-line commands *
- * Three skill levels *



Access or
Visa Card holders
telephone
(0344) 27317 (9am-6pm)



Mad Martha £6.95 plus 40p per order for post & packing

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

MIKROGEN, Dept PCT 24 Agar Crescent, Bracknell, Berkshire, RG12 2BK

XENO II

An E-XPANDED-D screen presentation with superb action packed space thriller, written entirely in machine code with four action packed stages. To destroy the power source of Xeno II, you have to fight off waves of robot attack, plasma bombing by the legions of the outer sanctum and finally attack the power source protected by a force field, continuous bombardment by guardians and blockading by wild whirling suicidal space ships. Truly a game for all arcadians.

JS VIC 20 16K £7.90

CAVERN FIGHTER

All M/C version of SCRAMBLE. Lasers, bombs, continuous scoring and sound effects give all the thrills of arcade game. Pilot your space ship through the tortuous tunnels and caverns destroying enemy missile launchers, fuel dumps and airborne fire saucers. Four ships to complete mission. 10 skill levels.

KB/JS VIC 20 Unexp. £6

CRAWLER

All M/C version of Centipede. Homing spiders, mushroom laying fleas and multi-direction travel makes this game fast and furious, with 10 skill levels.

JS VIC 20 Unexp. £6

PHARAOH'S TOMB

Once you enter, the only way out is with the aid of a key which unlocks the mystery of the Pharaoh's tomb. Beware of the mantraps the ancient Egyptians so painstakingly built. One false move and you will meet the same fate as befell other tomb robbers over thousands of years. A multi-screen big graphical adventure with M/C movements.

KB VIC 20 16K £6.00

SEVEN PROGRAMS (VOL 1)

Hi-res games for the whole family. Board game Othello plus Bomber, Slalom, Bounce out, Lunar Docker, Memory and Snake.

KB VIC 20 Unexp. £6.00

SEVEN PROGRAMS (VOL 2)

Another Hi-res games pack for the family. Graphical Adventure, Goblins Gold, plus Dare Devil, Ghosts, Grand Prix, Breakout, Cobra and Minefield.

KB VIC 20 Unexp. £6.00

SOFTWARE WRITERS

We are looking for top class writers to join our growing software team. If you have written a quality game for VIC 20, SPECTRUM, DRAGON 32, ORIC 1 or COMMODORE 64, then contact us. We pay top royalties for accepted programmes.



24 HR. CREDIT CARD SALES HORLEY (02934) 6083



KRAZY KONG

An E-XPANDED-D screen, large graphics, rolling barrels, hammer, fireballs, lifts, handbags and umbrellas as you try to rescue the damsel Kong has abducted. Spectacular collapse of Kong's lair in the fourth screen. Uses all 21K of your expanded Vic for this 100% M/C thriller. Complete with high score table.

KB/JS VIC 20 16K £7.90

GALACTIC ABDUCTORS

NEW

A stunning action packed game which uses all of your TV screen for the superb large animated graphics. Giant Space Hawks whirl and weave in intricate patterns as they drop their deadly homing mines which will destroy your base on contact. While you are busy defending yourself, the Hawks will feed on your helpless population returning only their skulls. All M/C game complete with high score table that will blow your mind with its graphics and sound effects.

JS VIC 20 16K £7.90

FROGRUN

NEW

Popular arcade game. All machine code with brilliant colour graphics and sound effect. Features include snakes, crocodiles, lady frogs, turtles, cars, lorries and logs.

KB/JS VIC 20 Unexp. £6

KB/JS SPECTRUM 16K/48K £6

KB/JS COMMODORE 64 £6

DRACULA

Count Dracula is asleep somewhere in his castle. He rises at midnight and you must find him and drive a stake through his heart before he rises. A multi-screen graphic adventure.

KB VIC 20 3K £6

TINY TOT'S SEVEN

Super games pack for younger children with bright colour graphics and sound effects. Everybody's favourite Simon plus Super Snap, O's and X's, Word Jumble, Bomber, Duck Shoot and Mad Drivers.

KB VIC 20 Unexp. £6.00

3D TIME TREK

NEW

At last a 3D game for the VIC! Although badly wounded, you are determined to seek and destroy the marauding space pirates who have now dispersed around the galaxy in search of fresh prey. A brilliant Startrek game with a difference — spectacular 3D graphics and real arcade actions.

JS VIC 20 16K £6.00

TRADE ENQUIRIES WELCOME, GENEROUS DISCOUNT

PAYMENT BY CHEQUE, P.O., ACCESS/VISA

ANIROG SOFTWARE
26 BALCOMBE GARDENS
HORLEY, SURREY

ENQUIRIES: HORLEY (02934) 2007/6083

Level 9 Computing's
great **ADVENTURE** games;
"A MINOR MIRACLE OF PROGRAMMING"
- Popular Computing Weekly; are now
available for 32K (or bigger) versions
of 7 popular micros!

ATARI 400/800 **BBC**
COMMODORE 64 **LYNX**
NASCOM **SPECTRUM**
and now the **380Z** as well.

Naturally,
all programs
are in stock



4 SLOT MOTHERBOARD

**NOW FITS
STRAIGHT INTO
YOUR VIC20**

**USE UP TO 4 CARTRIDGES
AT THE SAME TIME!**

The 4 SLOT MOTHERBOARD fits into the cartridge port and allows you to leave four cartridges in place switching on and off as required. No more wear and tear on your valuable cartridges! And it's available at a sensible price too! **£29.00** plus VAT

PSST! Don't forget if its extra memory you need, the STOREBOARD is the most economical pack of all!

STACK
Computer Services Limited

290/298 Derby Road,
Bootle, Merseyside L20 8LN.
Tel: Sales **051-933 5511**
Service **051-933 3355**
Telex: **627026** (Stack-G)

Personal Computing Today August 1983

ATARI 400/800 BBC COMMODORE 64 LYNX NASCOM SPECTRUM 380Z

GIANT ADVENTURE GAMES

- 1) **COLOSSAL ADVENTURE:** The classic mainframe game "Adventure" with all the original treasures & creatures + 70 extra rooms.
- 2) **ADVENTURE QUEST:** Through forest, desert, mountains, caves, water, fire, moorland and swamp on an epic quest vs Tyranny.
- 3) **DUNGEON ADVENTURE:** The vast dungeons of the Demon Lord have survived His fall. Can you get to their treasures first?

Every Level 9 adventure has over 200 individually described locations and is packed with puzzles - a game can easily take months to complete. Only sophisticated compression techniques can squeeze so much in! Each game needs 32K and costs £9.90

● **BBC FORTH, FORTH TOOLKIT**

- "r q FORTH" runs on 16K or 32K BBC micros and costs £15. It:
- ★ follows the FORTH-79 STANDARD and has fig-FORTH facilities;
 - ★ provides 260 FORTH words;
 - ★ is infinitely extensible;
 - ★ has a full-screen editor;
 - ★ allows full use of the M.O.S.;
 - ★ permits use of all graphic modes, even 0-2 (just!);
 - ★ provides recursion easily;
 - ★ runs faster than BBC BASIC;
 - ★ needs no added hardware;
 - ★ includes a 70 page technical manual and a summary card;
 - ★ has hundreds of users.
- Level 9 Computing are pleased to announce a new toolkit for "r q FORTH" on 32K BBC micros. It costs only £10 and adds the following facilities to FORTH:
- ★ a 6502 assembler, providing machine-code within FORTH;
 - ★ turtle graphics, giving you easy-to-use colour graphics;
 - ★ decompiler routines, allowing the versatile examination of your compiled FORTH Programs;
 - ★ the full double-number set;
 - ★ an example FORTH program and demonstrations of graphics;
 - ★ other useful routines.

● **NASCOM**

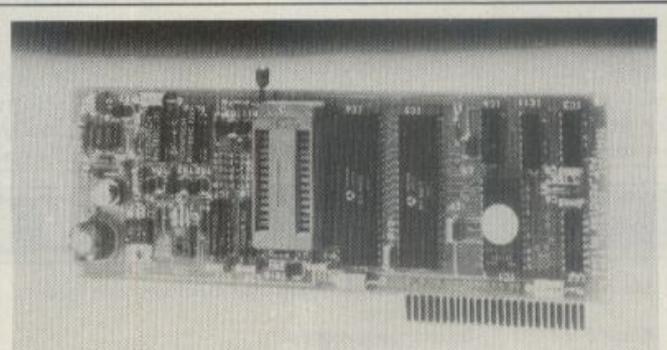
Extension Basic £15/£30 ROM
Adds 30 new keywords to BASIC
Compression Assembler 2 £12
Small Source + high speed

Asteroids m/c,g £7.90
Galaxy Invaders m/c,g £5.90
Missile Defence m/c,g £7.90
Super Gulp eb,g £4.90
5-games cassette misc £5.90
(FULL RANGE IN CATALOGUE)

ALL PRICES INCLUDE P & P AND VAT. All programs are in stock and will be sent within 2 days of receipt. Please send order or SAE for catalogue, describing your micro, to:

LEVEL 9 COMPUTING

Dept C, 229 Hughenden Road, High Wycombe, Bucks. HP13 5PG



Try the Apple Cards from Namal!

Pictured above is the new Romblo 1248, an EPROM blower for the Apple Microcomputer. It will programme all 25 and 27 series EPROMS and has its own on-board software, so that it does not require expensive disk drives and it speeds up operation.

There are three more Apple Cards which will be available soon, all offering excellent features at an attractive price. Phone or write for details!

P.S. We now have a shop in Royston, Cambridgeshire, with a wide range of hardware and software - Sinclair, Dragon, Commodore.... The shop is in John Street, Royston, Telephone (0763) 42622.

NAMAL ASSOCIATES LIMITED

The Gatehouse, 25 Gwydir Street, Cambridge CB1 2LG
Telephone (0223) 355404 Telex 817445

GRAND PRIX 64

Put the pedal to the metal in C. R. Wright's fast and furious '64 program.

64 Grandprix is really a very souped-up version of the simple game that beginners wrote when PETs and Superboards were the most popular computers. Inevitably, times have changed and the Commodore 64 is somewhat more advanced than those, now outdated, computers!

This program, therefore, takes advantage of the better features of the machine like user-defined graphics, colour sound effects etc. . . to give you an addictive, fast moving game for the player with a sharp eye.

The program itself, i.e. the BASIC part, takes 5.3K of memory but you will find that after running the program you seem to be only left with 4½K. This is because that

memory is reserved for user-defined graphics. Not all of that space is needed but you shouldn't need to use any other programs at the same time as Grandprix I hope.

The idea of the game is to get as far into the racetrack as possible. Instructions are in the program and there are 9 levels of play, level 9 being the hardest. More points are gained on higher levels, so that all the scores are scaled up or down so as to make it fair on those who have a harder game.

My hi-score is 8478 on level 9! But this was only after 3¼ hours non-stop attempts!! Do not despair if you only find yourself getting a score of 432 or something as this

was my average score to start with. If you get the hi-score a tone will be heard before it is printed.

The listing is quite straight forward, but remember to type 'shift' spaces where indicated otherwise there will be a bug in the program and it will not run effectively. Good luck anyway and do write to us if you beat 8478!

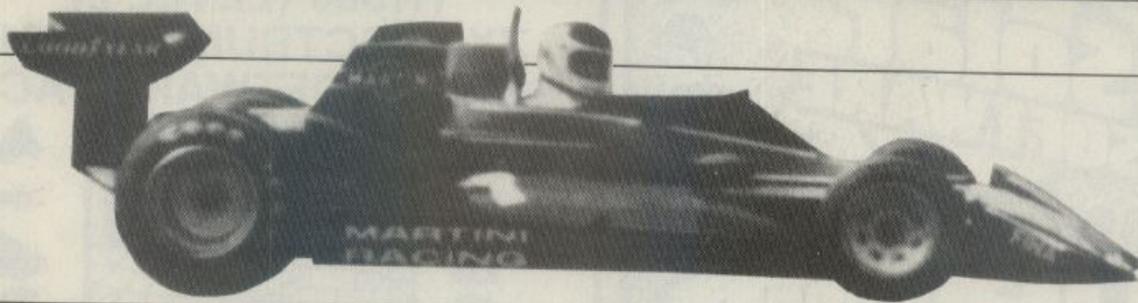
Those of you who are getting frustrated by the 64's lack of commands covering sound and graphics will be pleased to hear that C.W. Wright has also written a package called BC BASIC which provides a lot of extra commands to enable you to handle sound, graphics and colour easily. He is hoping to market it so watch out in the reviews section for further details.

HOW IT RUNS

Lines 2-3	Set up screen, jump into machine code loader, more set-up	Lines 308-320	Increment score, read keyboard, react and return to beginning of main program loop at 250.
Lines 5-9	Instructions request	Lines 500-740	Game over routine, print scores, hi-score, repeat?
Lines 10-13	Set-up sound variables and clear score	Lines 1000-1180	Instructions routine
Lines 20-25	Print up coloured Grandprix 4 times	Lines 2000-2070	Machine code loader routine
Lines 30-80	Grandprix sign subroutine	Lines 3000-3060	User-defined graphics m/c loader data
Lines 90-190	Initial graphics routine	Lines 3080-3130	User-defined graphics data
Lines 200-216	Select level 1-9 and calculate scale factors etc. . .	Line 4000	Click: sound subroutine
Lines 217-240	Set-up track variables and start game	Line 4100	Hi-click: sound subroutine
Lines 250-302	Display car and track with obstacles at random	Lines 4200-4220	Explode: sound soubroutine
Lines 305-306	Check for crash, if not re-display car and delay	Lines 4300-4320	Fading tone: sound subroutine
		Lines 4500-4610	Level of play mathematical conversions

VARIABLES USED

HS	High score	S	Score or number of postions moved
A\$	General purpose input	LN	Low frequency POKE address
SN	Start address of SID chip	VL	Volume POKE address
HN	High frequency POKE address	AD	Attack/decay POKE address
WV	Waveform POKE address	I	General purpose loops/delays
CL\$ (1-4)	Colour variables	A	Used for keyboard input values
K	Same as I	PC	Character screen POKE address
L	Same as A & delay time	TA	Tabulation Value of track
PL	Colour screen POKE address	F,E and T	Tabulate variables
D	Random number generator	LE	Scaling-up factor of score
Z	Delay variable	E	Also used to load machine code
TR\$ (1-17)	Track variables	Q	Used for volume decay in 'explode' and 'fading tone' routines



HINTS ON CONVERSION

It shouldn't be too hard to convert this game to another machine but watch out for colour pokes if your machine is mono. The 64 screen locations are from 1024 to 2023 and the colour locations for each square at 55296 to 56295. A list of variables is printed below which makes it easier to convert. POKE53280,6 and POKE53281,9 in line 2 set the border to blue and the screen to brown (black is probably better for machines like the Spectrum of BBC). POKE646,15 sets the ink colour. GETA\$ in line 6 is like INKEY\$. In line 160 MID\$ is the character in MS\$ at position K. PEEK(197) is the keyboard scan and can be replaced by INKEY\$ again. The shifted spaces in lines 217-219 are to stop the car

leaving the track, they are probably best replaced by double width track borders instead. The POKE808,239 in line 2070 and POKE 808,237 in line 740 are to disable and re-enable the break or run/stop key. The machine code is the hardest to convert unless you have an assembler. It is in standard 6502 assembly language and it copies the character ROM into RAM and a few other POKES to decide where to situate it. If you have a machine like a Spectrum, Oric, BBC or whatever, it is probably quicker to use the already existing user defined graphics facilities from BASIC. Good luck!!

PROGRAM LISTING

```

0 REM-GRANDPRIX BY C.R.WRIGHT
1 REM
2 POKE53280,6:POKE53281,9:POKE646,15:GOTO2000
3 PRINTCHR$(0);HS=0:DIR$(17)
4 PRINT"##### YOU REQUIRE INSTRUCTIONS (Y OR N)?"
5 GETA:IFA=""THEN1
6 IFA="Y"THEN100
7 IFA="N"THEN10
8 IFA="?"THEN1000
9 GOTO6
10 PRINT"Q: C=0
12 SH=54272:LN=31:MH=SH+1:VL=LN+24:VY=SH+4:AD=SH+5
13 REM-INITIAL SETUP AND BEGIN START LOGO
14 CLC(1)="M":CLC(2)="D":CLC(3)="T":CLC(4)="S"
15 FORI=1704:PRINTCL4(I):GOSUB200:PRINTNEXT:GOTO500
16 PRINT"
17 PRINT"
18 PRINT"
19 PRINT"
20 PRINT"
21 PRINT"
22 PRINT"
23 PRINT"
24 PRINT"
25 PRINT"
26 PRINT"
27 PRINT"
28 PRINT"
29 PRINT"
30 RETURN
31 PRINT"#####
32 PRINT"#####
33 PRINT"#####
34 PRINT"#####
35 PRINT"#####
36 PRINT"#####
37 PRINT"#####
38 PRINT"#####
39 PRINT"#####
40 PRINT"#####
41 PRINT"#####
42 PRINT"#####
43 PRINT"#####
44 PRINT"#####
45 PRINT"#####
46 PRINT"#####
47 PRINT"#####
48 PRINT"#####
49 PRINT"#####
50 PRINT"#####
51 PRINT"#####
52 PRINT"#####
53 PRINT"#####
54 PRINT"#####
55 PRINT"#####
56 PRINT"#####
57 PRINT"#####
58 PRINT"#####
59 PRINT"#####
60 PRINT"#####
61 PRINT"#####
62 PRINT"#####
63 PRINT"#####
64 PRINT"#####
65 PRINT"#####
66 PRINT"#####
67 PRINT"#####
68 PRINT"#####
69 PRINT"#####
70 PRINT"#####
71 PRINT"#####
72 PRINT"#####
73 PRINT"#####
74 PRINT"#####
75 PRINT"#####
76 PRINT"#####
77 PRINT"#####
78 PRINT"#####
79 PRINT"#####
80 PRINT"#####
81 PRINT"#####
82 PRINT"#####
83 PRINT"#####
84 PRINT"#####
85 PRINT"#####
86 PRINT"#####
87 PRINT"#####
88 PRINT"#####
89 PRINT"#####
90 PRINT"#####
91 PRINT"#####
92 PRINT"#####
93 PRINT"#####
94 PRINT"#####
95 PRINT"#####
96 PRINT"#####
97 PRINT"#####
98 PRINT"#####
99 PRINT"#####
100 PRINT"#####
101 PRINT"#####
102 PRINT"#####
103 PRINT"#####
104 PRINT"#####
105 PRINT"#####
106 PRINT"#####
107 PRINT"#####
108 PRINT"#####
109 PRINT"#####
110 PRINT"#####
111 PRINT"#####
112 PRINT"#####
113 PRINT"#####
114 PRINT"#####
115 PRINT"#####
116 PRINT"#####
117 PRINT"#####
118 PRINT"#####
119 PRINT"#####
120 PRINT"#####
121 PRINT"#####
122 PRINT"#####
123 PRINT"#####
124 PRINT"#####
125 PRINT"#####
126 PRINT"#####
127 PRINT"#####
128 PRINT"#####
129 PRINT"#####
130 PRINT"#####
131 PRINT"#####
132 PRINT"#####
133 PRINT"#####
134 PRINT"#####
135 PRINT"#####
136 PRINT"#####
137 PRINT"#####
138 PRINT"#####
139 PRINT"#####
140 PRINT"#####
141 PRINT"#####
142 PRINT"#####
143 PRINT"#####
144 PRINT"#####
145 PRINT"#####
146 PRINT"#####
147 PRINT"#####
148 PRINT"#####
149 PRINT"#####
150 PRINT"#####
151 PRINT"#####
152 PRINT"#####
153 PRINT"#####
154 PRINT"#####
155 PRINT"#####
156 PRINT"#####
157 PRINT"#####
158 PRINT"#####
159 PRINT"#####
160 PRINT"#####
161 PRINT"#####
162 PRINT"#####
163 PRINT"#####
164 PRINT"#####
165 PRINT"#####
166 PRINT"#####
167 PRINT"#####
168 PRINT"#####
169 PRINT"#####
170 PRINT"#####
171 PRINT"#####
172 PRINT"#####
173 PRINT"#####
174 PRINT"#####
175 PRINT"#####
176 PRINT"#####
177 PRINT"#####
178 PRINT"#####
179 PRINT"#####
180 PRINT"#####
181 PRINT"#####
182 PRINT"#####
183 PRINT"#####
184 PRINT"#####
185 PRINT"#####
186 PRINT"#####
187 PRINT"#####
188 PRINT"#####
189 PRINT"#####
190 PRINT"#####
191 PRINT"#####
192 PRINT"#####
193 PRINT"#####
194 PRINT"#####
195 PRINT"#####
196 PRINT"#####
197 PRINT"#####
198 PRINT"#####
199 PRINT"#####
200 PRINT"#####
201 PRINT"#####
202 PRINT"#####
203 PRINT"#####
204 PRINT"#####
205 PRINT"#####
206 PRINT"#####
207 PRINT"#####
208 PRINT"#####
209 PRINT"#####
210 PRINT"#####
211 PRINT"#####
212 PRINT"#####
213 PRINT"#####
214 PRINT"#####
215 PRINT"#####
216 PRINT"#####
217 PRINT"#####
218 PRINT"#####
219 PRINT"#####
220 PRINT"#####
221 PRINT"#####
222 PRINT"#####
223 PRINT"#####
224 PRINT"#####
225 PRINT"#####
226 PRINT"#####
227 PRINT"#####
228 PRINT"#####
229 PRINT"#####
230 PRINT"#####
231 PRINT"#####
232 PRINT"#####
233 PRINT"#####
234 PRINT"#####
235 PRINT"#####
236 PRINT"#####
237 PRINT"#####
238 PRINT"#####
239 PRINT"#####
240 PRINT"#####
241 PRINT"#####
242 PRINT"#####
243 PRINT"#####
244 PRINT"#####
245 PRINT"#####
246 PRINT"#####
247 PRINT"#####
248 PRINT"#####
249 PRINT"#####
250 PRINT"#####
251 PRINT"#####
252 PRINT"#####
253 PRINT"#####
254 PRINT"#####
255 PRINT"#####
256 PRINT"#####
257 PRINT"#####
258 PRINT"#####
259 PRINT"#####
260 PRINT"#####
261 PRINT"#####
262 PRINT"#####
263 PRINT"#####
264 PRINT"#####
265 PRINT"#####
266 PRINT"#####
267 PRINT"#####
268 PRINT"#####
269 PRINT"#####
270 PRINT"#####
271 PRINT"#####
272 PRINT"#####
273 PRINT"#####
274 PRINT"#####
275 PRINT"#####
276 PRINT"#####
277 PRINT"#####
278 PRINT"#####
279 PRINT"#####
280 PRINT"#####
281 PRINT"#####
282 PRINT"#####
283 PRINT"#####
284 PRINT"#####
285 PRINT"#####
286 PRINT"#####
287 PRINT"#####
288 PRINT"#####
289 PRINT"#####
290 PRINT"#####
291 PRINT"#####
292 PRINT"#####
293 PRINT"#####
294 PRINT"#####
295 PRINT"#####
296 PRINT"#####
297 PRINT"#####
298 PRINT"#####
299 PRINT"#####
300 PRINT"#####
301 PRINT"#####
302 PRINT"#####
303 PRINT"#####
304 PRINT"#####
305 PRINT"#####
306 PRINT"#####
307 PRINT"#####
308 PRINT"#####
309 PRINT"#####
310 PRINT"#####
311 PRINT"#####
312 PRINT"#####
313 PRINT"#####
314 PRINT"#####
315 PRINT"#####
316 PRINT"#####
317 PRINT"#####
318 PRINT"#####
319 PRINT"#####
320 PRINT"#####
321 PRINT"#####
322 PRINT"#####
323 PRINT"#####
324 PRINT"#####
325 PRINT"#####
326 PRINT"#####
327 PRINT"#####
328 PRINT"#####
329 PRINT"#####
330 PRINT"#####
331 PRINT"#####
332 PRINT"#####
333 PRINT"#####
334 PRINT"#####
335 PRINT"#####
336 PRINT"#####
337 PRINT"#####
338 PRINT"#####
339 PRINT"#####
340 PRINT"#####
341 PRINT"#####
342 PRINT"#####
343 PRINT"#####
344 PRINT"#####
345 PRINT"#####
346 PRINT"#####
347 PRINT"#####
348 PRINT"#####
349 PRINT"#####
350 PRINT"#####
351 PRINT"#####
352 PRINT"#####
353 PRINT"#####
354 PRINT"#####
355 PRINT"#####
356 PRINT"#####
357 PRINT"#####
358 PRINT"#####
359 PRINT"#####
360 PRINT"#####
361 PRINT"#####
362 PRINT"#####
363 PRINT"#####
364 PRINT"#####
365 PRINT"#####
366 PRINT"#####
367 PRINT"#####
368 PRINT"#####
369 PRINT"#####
370 PRINT"#####
371 PRINT"#####
372 PRINT"#####
373 PRINT"#####
374 PRINT"#####
375 PRINT"#####
376 PRINT"#####
377 PRINT"#####
378 PRINT"#####
379 PRINT"#####
380 PRINT"#####
381 PRINT"#####
382 PRINT"#####
383 PRINT"#####
384 PRINT"#####
385 PRINT"#####
386 PRINT"#####
387 PRINT"#####
388 PRINT"#####
389 PRINT"#####
390 PRINT"#####
391 PRINT"#####
392 PRINT"#####
393 PRINT"#####
394 PRINT"#####
395 PRINT"#####
396 PRINT"#####
397 PRINT"#####
398 PRINT"#####
399 PRINT"#####
400 PRINT"#####
401 PRINT"#####
402 PRINT"#####
403 PRINT"#####
404 PRINT"#####
405 PRINT"#####
406 PRINT"#####
407 PRINT"#####
408 PRINT"#####
409 PRINT"#####
410 PRINT"#####
411 PRINT"#####
412 PRINT"#####
413 PRINT"#####
414 PRINT"#####
415 PRINT"#####
416 PRINT"#####
417 PRINT"#####
418 PRINT"#####
419 PRINT"#####
420 PRINT"#####
421 PRINT"#####
422 PRINT"#####
423 PRINT"#####
424 PRINT"#####
425 PRINT"#####
426 PRINT"#####
427 PRINT"#####
428 PRINT"#####
429 PRINT"#####
430 PRINT"#####
431 PRINT"#####
432 PRINT"#####
433 PRINT"#####
434 PRINT"#####
435 PRINT"#####
436 PRINT"#####
437 PRINT"#####
438 PRINT"#####
439 PRINT"#####
440 PRINT"#####
441 PRINT"#####
442 PRINT"#####
443 PRINT"#####
444 PRINT"#####
445 PRINT"#####
446 PRINT"#####
447 PRINT"#####
448 PRINT"#####
449 PRINT"#####
450 PRINT"#####
451 PRINT"#####
452 PRINT"#####
453 PRINT"#####
454 PRINT"#####
455 PRINT"#####
456 PRINT"#####
457 PRINT"#####
458 PRINT"#####
459 PRINT"#####
460 PRINT"#####
461 PRINT"#####
462 PRINT"#####
463 PRINT"#####
464 PRINT"#####
465 PRINT"#####
466 PRINT"#####
467 PRINT"#####
468 PRINT"#####
469 PRINT"#####
470 PRINT"#####
471 PRINT"#####
472 PRINT"#####
473 PRINT"#####
474 PRINT"#####
475 PRINT"#####
476 PRINT"#####
477 PRINT"#####
478 PRINT"#####
479 PRINT"#####
480 PRINT"#####
481 PRINT"#####
482 PRINT"#####
483 PRINT"#####
484 PRINT"#####
485 PRINT"#####
486 PRINT"#####
487 PRINT"#####
488 PRINT"#####
489 PRINT"#####
490 PRINT"#####
491 PRINT"#####
492 PRINT"#####
493 PRINT"#####
494 PRINT"#####
495 PRINT"#####
496 PRINT"#####
497 PRINT"#####
498 PRINT"#####
499 PRINT"#####
500 PRINT"#####

```

```

510 IFA=6:THENFOKFL,14
520 FORZ=1705:NEXT:NEXT:GOSUB4200
530 PRINT"#####
540 PRINT"#####
550 LE=ABS(LE-10):S=4*LE:PRINT"#####
560 IFSCHTHEN700
570 IFS=H:THEN500
580 PRINT"#####
590 PRINT"#####
600 PRINT"#####
610 PRINT"#####
620 PRINT"#####
630 PRINT"#####
640 PRINT"#####
650 PRINT"#####
660 PRINT"#####
670 PRINT"#####
680 PRINT"#####
690 PRINT"#####
700 PRINT"#####
710 PRINT"#####
720 A=PEEK(197):IFA=4:THEN20
730 IFA=4:THEN10
740 PRINT"#####
750 PRINT"#####
760 PRINT"#####
770 PRINT"#####
780 PRINT"#####
790 PRINT"#####
800 PRINT"#####
810 PRINT"#####
820 PRINT"#####
830 PRINT"#####
840 PRINT"#####
850 PRINT"#####
860 PRINT"#####
870 PRINT"#####
880 PRINT"#####
890 PRINT"#####
900 PRINT"#####
910 PRINT"#####
920 PRINT"#####
930 PRINT"#####
940 PRINT"#####
950 PRINT"#####
960 PRINT"#####
970 PRINT"#####
980 PRINT"#####
990 PRINT"#####
1000 PRINT"#####
1010 PRINT"#####
1020 PRINT"#####
1030 PRINT"#####
1040 PRINT"#####
1050 PRINT"#####
1060 PRINT"#####
1070 PRINT"#####
1080 PRINT"#####
1090 PRINT"#####
1100 PRINT"#####
1110 PRINT"#####
1120 PRINT"#####
1130 PRINT"#####
1140 PRINT"#####
1150 PRINT"#####
1160 PRINT"#####
1170 GETA:IFA=""THEN170
1180 GOTO15
1190 REM-INITIALIZE ROUTINE AND MACHINE CODE DATA
1200 PRINT"#####
1210 FORI=4215:TO4323:READN:POKE,I:RESTORE
1220 SYS49152:CLR:SYS49161
1230 FORI=4315:TO4323:READN:RESTORE
1240 FORI=1706:READN:FORJ=1700:READN:J:NEXT:G2=0
1250 FORK=12288+(8*INT(12288/8*INT)7:G2=021:POKE,I(G2):NEXT:HERTE
1260 POKE808,239:GOTO3
1270 DATA169,48,141,32,0,141,56,0,96,149,0,141,14,220,169,51,141,170,162,0,189
1280 DATA208,157,0,49,189,0,205,157,0,49,189,0,110,157,0,50,189,0,211,157,0
1290 DATA157,0,55,232,224,255,230,230,173,255,206,141,255,48,173,255,203,141
1300 DATA255,49,173,255,210,141,255,58,173,255,211,141,255,51,173,255
1310 DATA212,141,255,58,173,255,210,141,255,51,173,255,214,141,255,54,169,55
1320 DATA141,1,0,169,1,141,14,228,169,28,141,24,208,96
1330 REM-CHARACTER DATA
1340 DATA90,195,255,112,24,215,255,215,24
1350 DATA182,255,255,66,90,90,66,255,255
1360 DATA168,255,129,189,189,189,189,129,255
1370 DATA1,248,216,248,216,247,12,12,7
1380 DATA60,66,157,161,161,157,66,60
1390 DATA67,120,85,154,16,8,176,77,130
1400 REM-SOUND SUBROUTINES
1410 POKEVL,15:POKEV,32:POKEH,55:POKELN,55:POKEVL,0:RETURN
1420 POKEV,9:POKEV,129:POKEH,3:POKELN,0
1430 FORI=15:TO129:STEP,1:POKEVL,0:NEXT
1440 POKEV,129:POKEH,0:RETURN
1450 FORI=9:POKEV,17:POKEH,45:POKELN,55
1460 FORI=15:TO129:STEP,1:POKEVL,0:NEXT
1470 REM-LEVEL OF PLAY CONVERSION
1480 IFL=56:THENLE=1
1490 IFL=58:THENLE=2
1500 IFL=60:THENLE=3
1510 IFL=62:THENLE=4
1520 IFL=64:THENLE=5
1530 IFL=66:THENLE=6
1540 IFL=68:THENLE=7
1550 IFL=70:THENLE=8
1560 IFL=72:THENLE=9
1570 LE=ABS(LE-9)*14,5
1580 LE=ABS(LE-10)
1590 RETURN

```



This must be the most spectacular arcade action game, ever to be produced on cassette for the 8 or 16k expanded VIC 20.

As captain of a star ship lost in space, you encounter a miraculous force of winged creatures, known to the galaxy as the COSMIC FIRE BIRDS. They loop the loop. They figure of eight. They swoop. They dive, can YOU survive. Full screen display, 99 progressive levels of play, 5 lives, Bonus ship at 5,000 points, swarms, bombers, leaders, hawks.

This is arcade action like it's never been seen before. 100% M/C. Superb colour graphics and sound.

£9.95

P&P Inc.

Available mail order from
51 Meadowcroft, Radcliffe,
Manchester. M26 0JP
Tel: 061 724 8622

Also available from
Micro C Manchester, Micro North, Bury,
and soon all good computer shops.

Other games available for the unexpanded VIC.

Scrambler M/C	£5.00	Gun Fight M/C	£5.00
Munch Man M/C	£5.00	Super Breakout M/C	£5.00
Galaxions M/C	£5.00	Asteroyds M/C	£5.00
Cavern Raider M/C	£6.00		

**ALL ORDERS SENT BY RETURN POST
TRADE ENQUIRIES WELCOME**

TRS80 (LEVEL 2) ZX SPECTRUM — ZX81 SUPER SOFTWARE PACK



25 Great programmes on one pack: Star Wars, Gambling Machine, Break-out, Trap It, Population Simulation, Corridors of Doom, Housebreak, Towers of Hanoi, Butterfly Chase, The Vault, Yahtzee, Maths, Calendar, Amazing 3D Mazes, 3D Noughts & Crosses, Jackpot, Bandit, Hangman - Musical, Bible, History and Sport, Mastermind, Spelling, Diary, Records File and Time Warrior.

Here are descriptions of just a few of the games:

HOUSEBREAK You enter a house at night in an attempt to rob it of money and any gold and silver items you can find. Your object is to clean out the house. In the dark you must avoid bumping into the furniture. After an interval of time an alarm will sound and a short while later the lights will be turned on. A vicious dog is then released and you have to use all your skill and cunning to avoid getting bitten as he chases you around the house. Any injuries caused by the dog will slow down your escape. The game is played in real time, has excellent graphics and is very exciting. A new house is generated each time the game is played.

CORRIDORS OF DOOM! A dungeons & dragons type game that is very addictive. You can never win this game by chance. A lot depends on discovering the secrets of just how you have to deal with each individual monster in the game. There is a liquid which will destroy the Werewolf — but which one? How can you tame the giant spider? Will you ever learn the secret of how to defeat the Blood Devil? All of the monsters have treasures for those who are both brave and wise enough to overcome them, but to escape alive you must first cross some very nasty pits. Play it again and again.

AMAZING 3D MAZES Wander through the giant 18x18x18 mazes collecting treasures, you know where they are, but how do you get to them? Extra points are awarded for finding the shortest routes. Don't get too frustrated by apparent dead ends.

3D NOUGHTS & CROSSES Played inside a 4x4x4 cube, this is a game for the intellectual. Great graphics. It plays a mean game and wins about nine out of every ten games it plays.

TOWERS OF HANOI You will welcome this classical puzzle which is a must for anyone with a computer. The problems difficulty depends on how many disks you use. It might only take you a few minutes with four disks, but with all nine it could take all day. Two variations of the game are included. There is a constant display of Hours : Mins : Secs, so that you know how well or how badly you are doing at any particular stage. If you find you cannot work the problem out! The computer will show you the shortest possible solution.

THE VAULT A high security vault in Oxford. (The game can be changed to centre around your own home town) has ten doors, each with its own five figure combination. The combination of the nine inner doors are known, but only the manager knows the combination of the outer door. Unfortunately the manager has got himself locked in the Vault. It is your job to get him out before all the Oxygen is used up. The computer will give you metaphorical clues to how near you are getting. The time switches which change the combination every so often can prove a problem. This is a case which really puts your powers of logic to the test.

POPULATION SIMULATION This is a game for two players, each becoming the leader of one of the planets 'Techno' & 'Primo'. It is a battle to survive. Each decade a player must decide various things in governing his planet, he must carefully balance production and technology against consumption and population. He can either negotiate with his opponent or declare war on him. How about sending out an exploration party in search of new wealth. Only the experienced last very long.

TIME WARRIOR You are an experienced time warrior and you have been sent on a mission to rid the Universe of imposters who have taken up key positions in ten different time sectors. In this adventure you will face the gladiators in Ancient Rome, find yourself in a gun fight in Old America, help Hillary climb Everest, joust with the Black knight. It's all to be done in 'Time Warrior'.

The full cassette of 25 programmes is sent to you for only **£8.95** inclusive.

Please feel free to write or phone for details of other programmes.

Trade enquiries welcomed

Telephone John Wilson on 0608 3059

**SPARTAN SOFTWARE
(DEPT. PCT)**

9 Cotswold Terrace,
Chipping Norton,
Oxon.





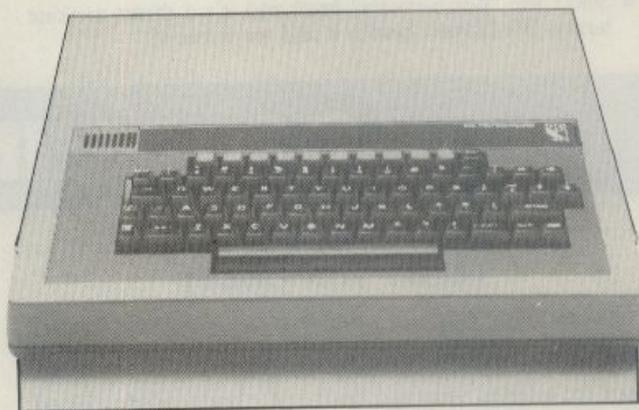
SIR COMPUTERS LTD CARDIFF

Agents for Acorn, BBC and TORCH Computers

BBC Microcomputers

Model B	£399.00
Model B with disc interface	£509.00
Disc interface	£110.00
Upgrade of BBC Model A to B	£90.00

Please telephone for up to date information on Prestel, Teletext, speech synthesis, second processors, etc.



TORCH Computers

Z-80 Disc Pack for the BBC Microcomputer **£897.00**
This unit connects to the BBC Micro in the same way as a normal disc drive, but as well as offering a dual 2 x 400K disc drive for use under BBC BASIC or other languages it provides the option of using the wide range of CP/M software available for business and data processing applications. The firmware supplied with the machine allows switching between BASIC and CPN, a powerful operating system developed from CP/M 2.2.

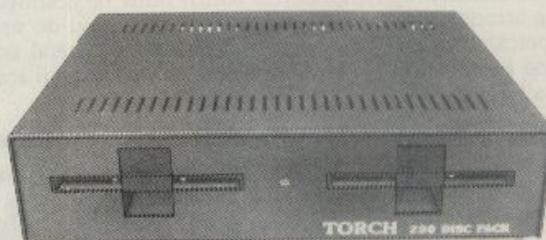
In addition to the disc pack a second processor is supplied. This is a Z-80A with its own 64K RAM card, communicating with the 6502A in the BBC computer through the 'Tube'. Typically the speed of execution of programs under the twin-processor system is increased by up to 50% compared with a conventional single-processor computer. A third processor, the 16 bit 68000, will shortly be available.

TORCH CF240 **£3200.00**
WORDSTAR WORD PROCESSOR SUPPLIED FREE OF CHARGE

This is an extension of the BBC microcomputer/Torch disc pack system, available in a single unit. The computer contains a BBC-based peripheral processor connected to the main Z-80 computer, a dual 2 x 400K disc drive as described above, a high resolution (80 character) colour monitor and a complete British Telecom approved 1200 baud modem. It is the only microcomputer which has been granted permission for direct connection to the Public Switched Telephone Network both in the U.K. and the United States.

The TORCH can communicate either directly with another TORCH or with virtually any other type of computer via Prestel or BT Gold. Using the Gateway facility of Prestel it is possible for the TORCH to access vast amounts of information stored by private organisations on public database systems. The Mailbox facility of Prestel also allows the use of electronic mail.

TORCH CH240/10 As above but with a 10 MB hard disc drive.
TORCH CH240/21 As above but with a 21 MB hard disc drive



PERIPHERALS

Seikosa GP 100A printer.....	£229.00
Shinwa CP-80 printer.....	£389.00
Epson FX-80 printer.....	£470.00
Juki 6100 daisywheel printer	Only £470.00
Sanyo high resolution black/green monitor	£95.00
Kaga Vision I colour monitor	£299.00
Microvitec colour monitor	£310.00
LVL/Acorn disc drives	
100K	£265.00
2 x 100K	£389.00
TEAC disc drives	
100K	£249.00
2 x 100K	£399.00
2 x 400K	£712.00

SOFTWARE

We currently hold in stock software from over twenty different software houses. We are always extending the range of programs offered — please telephone for details of our current range.

Delivery by Interlink of any hardware item **£10.00**

ALL PRICES ARE INCLUSIVE OF VAT

SIR COMPUTERS LTD
91 WHITCHURCH ROAD, CARDIFF
TELEPHONE (0222) 21341



SPECTRUM

16/48

ZX81

16K

AWARI

- ★ The ancient African game of logic. It takes 2 minutes to learn the rules but far longer to master the tactics.
- ★ Select the 'Goat-herd' level of play and it's an addictive game for children (8+) that exercises their minds - not their laser fingers.
- ★ Select the 'Witch-doctor' level and it's a threat to your sanity. We haven't beaten it and we wrote it!

ADVENTURE

- ★ Over 200 places to explore in this machine code game using advanced data compression techniques.
- ★ No random elements - you will need skill, cunning and a sense of humour as you explore caves, forest and castles.
- ★ Evade ruthless pursuers and overcome a host of obstacles.
- ★ Multiple word commands and single letter abbreviations!

£1000 IN PRIZES

FANTASTIC VOYAGE (ZX81 16K ONLY)

This real-time graphics simulation set inside the human body was written by a lecturer in anatomy. You are injected into the blood stream in your miniature submarine. Navigate the arteries, veins and heart to the brain, where a blood clot must be destroyed. Features a real vascular map. You will be attacked by lymphocytes which must be destroyed using arcade game type graphics. Everything you do uses up precious energy. Three display formats - a lateral and frontal body scan plus blood vessel name, a close-up scan and a laser-sight for fighting lymphocytes.

★★ Buy both Awari and Adventure and enter the 'Foilcade Challenge' competition. Details with cassette or send SAE.

ALL GAMES £5.95 EACH, 2 FOR £9.95,
3 FOR £13.95 (ANY MIX) INCLUSIVE

FOILKADE LTD

DEPT PCT3

66 LITTLEDEAN, YATE
BRISTOL BS17 4UQ

VIDEO GENIE & TRS80 MODEL I

DP2000

DIRECT FROM
THE MANUFACTURER

The DP2000
combines a CANON
6106 Disk Drive with
integral Disk and printer interface
in a sleek but sturdy, steel case

A DISK DRIVE THAT
PLUGS DIRECT TO THE
KEYBOARD FOR ONLY

★ £220.00 ★
With a FREE parallel
printer interface

All you need is
your computer and a
Disk Operating System
(We even include the 13 amp plug!)
(Extra drives can be connected.)

DP2000

NO EXPANSION
INTERFACE REQUIRED

PLUG-IN POWERFUL SOFTWARE

This small unit plugs into the edge connector at the back of your computer (you do NOT need to open the case). By using our "splitter cable" you can use it with other peripherals.

Feature ROM "A" provides single key commands, flashing cursor, key repeat, machine code monitor and SYSTEM program load and save facilities.

Feature ROM "B" provides single key commands, flashing cursor, lower case keyboard inverter, BASIC line re-number/program MERGE/compress memory saver and screen dump to printer.

Feature ROM "A" or "B" complete -

Video Genie £29.95
TRS80 £34.50
Extra ROM (for either) £18.95
Splitter cable £14.50

Tantel-Prestel Adaptor

With cuts interface for computers full colour Teletext access. Standard UHF TV connection £160

PARALLEL PRINTER INTERFACE WITH DISK CONTROLLER

Plugs DIRECT to the keyboard
DP1000 £76 only

Comes complete with power supply in sleek, sturdy, steel, case.

MEMORY EXPANSION TO 48K

£43.50

Easily fitted inside the keyboard unit.
No expensive interface required.

fig. FORTH disk operating system £25.00

Book - Discover FORTH by Thoe Hogan £11.95

COMPUTERS

Genie I £287.00
Genie II with numeric keypad £260.00
Genie I with 48K internal RAM £318.00
Genie II with 48K internal RAM £297.00
Colour Genie 16K £168.70

PRINTERS

EACA EG3085 (120cps dot matrix) £357.00
EG603 (genie microprinter) £200.00
Brother HR1 (low cost daisy-wheel) £630.00

DISK DRIVES

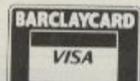
Teac	Single	Dual
40 track	£185.00	£330.00
80 track	£245.00	£399.00
80 track double-sided	£359.00	£675.00
CANON slim drives	Bare drive	With case and P.S.U
6106 40tk. S.S.	£139.00	£169.00
6108 40tk. S.D.	£169.00	£199.00
220 80tk. D.S.	£229.00	£259.00

CREDIT
FACILITIES
AVAILABLE

GENERAL NORTHERN MICROCOMPUTERS LTD

(DEPT. WM8) 8 WHITWORTH ROAD, SOUTH WEST INDUSTRIAL ESTATE, PETERLEE, Co. DURHAM SR8 2JJ
TELEPHONE: PETERLEE (0783) 860314

All prices are exclusive of VAT & Carriage (Telephone for further details)



YOUR LETTERS

This page is where you get the chance to put your opinions in print. Personal Computing Today welcomes letters from you on any aspect of microcomputing and views in general – as long as they're printable!

Please drop us a line to: The Editor, Personal Computing Today, 145 Charing Cross Road, London, WC2H 0EE.

Dear Sir,
 Congratulations on producing a great magazine. I especially like your column on Add-Ons where you give a complete description on each peripheral, price and where it can be bought.

One criticism, however is that you do not print any information (e.g. price and where available) for your large Irish readership. I hope that you will take steps to rectify this situation or at least give it some serious thought.

Yours faithfully
 Tony Power
 Eire

Editor's reply: Thanks for the comments Tony. The reason we chose to give just the manufacturers address is that it is almost impossible to try and track down every supplier and the price of a product. By contacting the manufacturer you should be able to find out the address of your nearest supplier. Failing that they should be able to arrange to send you the goods.

Dear PCT
 I wish to point out an omission in the logic for the TI-99/a program, "Blackjack", in your June issue. As the program stands, five-card tricks are treated as ordinary totals, when in fact they should be regarded as second only to 'Blackjack'.

So add the following lines to complete an otherwise excellent program.

2632 IF(CCT(4) >= 5) = -2 THEN 2720	comment 5 card tricks for bank + player result — draw * CCT() = Card Count
2634 IF CCT(4) < 5 THEN 2636	If bank < 5 cards, check player
2635 IF TOTAL(4) = 0 THEN 2670 ELSE 2700	Pay player if bust otherwise bank wins
2626 IF CCT(T) >= 5 THEN 2660	If card count >= 5 then player wins

*increment card count
 3330 CCT(T) = CCT(T) + 1
 3335 RETURN

*Reset
 2875 LET CCT(RESET) = 0

Yours sincerely
 Peter Shaw
 P.S. Should you wish to distinguish between two five-card tricks, then edit line 2632 to read: "THEN 2640", to compare totals.

Dear PCT
 I expect you receive hundreds of letters asking why you don't leave 'Micro Factfile' out of the magazine. Although I have a computer and do not read this part of the magazine I wish to support you on keeping this reference.

A few months ago a friend of mine was knocked down. His legs are paralysed and he is unable to go to school, so his mother and father are going to buy him a computer. Unfortunately they do not know which is the best at a reasonable price. The Micro Factfile supplies all this information which is now helping the boy. There must be many more children like this, so on behalf of these children keep the Micro Factfile!

Yours faithfully
 Kevin Gardiner
 Chepstow

P.S. May I make a suggestion. Many people are becoming interested in adventures. Why don't you keep a separate page for reviews on adventures and cut out some of the advertising.

P.P.S. I enjoy reading your magazine.

Editor's reply: You will be pleased to hear that we have no plans to drop the Factfile. It didn't appear last month because we ran a special feature on the top ten micros. As for the software reviews, we try and give a balanced view of the software that is available. This doesn't mean we will ignore adventure programs, they will be incorporated as and when we get them.

Dear Sir,
 I would support John Ryden's letter praising Commodore. (May 1983). My VIC-20 developed a fault, preventing the use of a light pen. This was attended to by Commodore but I unfortunately had to return the VIC again because the fault persisted. Without any quibble the service section exchanged the VIC-20. Well done Commodore.
 Yours faithfully
 R Gardner
 South London

Dear PCT
 I was shocked and unhappy about the review on the Oric 1 you did in your March issue. Not only was it short but it didn't explain the full capabilities of what the computer can really do. I understand that the machine used was a pre-production Oric as stated in the article so of course some functions were incorrect.
 e.g. the high resolution graphics. After reading it I felt it has been run down and not adequate but well worth it for its price. Also my view is that it offers more functions

than most micros have today. e.g. Prestel, double height characters, hi-fi output etc, so it is something special.

Yours faithfully
Adam Kirkpatrick

East London

P.S. When you are going to publish program listings for the Oric?

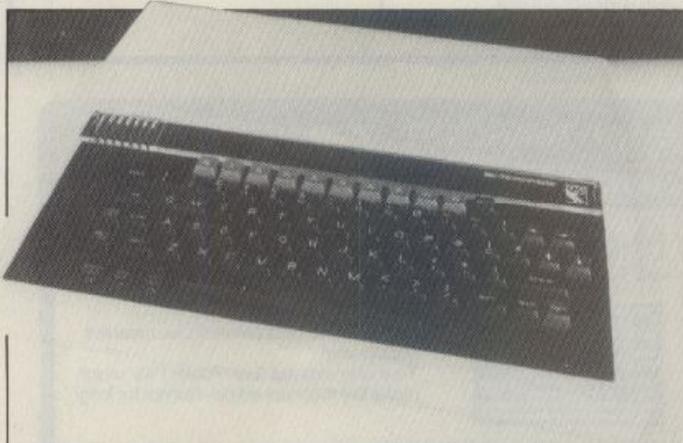
Editor's reply: I'm sorry you weren't entirely happy with the review of the Oric 1 computer. Unfortunately, due to Oric Products' much delayed delivery time our reviewer was forced to carry out his review over the Christmas period in order to meet publishing deadlines. The fact that the machine was a pre-production model didn't help matters. In a future issue of Personal Computing Today there will be a comparative review of the Oric 1 and the ZX Spectrum to give readers a much clearer idea of the machine's capabilities.

Dear PCT,

Please would you announce a new software house set up for the Oric 1 and it's users. The firm is called Mercury Software. We intend to produce full arcade quality games for the Oric 1 micro. Already we have a real time space invader selling at just £4.95, in full colour, sound and hi-res graphics. A copy of which will be forwarded for a full review by yourselves. We will soon be announcing Pacman and Digger also retailing at £4.95. Many thanks. Mercury Software is located in Manchester.

Yours faithfully

Paul Ralphs



Dear PCT

I must congratulate you on the production of THE best computer magazine. I receive every issue of it with great pleasure.

There are a number of people who are writing to you saying that the BBC Microcomputer is highly over-rated. Others are saying that it is no better than any other microcomputer. I must disagree with both "ideas" by STATING that the BBC Microcomputer is the fastest microcomputer in its price-range. It uses an MHz 6502 processor, the colour graphics are brilliant, the 4 channel sound generator is fantastic, and so are all the other main features. 32K RAM is not the BBC's full memory; 64K of RAM can be added on via a second processor (i.e. 6502 or Z80). As a matter of fact, people are under-estimating the BBC's functions. It is impossible to compare something like a ZX81 with the might of a BBC Microcomputer.

I own a BBC model B with 32K of RAM. I'm not boasting, for with a BBC Microcomputer, I don't need to!

A number of my friends have ordered Sinclair machines. Sinclair have clearly stated on all adver-

tisements that you are to allow up to 28 days for delivery; one of my friends waited 3 months for his Spectrum only to find the "ZX SPECTRUM COLOUR & SOUND" didn't work at all.

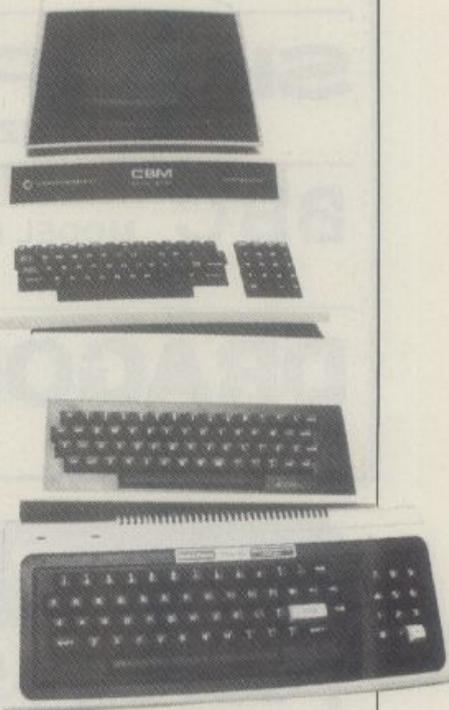
M J Penning

S. Glamorgan

Dear Sir,

In response to W G Adams, having purchased a Commodore 64 in early February, I had not long to wait before I had a host of programs running on the machine. Thus, I thought I would provide a few addresses for any 64 owners who want high quality software.

1. Llamasoft Software
49, Mount Pleasant
Tadley
Hampshire RG26 6BN
2. Rabbit Software
380 Station Road
Harrow
Middlesex
3. Audiogenic Ltd
PO Box 88
Reading
Berkshire
4. Supersoft
Winchester House
Canning Road
Wealdstone
Harrow
Middlesex HA3 75J
5. Interceptor Micros
Lindon House
The Green
Tadley
Hampshire
6. Maplin Electronics
PO Box 3
Rayleigh
Essex
7. Adamsoft: telephone on weekdays or evenings
0706 524304.



Also, do not forget when Commodore launch the 64 software (already overdue) the amazing virtues of the 64 can be seen. I also agree with your idea of converting Pet 3000 and 4000 programs to run on the 64. This I have managed successfully with 'the Valley'. However, when will Simon's BASIC for the Commodore 64 be available? I have been informed that it is a very comprehensive extension to 64 BASIC. Can you help with a few comments, or is a review too much to ask for?

Yours faithfully

S Sethi

Editor's reply: Thank you very much for supplying that information, I am sure all 64 owners will appreciate it. As for your query about Simon's BASIC apparently it has been ready for some months now, but Commodore has still not decided whether to bring it out on cassette or disc. This seems to be the hold-up at present. When it does appear Personal Computing Today will carry a review of the new BASIC. So watch out for it on our pages.

3D COMPUTERS

THE
HOME COMPUTER
SPECIALISTS

commodore 64
64K £299.00

ORIC-1
48K £149.95

SHARP
48K MZ-80A P.O.A.

BBC MODEL B
32K £399.00

DRAGON 32
32K £175.00

SOFTWARE

PROGRAM POWER
BUG-BYTE
SUPERIOR SOFTWARE
A + F
SIMON HESSEL
MOLIMERX
PHOTRONICS
ACORNSOFT

PERIPHERALS

DISCS SINGLE/DUAL
TORCH Z80 DISCS
CUMANA DISCS
PRINTERS
JOYSTICKS
MONITORS B&W/COLOUR
LIGHT PENS
BBC BUGGY

Large range of Books, Diskettes,
Cassettes and Printer paper
always in stock.

Easy Parking at all Branches

TOLWORTH

230 Tolworth Rise South, Tolworth,
Surrey KT5 9NB
Tel: 01-337 4317

SUTTON

30 Station Road, Belmont,
Sutton, Surrey SM2 6BS
Tel: 01-642 2534

EALING

114 Gunnersbury Avenue,
Ealing, London W5 4HB
Tel: 01-992 5855

RICKMANSWORTH

Greystone Works,
The Green, Croxley Green,
Rickmansworth Herts WD3 3AJ
Tel: 0923 779250

MILTON KEYNES

Unit 1, Heathfield, Stacey Bushes,
Milton Keynes MK12 6HP
Tel: 0908 317832

NEWBURY

26 Stanley Road, Newbury,
Berks RG14 7PB
Tel: 0635 30047



An Exciting range for 16K ZX81
from SOFTWARE FARM



SUPER SCRAMBLE

YOUR MISSION

To penetrate the witches defences, enter her cavern and destroy her wicked heart.

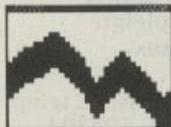
THE WITCHES DEFENCES

Stalagmites and stalactites - which grow across your path.

Volcanoes - to get past alive - if you can!

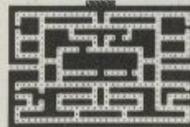
Vampire Bats - that cling to your ship and make controls sluggish

Cave-ins - should you hit the side of the cave with your Laser Cannon or Bomb, part of the roof will cave in on you



- Written entirely in machine code
- Hall of Fame
- 1 or 2 players
- Mystery score positions to bomb
- 5 skill levels

GOBBLERS Mk 2



Beat that high score!

Gobble those dots before those meanies gobble you!

Your only aids are four 'Power Pills' which make the meanies edible. But not for long!

- Machine coded for fast action
- Extra 'Gobbler' for 10,000 points
- On screen scoring
- High score with enter name facility
- Up to 4 players

Improved Mk 2
version!

ASTEROIDS

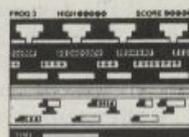
Stay alive as long as possible in open space filled with flying rocks. Score by shooting them - which also causes them to break into lots of little bits and makes life even worse!

- Machine coded for fast action
- On screen scoring
- High score with enter name facility
- Up to 4 players
- Extra ship for 1,000 points (not as easy as it sounds!)
- Ship moves just like arcade version
- Rotate left/rotate right/thrust
- Fires in all 8 directions
- Increasing number of asteroids
- Three asteroid sizes
- 'alien spaceship (fires' back!)

All games
£5.95 each

NEW!

FROG HOPPER



- 50 Skill levels!
- Played against the clock - froggie only has a short while to live!

Jump your frog over the lanes in the road - preferably without being turned into jam by the approaching traffic! Then cross the river by hitching a few rides on some passing logs and finally into the safety of your hole on the opposite bank. Once all 'Frog Holes' have been filled you start again with a different pattern and a bonus frog.

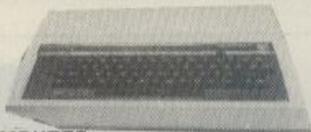
when more than one
game purchased deduct
£1.00 from each tape!

Send your order to:

Design Dept THE SOFTWARE FARM, Craigo Farm, Botany Bay, Tintern, Gwent

BBC Microcomputer System

OFFICIAL
BBC
MICROCOMPUTER
DEALER



BBC Microcomputer System

This is the best microcomputer currently on the market. 32K of RAM, 32K ROM, 8 modes of operation, full colour, full size keyboard, internal expansions — in short a personal computer capable of expanding into a small business computer.

BBC Microcomputer Mod E	£348 + VAT =	£399.00
BBC Mod B + Disk Interface	£409 + VAT =	£469.00
BBC 100K Disk Drive	£230 + VAT =	£264.00
BBC 500K Dual Disk Drive	£699 + VAT =	£803.85
Torch Light Pen for BBC Micro	£85 + VAT =	£74.75
Torch 800K Dual Disk Drive + Z80 Processor and 64K RAM, CPN Operating System supplied complete with Disk Interface Kit	£799 + VAT =	£918.85
BBC Games Paddles	£11 + VAT =	£12.65
Parallel Printer Cable	£10 + VAT =	£11.50

100% BBC COMPATIBLE MITSUBISHI SLIMLINE DISK DRIVES

Double sided, double density, 80 TRKS, supplied in a specially designed case for the BBC microcomputer complete with cables, utilities disc and user guide.

Single 400K Drive	£239 + VAT =	£274.85
Dual 800K Drives	£449 + VAT =	£518.35
Single 400K switchable 4080 tracks £249 + VAT =		£286.85

We stock a large selection of Software for BBC. Please send S.A.E.

TORCH Z80 DISC PACK FOR BBC MICRO

This includes DUAL (800K) disc drives, 64K RAM, Z80 2nd processor CP/M compatible operating system (CPN). This enables you to use a range of standard business Software and other programming languages such as PASCAL, C, BCPL, FORTRAN, LISP and COBOL. (Please note — these languages are not included in the price).

SPECIAL OFFER: Torch Z80 Disk Pack + Disk Interface Kit for BBC Micro

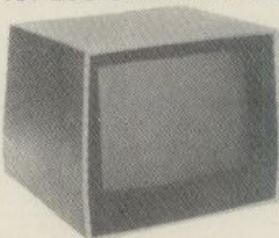
.....	£799 + VAT =	£918.85
Torch Z80 Disc Pack	£780 + VAT =	£897.00
Torch Light Pen for BBC	£65 + VAT =	£74.75

COMPLETE WORD PROCESSOR FOR ONLY £1,099 + VAT

This package consists of BBC Microcomputer, View Processor, 400K Disk Drive, High Resolution Green Monitor, Daisy Wheel Printer and all the necessary cables and documentation.

OUR SPECIAL PACKAGE DEAL
PRICE £1099 + VAT = **£1263.85**

PROFESSIONAL MONITORS

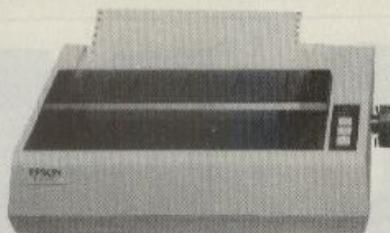


GREEN MONITORS 12" green screen monitors with composite and sync. input. Suitable for most computers. 18 MHz Bandwidth High Resolution: £89 + VAT = **£102.35**
15 MHz Bandwidth Normal Resolution £69 + VAT = **£79.35**

COLOUR MONITORS MICROVITEC RGB input monitor, normal resolution. As used with BBC computer. Metal cabinet.
Cub Microvitec. £239 + VAT = **£274.83**

SANYO RGB monitors in plastic cabinets.
SCM14N — normal resolution 400 Dots. £239 + VAT = **£274.83**
SCM14M — medium resolution 600 Dots. £339 + VAT = **£389.85**
SCM14H — high resolution 800 Dots. £479 + VAT = **£550.85**

EPSON FOR RELIABILITY



EPSON FX80: 80 column, 180 CPS, normal, italic and elite characters, 256 user definable characters, superscript, subscript, 11 x 9 matrix, bidirectional logic seeking, hi-res bit image printing (960 x 9 dots/inch), friction and pinteel, 9 international character sets, Centronic parallel interface.
FX80 PRICE £379 + VAT = **£435.85**

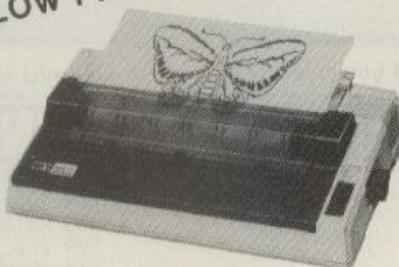
EPSON RX80: 80 column, 100 CPS, normal, italic and elite characters, 11 international character sets, hi-res bit image printing, bi-directional logic seeking, 4" to 10" adjustable pin-feed, Centronic parallel interface.
RX80 PRICE £259 + VAT = **£287.85**

MX-100 136 column, 10 CPS, friction and tractor feed, up to 15 adjustable carriage, hi-res bit image printing, true descenders, Centronic parallel interface.
MX-100 PRICE £419 + VAT = **£481.85**
RS232 interface for all above Printers £55 + VAT = **£63.25**

GUARANTEED LOWEST PRICES

We guarantee that our prices are the lowest on the market. If you can find any item advertised and in stock at less than our price we will match that price.

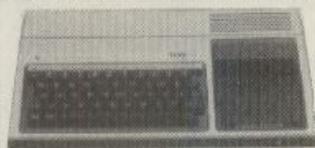
NEW LOW PRICES STAR DP



The most cost effective quality matrix printers to be launched this year. DP510 and DP515 features include friction and tractor feed and roll rollers as standard. 100 CPS print speed, bi-directional logic seeking, 9 x 9 matrix gives true descenders, 2.3K buffer as standard. Hi-res bit image plus book graphics, sub and super script, italic printing, auto underlining, vertical and horizontal tabulation, left and right margins set, skip over perforation, back space and self test.

STAR DP510 10" Carriage 80 Columns: £269 + VAT = **£309.35**
SPECIAL PRICE
STAR DP515 15" Carriage 136 Columns: £369 + VAT = **£424.35**
SPECIAL PRICE
RS232 INTERFACE FOR ABOVE £50 + VAT = **£57.50**

TEXAS INSTRUMENTS TI 99/4A



This microcomputer is based on TMS9900 16 bit microprocessor. It includes 16K RAM, 16 colour high resolution graphic (192 x 256). The screen display is 32 characters, 24 lines TI-BASIC. Full size keyboard. For Software there are about 1000 Programs to choose from. There are a lot of peripherals available e.g. Disk Drives, Disk Interface, Speech Synthesizer, Extra RAM, Additional Languages (PASCAL, TI-LOGO, ASSEMBLER).

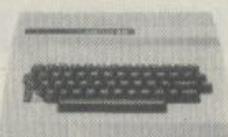
TI Home Computer & Cass Lead £130.40 + VAT = **£148.95**
Peripheral Expansion System £126.04 + VAT = **£144.95**
Disk Controller Card £130.40 + VAT = **£148.95**
Single Disk Drive £173.87 + VAT = **£199.95**
Speech Synthesizer £36.49 + VAT = **£41.95**

FREE

If you buy TI Home Computer before 2nd July 83 TEXAS INSTRUMENTS will supply FREE one pair of Joysticks, connect four game and beginners basic tutor cassettes. If you buy 8 software modules before 2nd July 83 TEXAS INSTRUMENTS will supply FREE speech synthesizer.

We are official dealers for BBC Microcomputer System/Amorn Computers, Texas Instruments Home Computers, Y.E. Data Business Computers and Torch Computers.

DRAGON 32



A powerful computer specially designed for the family and small business use. It has 32K RAM, 16K Microsoft extended colour basic, high resolution colour graphics, 9 colours 256 x 192, Centronic parallel printer interface, professional keyboard and five octaves of sound.

DRAGON 32 with Cass Lead. £165 + VAT = **£189.75**
DRAGON JOYSTICKS (Pair) £17.35 + VAT = **£19.95**
PRINTER CABLE £10 + VAT = **£11.50**
A large range of Software is available on cassettes. Please send S.A.E. for details.

SEIKOSHA DOT MATRIX PRINTERS WITH HIGH-RES GRAPHICS



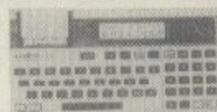
AP-100A: 80 column, 30 CPS, Dot addressable hi-res graphics, 10" wide adjustable tractor feed, 7 x 5 print matrix, Centronic parallel interface.
AP100A PRICE £169 + VAT = **£194.35**
FRICION FEED ADAPTOR £25 + VAT = **£28.75**
GP-250X: 80 Column, 50 CPS, tractor-feed 10" wide fully adjustable, true descenders, 64 user definable characters, double height and/or double width printing, 8 x 5 print matrix, Centronic parallel and RS232 (serial) interface both included.
GP-250X PRICE £229 + VAT = **£263.35**

NEW ARRIVALS

- Shinwa CP80 Printer, Centronic Parallel Interface code compatible with Epson MX80. Price £269 + VAT **£309.35**
- Juki Daisy Wheel Printer with Centronic Parallel Interface Price £369 + VAT = **£424.35**
- Four Colour Printer
Centronic Parallel Interface, supplied with ten pens.
Price £130.40 + VAT = **£148.95**

PLEASE PHONE FOR FURTHER DETAILS ON THESE ITEMS

CASIO POCKET COMPUTERS



CASIO FX-802P: Pocket computer with scientific function and built-in mini computer, uses BASIC language, 1568 program steps, QWERTY keyboard, 12 char. display.
FX802P £

CASIO FX-700: Pocket computer with scientific functions, BASIC language, 1568 program steps, QWERTY keyboard, 12 char. display.
FX700P £

CASIO PB-100: Pocket computer, BASIC language, 544 program steps (expandable 1568 steps), QWERTY keyboard, 12 char. display.
PB-100 £34.74 + VAT = **£39.95**

FA-3 Cassette Adapter for FX700 & PB100 £17.35 + VAT = **£19.95**

FP-12 Printer for FX700 and PB100 £

FP-12 Price £

FX-602P Scientific calculator with 512 program steps and 88 memories. Price £39 + VAT = **£44.85**

SHARP PC-1251 COMPUTER WITH PRINTER AND MICRO CASSETTE £146.95 + VAT

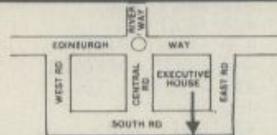


New pocket computer with 24K Bytes System ROM, 4K RAM, BASIC LANGUAGE, 24 character liquid crystal display, QWERTY keyboard + numeric pad + user defined keys, 24 column thermal printer, Microcassette recorder for data storage, battery charger and demonstration cassette supplied in an attractive case.
PC-1251 + CE-125 £146.95 + VAT = **£169.00**

Akhter Instruments Ltd.
EXECUTIVE HOUSE, SOUTH RD, TEMPLEFIELDS,
HARLOW, ESSEX, CM20 2BZ, UK.
TEL: HARLOW (0279) 443521 OR 413639
TELEX 995801 REF — PCT

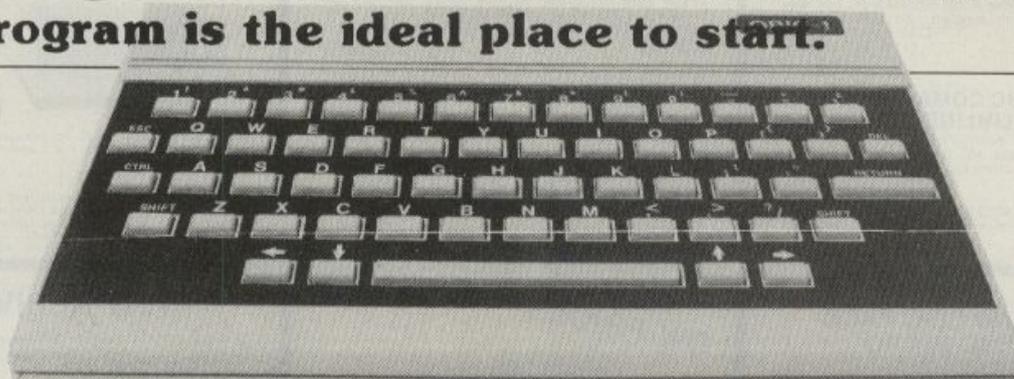
ORDERING INFORMATION:

All orders which accompany a cheque, cash or postal orders are **CARRIAGE FREE** (UK only). Please make cheques and postal orders payable to "AKHTER INSTRUMENTS". A carriage charge of 3% of invoice total is applicable to BARCLAYCARD and ACCESS orders. We accept official orders from Government and Educational establishments. We accept VAT FREE EXPORT orders, please phone or write to check shipping cost.
OPENING HOURS: MON-FRI 9am-5.30pm, SAT 10 am-2pm.
We welcome callers, no parking problems.



ORIC DEMO

Just got an Oric-1? Michael Ormerod's demo program is the ideal place to start.



All you need do is type it straight in.

PROGRAM LISTING

```

10 REM ORIC-DEMO
20 REM BY M.E. ORMEROD
30 CLS
40 PRINT
50 PRINT
60 PRINT" HELLO WELCOME TO ORIC"
70 FOR G=48040 TO 48082 STEP 40
80 POKE G,17
90 NEXT G
100 FOR N=48082 TO 48122 STEP 40
110 POKE N,12
120 NEXT N
130 PRINT
140 PRINT
150 PRINT" I WILL SHOW YOU WHAT I CAN DO"
160 WAIT 500
170 CLS
180 PRINT" I CAN MAKE SOUNDS AT A SINGLE COMMAND"
190 PRINT" YOU CAN TYPE: SHOOT,EXPLODE,ZAP,PING"
200 PRINT" LET'S TRY THEM, ONE AT A TIME"
210 WAIT 500
220 CLS
230 POKE 48040,18
240 PRINT"EXPLODE"
250 WAIT 100
260 FOR T=1 TO 3
270 EXPLODE
280 WAIT 100
290 NEXT T
300 PRINT"SHOOT"
310 WAIT 100
320 POKE 48080,19
330 FOR N=1 TO 3
340 SHOOT
350 WAIT 100
360 NEXT N
370 PRINT"ZAP"
380 POKE 48120,20
390 FOR R=1 TO 3
400 ZAP
410 WAIT 100
420 NEXT R
430 PRINT"PING"
440 POKE 48160,21
450 FOR K=1 TO 3
460 PING
470 WAIT 100
480 NEXT K
490 WAIT 200
500 CLS
510 PRINT
520 PRINT
530 PRINT" WATCH THIS FOR A FARTY TRICK"
540 WAIT 500
550 CLS
560 LORES 0
570 FOR D=48040 TO 49119
580 POKE D,INT(RND(1)*7+16)
590 NEXT D
600 PLOT 16,12,"NOT BAD EH!"
610 WAIT 500
620 CLS
630 PRINT
640 PRINT
650 PRINT" HOW ABOUT THIS FOR AN ENCORE!"
660 WAIT 400
670 HIRES
680 FOR N=48960 TO 49709 STEP 40
690 POKE N,INT(RND(1)*7+16)
700 FOR W=0 TO 1100 STEP 40
710 SOUND 1,W/2,0
720 PLAY 1,0,5,5
730 NEXTW,N
740 PLAY 0,0,0,0
750 WAIT 400
760 CURSET 120,100,3
770 CIRCLE 50,1
780 WAIT 200
790 CURSET 90,70,3
800 DRAW 60,0,1
810 DRAW 0,60,1
820 DRAW -60,0,1
830 DRAW 0,-60,1
840 WAIT 300
850 CURSET 0,70,3
860 FILL 60,1,18
870 WAIT 500
880 LORES 0
890 PLOT 16,12,"THANK YOU-GOODBYE."
900 WAIT 300
910 EXPLODE
920 CLS
930 WAIT 1000
940 GOTO 30

```

SELL, EXCHANGE or BUY SOFTWARE

the
**COMPUTERHOUSE
WAY**

By becoming a member of COMPUTERHOUSE and entering your unwanted software on the COMPUTERHOUSE lists (which are circulated to all members) you get the opportunity to sell or buy software at 80% of its original cost. Alternatively as a member you can simply exchange at no extra cost to yourself other than postage.

MEMBERSHIP ONLY £12.95 per annum

For further details of membership and other benefits send large SAE to:

COMPUTERHOUSE (PCT)

Freepost

ILFORD, ESSEX IG1 2BR

NAME _____

ADDRESS _____

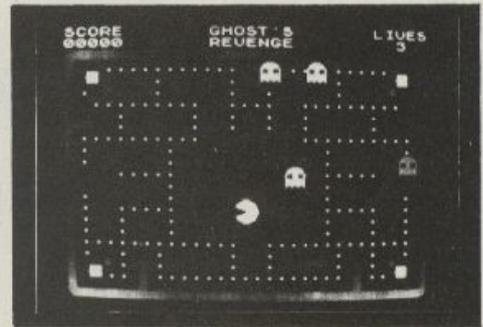
2x spectrum

NEW!

GHOST'S REVENGE

by Dominic Wood

The best maze-chaser game available for the Spectrum *Super-fast machine code action *Excellent graphics *Full use of colour *Sound effects and tunes *Normal or Invisible maze *Skill level selector, novice to expert; this game cannot be beaten *Usual features, gobble action, four ghosts, power pods that turn the ghosts blue, blue ghosts give 400, 800, 1200, 1600 bonus points. Top score, for Spectrum 16k or 48k. ONLY £5.95

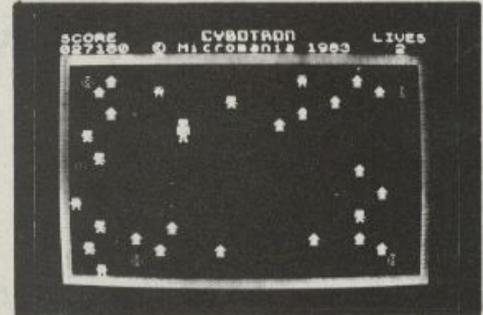


NEW!

CYBOTRON

by Dominic Wood

New from Micromania, this has to be one of the best arcade type games available for the Spectrum. Blast away the attacking robots before they get you *Super-fast 100% machine code action *Excellent, smooth full colour graphics *Explosive sound effects *Four different types of robots *Deadly accurate bombs *With up to 50 robots on screen at a time, this game cannot be beaten. Top score, for Spectrum 16k or 48k. ONLY £5.95



PRICES ARE FULLY INCLUSIVE. GUARANTEED DESPATCH BY 1ST CLASS RETURN POST. TRADE INQUIRES WELCOME

MICROMANIA

Send cash/cheque/PO to: Micromania, 14 Lower Hill Rd., Epsom, Surrey, KT19 8LT. Please write clearly your Name, Address and magazine & month this advert was seen in.

Dragon & Dungeon



NUMBER ONE FOR THE DRAGON

LATEST DRAGONWARE

ARCADE GAMES: 'Mined Out' (Quicksilver) £5.95, 'Dragonhawk' (Pentagon) £6.95, 'Vultures' (Dragon Galaxians, Morrison) £6.95, 'Droids' (great new action game, Morrison) £6.95, 'Drone' (Tron-type game, Cable Software) £8.75, 'Spider' (Premier) £4.95, 'Bopswizzle' (beat the Gloops, Smoochers and Yarkies!) £5.95, 'Scanner' (an entirely new style of arcade game by Bamby) £8.45, 'Sniper' (Soft Joe's) £6.50.

Watch out for the best arcade game yet — Programmers' Guild's fantastic 'Ninja Warrior' (17 screens!). In stock shortly.

ADVENTURES: 'Alien Odyssey' (the first two parts of a giant 60K-plus saga) £9.95, 'Into the Labyrinth' £7.95, 'Danger Island' £6.95, 'Chateau' £7.95, 'Jungle Search' £6.95, 'Volcanic Dungeon' £5.00.

Best-seller still Winterson's mammoth 'Ring of Darkness' £10.00.

JUNIOR PROGRAMS: 'Baby Dragon' (Teddy Bears' Picnic and Koko the Clown) £5.95, 'St. George and the Dragon' £6.95, 'Pirate' £8.50, 'Infant Pack' (pre-school letters and numbers) £3.95, 'Action Pack' (mazes and simple arcade) £3.95.

UTILITIES: Editor/Assembler/Monitor cartridges and manuals Compuserve £30.45, Mace £29.95, RS232 Interface Unit £49.50, Monitor Sound Unit £37.50, Salamander Graphics System £9.95.

BOOKS: 'Dragon Extravaganza' £4.95, 'Making the Most of your Dragon' (highly recommended) £5.95, plus 50p postage, 'The Power of the Dragon' £5.95, plus 50p postage, 'Learning to use the Dragon 32' £4.95, 'Dynamic Games for the Dragon 32' £4.35, 'Know your Dragon' (a friendly introduction to a friendly computer) £5.95.

DRAGON OWNERS CLUB

The Dungeon is also the home of the largest Dragon Owners Club in the UK (or, since members are scattered through Europe to Africa and the Middle East, should we say "the world"!).

The club magazine, *Dragon's Teeth*, is published monthly and includes news, reviews, advice and information exchange for dedicated Dragon-bashers. Free members' adverts, monthly offers (some members have already saved the cost of their subscription), competitions and, for extrovert Dragonards, badges and bomber jackets.

Annual Membership: £6.00 (£8.00 overseas), Six-month Trial Sub £3.25 (£4.25 overseas)



P.O. Box 4, Ashbourne, Derbyshire, DE6 1AQ. Tel: (0335) 44626

QUESTION

WHERE CAN I BUY

NEWBRAIN 'A' 32K	FOR	£268.00
NEWBRAIN 'AD' 32K	FOR	£298.00
SINCLAIR ZX81 1K	FOR	£48.00
SINCLAIR SPECTRUM 16K	FOR	£99.00
SINCLAIR SPECTRUM 48K	FOR	£129.00
ORIC-I 48K	FOR	£168.00
SINCLAIR ZX PRINTER	FOR	£39.00
SINCLAIR ZX81 RAM PACK	FOR	£28.50
SEIKOSHA GP-250X PRINTER	FOR	£260.00
SEIKOSHA GP-100A PRINTER	FOR	£215.00
BMC BM12E GREEN MONITOR	FOR	£100.00
SANYO SCM12H GREEN MONITOR	FOR	£100.00
SANYO SCM12N GREEN MONITOR	FOR	£85.00

CARRIAGE: 1 item £4.00, 2 items £3.50 each, 3 items £3.00 each, 4 or more FREE

ANSWER:-



MICROCELL COMPUTER SYSTEMS

New Brain

APPOINTED STOCKIST

FOR ACCESS PHONE ORDERS, PLEASE RING (0532) 681366

MICROCELL COMPUTER SYSTEMS, P.O. BOX MT12, LEEDS 17, YORKSHIRE

NAME _____		PLEASE SEND ME	
ADDRESS _____		_____	
_____		_____	
SIGNED _____		TOTAL £ _____	
FOR OUR COMPLETE PRICE LIST		+ CARRIAGE £ _____	
PLEASE TICK <input type="checkbox"/>		TOTAL ENCLOSED £ _____	
PLEASE DEBIT MY ACCESS NO		_____	



KRAZEE KONG

Lucas Venter's program turns your Atari into an arcade machine.

The ugly gorilla, Kong has captured a beautiful young girl, and taken her to the top of a building. You, as the dashing hero, have to save her, jumping over the barrels Kong is tossing at you, and kill him. Krazee Kong is written for the Atari 400/800 with a minimum memory of 16K. The game is played with the joystick inserted in port 0, but can be rewritten for the

keyboard without too much trouble. On running Krazee Kong for the first time, the message, "KRAZEE KONG, PLEASE WAIT" will be displayed on the screen. After a while the question, "LEVEL?" will be displayed. Enter a number from one to nine. The game playground will be displayed. Upon pressing the START button, your little figure will appear in the

bottom left corner. Kong will immediately start tossing barrels and you will have to be ready. Pressing the red controller button for at least half a second, will make your figure jump. He will stay in the air for three seconds and then fall back to the earth. Jumping on top of a barrel will not register as a hit, but landing in one's way will. You score one point

for jumping over a barrel. On some parts the roof is lower. You will be unable to jump here. Push the joystick in the direction you want to move. You may only go upwards and downwards when below or above the ladder, (you are safe from barrels below the ladder.) When you have reached the solid wall next to Kong, be careful, because you are immediately transported to your starting position when Kong is killed, and that might just be in the way of an oncoming barrel. To be safe, only use the ladder going to Kong when there are no barrels



near the starting position.

Scoring is as follows: one point for jumping over a barrel and 100 for the destruction of Kong. An extra life is scored for every 300 points, and the score resets to zero when above 999. The game is fast for BASIC, because each character is not individually plotted but is a redefined character. This allows more colours and speeds up the program. Its only disadvantage is, that movement is restricted to one character at a time. As the game progresses, the barrels will begin moving faster until you get killed.

HOW IT RUNS

20-340	Character set redefinition.	660-855	Joystick movement routine.
350-465	Draws playfield and sets colours.	860-895	Get killed.
470-477	Main program loop. Extra life. Scoring.	900-930	Game over. Wait for the START button.
480-580	Barrel movement routine.	1000-1040	Kong killed. Add 100 points to score.
590-650	Kong's movement routine.		

Variables:

A, B and Q:	General use. (Sound, etc.)	K:	Kong's horizontal position.
ABAR(A):	Horizontal position of barrel A.	POS:	Character at Location X,Y
BBAR(A):	Vertical position of barrel B.	F:	Jumping flag.
PA(A):	Previous horizontal position of barrel A.	CT:	Duration of jump.
PB(A):	Previous vertical position of barrel A.	ART:	Time for changing RATE.
SCORE:	Score.	ST:	STICK(0)
LIVES:	Number of lives.	BT:	STRIG(0)
RATE:	Rate of barrel speed.	L:	LEVEL
X:	Horizontal position of man.	M1, M2:	Previous position of man before going up ladder.
Y:	Vertical position of man.	CHSET, CHORG:	Character set definition locations.

HINTS ON CONVERSION

Kraze Kong is written in Atari BASIC, which is quite similar to Microsoft BASIC. It isn't really suitable for computers without character set redefinition. It uses GRAPHICS 2 + 16, which gives the computer a screen resolution of 20 by 12 in 5 colours. The characters are twice their normal size. It ought to be convertible to computers like the VIC-20 and ZX Spectrum without too much modification. Just note that the PLOT, COLOR and DRAWTO

commands are different in this mode. COLOR is the ASCII code for the character to be plotted and PLOT x,y PRINTs the character at that location. It is similar to the Spectrum's PRINT AT command. The POKES at line 400 change the screen, border, background and character colours and can be achieved by the BBC computer by using the VDU19 command.

PROGRAM LISTING

```

20 DATA 60,62,60,60,40,40,8,62
30 DATA 56,56,16,56,84,16,40,68
40 DATA 60,60,195,189,189,189,153,255
50 DATA 60,60,60,60,60,36,36,102
60 DATA 0,0,0,60,60,60,24,255
70 DATA 189,189,189,189,189,36,36,102
80 DATA 0,126,90,126,126,24,0,24
90 DATA 126,129,189,161,161,189,129,126
100 DATA 0,0,0,0,126,159,159,126
110 DATA 255,255,153,102,102,153,255,255
120 DATA 255,129,255,129,255,129,255,129
130 DATA 255,255,255,255,255,255,255,255
140 DATA 255,0,234,170,235,0,255,255
150 DATA 0,0,41,237,237,255,255,255
200 DIM CHAR$(14)
210 CHAR$="!#,.&'@(<>)-=+"
215 GRAPHICS 2+16
220 POSITION 5,4: ? #6;"KRAZEE KONG"
230 POSITION 5,6: ? #6;"PLEASE WAIT"
250 CHSET=(PEEK(106)-8)*256:CHORG=57344
260 IF PEEK(CHSET+9)<>0 THEN 340
270 FOR I=0 TO 511:POKE CHSET+I,PEEK(CHOR
G+I):NEXT I
280 FOR I=1 TO 14
290 CHPOS=CHSET+(ASC(CHAR$(I))-32)*8
300 FOR J=0 TO 7
310 READ A:POKE CHPOS+J,A
320 NEXT J:NEXT I
330 FOR I=32 TO 46:POKE CHSET+I,255-PEEK
(CHORG+I):NEXT I
340 POKE 756,CHSET/256

```

KRAZEE KONG

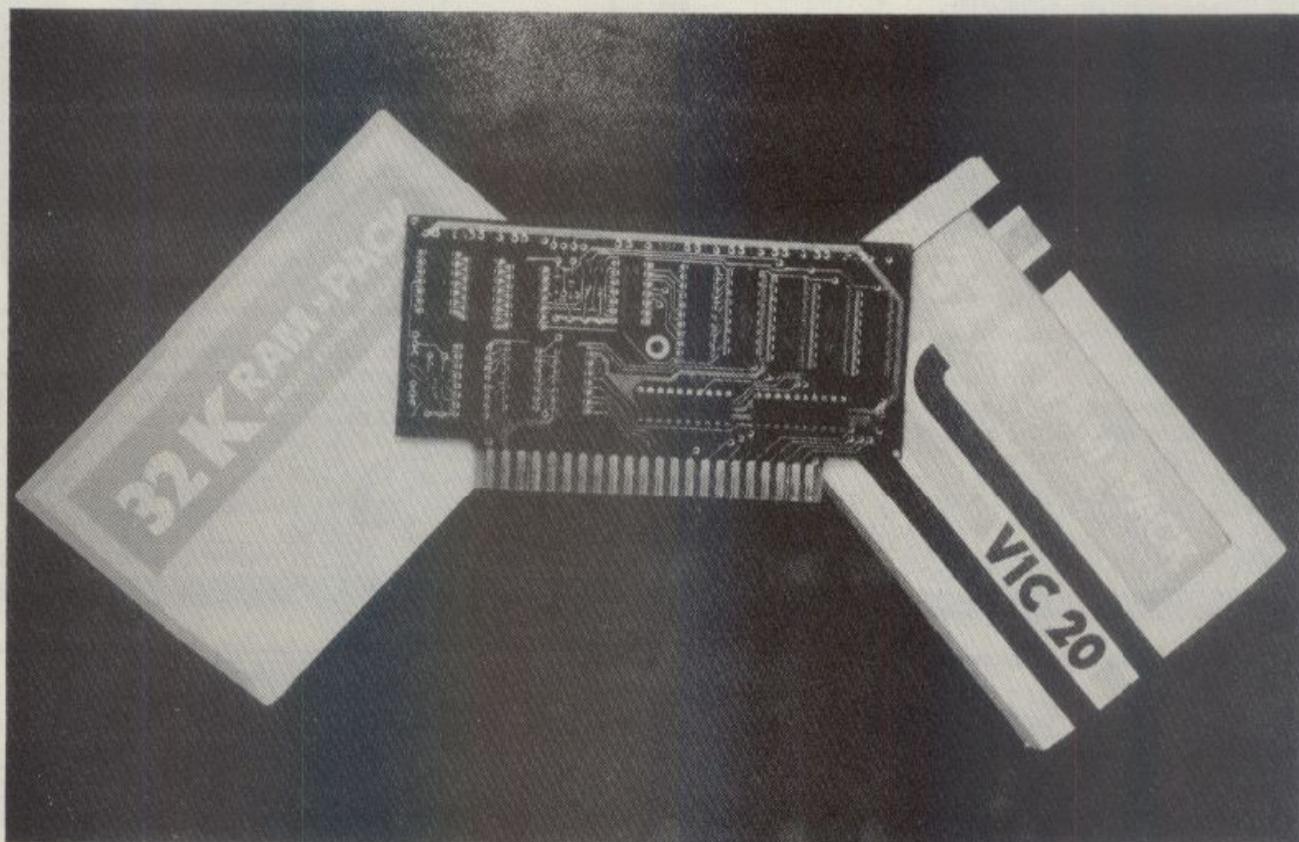
```

350 POSITION 5,4: ? #6; "          ": POSI
TION 5,6: ? #6; "LEVEL?       ": OPEN #1,4,0,
"K": GET #1, A: L=A-48: POSITION 5,6
360 COLOR 33+128: PLOT 1,1: COLOR 60+96: PL
OT 1,2: DRAWTO 12,2: COLOR 44: PLOT 6,0: COL
OR 46: PLOT 6,1
370 COLOR 60+96: PLOT 2,5: DRAWTO 13,5: PLO
T 1,8: DRAWTO 12,8: PLOT 1,11: DRAWTO 13,11
: COLOR 62+96: PLOT 13,2: DRAWTO 13,4
380 PLOT 1,5: DRAWTO 1,7: PLOT 13,10: DRAWTO
0 13,8: COLOR 35+128: PLOT 1,10: POSITION 1
4,0: ? #6; "KRAZEE": POSITION 14,1
390 ? #6; "KONG": POSITION 14,3: ? #6; "luca
s": POSITION 14,4: ? #6; "venter": POSITION
5,6: ? #6; "
395 RESTORE 410
400 FOR A=708 TO 712: READ B: POKE A,B: NEX
T A
410 DATA 22,100,56,8,13
420 COLOR 43+128: PLOT 0,10: COLOR 61: PLOT
0,11: COLOR 45+96: PLOT 10,1: PLOT 10,0: CO
LOR 60+96: PLOT 1,3: DRAWTO 2,3
430 PLOT 5,6: PLOT 10,6: DRAWTO 11,6: PLOT
4,9: PLOT 6,9: PLOT 10,9
440 LIVES=3: SCORE=0: DIM ABAR(4), BBAR(4),
PA(4), PB(4): RATE=1: X=1: Y=10: K=6: PK=6
450 RESTORE 460: FOR A=0 TO 4: READ B,C: AB
AR(A)=B: BBAR(A)=C: PA(A)=0: PB(A)=0: NEXT A
460 DATA 10,4,6,4,3,7,8,7,8,10
465 IF PEEK(53279)<>6 THEN 465
470 POSITION 14,8: ? #6; "lives": POSITION
14,10: ? #6; "score": POSITION 14,11: ? #6
: SCORE: POSITION 14,9: ? #6; LIVES
472 IF F=1 THEN LOCATE X,Y+1, POS: IF POS=
41 THEN SCORE=SCORE+1
473 IF Y=1 THEN 1000
474 IF SCORE>299 AND QF=0 THEN QF=1: LIVE
S=LIVES+1
475 COLOR 35+128: PLOT X,Y
476 IF SCORE>599 AND QF=1 THEN QF=2: LIVE
S=LIVES+1
477 IF SCORE>999 AND QF=2 THEN QF=0: LIVE
S=3: SCORE=0
480 FOR A=0 TO 4: COLOR 41
481 IF ABAR(A)<0 THEN ABAR(A)=0
482 IF ABAR(A)>13 THEN ABAR(A)=13
483 PLOT ABAR(A), BBAR(A): COLOR 0: PLOT PA
(A), PB(A)
484 NEXT A
490 FOR A=0 TO 4
495 PA(A)=ABAR(A): PB(A)=BBAR(A)
500 IF BBAR(A)=4 AND ABAR(A)>1 THEN ABAR
(A)=ABAR(A)-RATE: GOTO 560
510 IF BBAR(A)=4 AND ABAR(A)<2 THEN BBAR
(A)=7: ABAR(A)=2: GOTO 560
520 IF BBAR(A)=7 AND ABAR(A)<13 THEN ABA
R(A)=ABAR(A)+RATE: GOTO 560
530 IF BBAR(A)=7 AND ABAR(A)>12 THEN ABA
R(A)=12: BBAR(A)=10: GOTO 560
540 IF BBAR(A)=10 AND ABAR(A)>0 THEN ABA
R(A)=ABAR(A)-RATE: GOTO 560
550 IF BBAR(A)=10 AND ABAR(A)<1 THEN 580
560 NEXT A
570 SOUND 0,255,10,10: FOR Q=1 TO 2: NEXT
Q: SOUND 0,0,0,0: GOTO 660
580 SOUND 0,120,0,8
590 COLOR 0: PLOT K,0: PLOT K,1
600 B=SGN(X-K): K=K+1
610 IF K<2 THEN K=K+1
620 IF K>9 THEN K=K-1
630 COLOR 38: PLOT K,0: COLOR 39: PLOT K,1:
ABAR(A)=K: BBAR(A)=4: FOR Q=1 TO 7: NEXT Q
635 COLOR 44: PLOT K,0: COLOR 46: PLOT K,1:
SOUND 0,0,0,0
640 COLOR 43+128: PLOT 0,10
650 GOTO 560
660 ST=STICK(0): LOCATE X,Y, POS: BT=STRICK
(0): LOCATE X,Y-1, BPOS
665 IF POS=41 THEN 860
666 IF F=1 THEN 680
670 IF ST=15 AND BT=1 THEN 470
680 IF ST<>15 AND F=0 THEN 750
690 IF F=1 THEN CT=CT+1
700 IF CT=2 THEN COLOR 0: PLOT X,Y: F=0: CT
=0: Y=Y+1: GOTO 470
710 IF F=1 THEN 470
720 IF BPOS=60+96 OR BPOS=62+96 THEN 470
730 F=1: CT=0: Y=Y-1: ART=ART+L: IF (ART/30)
=INT(ART/30) THEN RATE=RATE+1
740 GOTO 470
750 COLOR 0: PLOT X,Y
760 IF ST=7 THEN X=X+1: LOCATE X,Y, POS: IF
X>13 THEN X=X-1: GOTO 470
763 IF ST=7 AND POS=62+96 THEN M1=X: M2=Y
765 IF ST=7 THEN 470
770 IF ST=11 THEN X=X-1: LOCATE X,Y, POS: I
F X<1 THEN X=X+1: GOTO 470
780 IF ST=11 AND POS=62+96 THEN M1=X: M2=
Y
790 IF ST=11 THEN 470
800 IF ST=14 THEN LOCATE X,Y-1, POS: IF PO
S<>62+96 THEN 470
810 IF ST=14 THEN Y=Y-3: COLOR 62+96: PLOT
M1, M2: GOTO 470
820 IF ST=13 THEN LOCATE X,Y+3, POS: IF PO
S<>62+96 THEN 470
830 IF ST=13 THEN Y=Y+3: IF Y+3=7 THEN X=
12: GOTO 470
840 IF ST=13 THEN IF Y+3=4 THEN X=2: GOTO
470
850 IF ST=13 THEN IF Y+3=1 THEN X=12: GOT
O 470
855 GOTO 470
860 LIVES=LIVES-1: RATE=1
870 COLOR 64: PLOT X,Y
880 FOR Q=1 TO 255: POKE 712, PEEK(53770):
SOUND 0,0,10,10: NEXT Q: POKE 712,13
890 SOUND 0,0,0,0
895 IF LIVES<>0 THEN 470
900 GRAPHICS 2+16
910 POSITION 8,4: ? #6; "GAME": POSITION 8,
6: ? #6; "OVER": POSITION 0,0: ? #6; "SCORE:"
: SCORE
920 IF PEEK(53279)<>6 THEN 920
930 RUN
1000 SCORE=SCORE+100
1010 COLOR 0: PLOT K,1: PLOT K,0: COLOR 64:
PLOT K,1: COLOR 35+128: PLOT 11,1
1020 FOR Q=0 TO 255
1030 SOUND 0,0,10,10: POKE 712, PEEK(53770
): NEXT Q: POKE 712,13: SOUND 0,0,0,0
1035 POKE 708,20: COLOR 0: PLOT 11,1: POKE
710,56
1040 X=1: Y=10: COLOR 35: PLOT X,Y: COLOR 44
: PLOT K,0: COLOR 46: PLOT K,1: GOTO 470

```

32K* RAM PACK FOR YOUR COMMODORE VIC20

SPECIAL OFFER



CHOOSE ANY **ONE** OF THE FOLLOWING 'GEMINI' SOFTWARE CASSETTES
REQUIRING 32K MEMORY EXPANSION:

- | | |
|--------------------------|-------------------------|
| 1 - DATA BASE MANAGEMENT | 4 - INVOICE STATEMENTS |
| 2 - STOCK CONTROL | 4 - HOME ACCOUNTS |
| 3 - MAILING LIST | 6 - COMMERCIAL ACCOUNTS |

AND ADD A 32K RAM PACK BY PLUS 80 (rrp £69.95 for both) **ONLY £59.99** (incl)

PLUS 80 LTD
31-33 LOWER ROAD
HARROW
MIDDX HA2 0DE
01-423 6393

(Generous dealer discounts)

*Gives 28159 bytes

ALLOW 10-14 DAYS DELIVERY

NAME

ADDRESS

32K RAM PACK with Software

1 2 3 4 5 6

32K RAM PACK on its own at £49.99

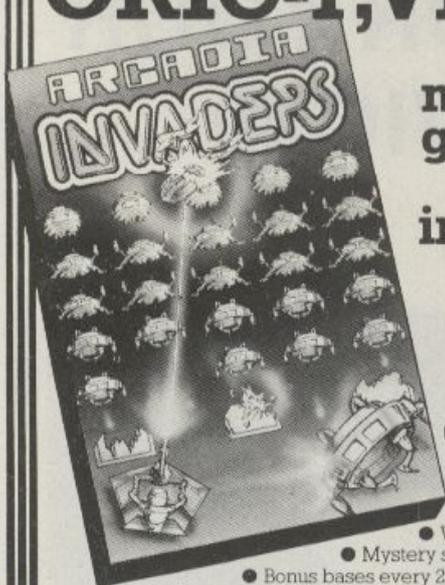
SOFTWARE on its own at £19.95

1 2 3 4 5 6

16K RAM PACK at £37.99

I ENCLOSE CHEQUE/PO FOR £

ORIC-1, VIC-20



The meanest game of space invaders you'll ever play!

only **£5.50**

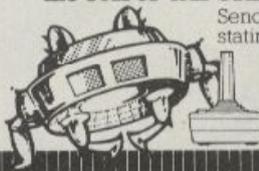
FEATURES

- Three invader types
- Written in machine code
- Mystery scoring mother ships
- Bonus bases every 2000 points
- High score register
- Full sound effects and colour

You must defend earth from the hordes of bomb dropping space invaders, using your earth bound laser base. The more invaders you hit, the faster they come - leading to a gun-blazing shoot-out as finale.

A great shoot-'em-up, all action arcade game, for the 16K or 48K ORIC-1 or unexpanded VIC-20.

Send cheque or P.O. for £5.50 (postage paid), stating computer type and memory size to:-



ARCAOTIA SOFTWARE

FREEPOST, SWANSEA, SA3 4ZZ

MUSHROOM MANIA

For the 16K or 48K
ORIC-1

So fast, it'll take your breath away!

only **£5.50**

FEATURES

- Written entirely in MACHINE CODE
- Over 80 skill levels
- Random scoring spiders
- One or Two Player Option
- Hall of Fame
- Full colour and sound
- Bonus lives every 12000 points
- Deadly PACPERSON attacks



Blast the fast moving centipede, as it snakes down towards you, in the depths of the green forest. Score points by shooting-up mushrooms and the deadly spiders. But beware of the hungry PACPERSON, which will gobble anything in its path. The higher your score rises, the faster the action becomes, until it is only a screaming blur of colour and sound.

Send cheque or P.O. for £5.50 (postage paid), stating computer type and memory size to:-



ARCAOTIA SOFTWARE

FREEPOST, SWANSEA, SA3 4ZZ



ORIC-1

SOFTWARE
~ SPACE INVADERS ~

WRITTEN TOTALLY IN MACHINE CODE
EXCELLENT COLOUR GRAPHICS &
SMOOTH MOVEMENT OF INVADERS, BASE.

FEATURES INCLUDE 1 OR 2 PLAYERS
BONUS BASES, SPINNING SPACE SHIP,
5 ROWS OF INVADERS, SKILL LEVELS,
SOUND, HI-SCORE, HALL OF FAME.

£5.95 INCLUSIVE, NO EXTRAS

PRO SOFTWARE ORIC

121 IYN Y IWR
BAGLAN
PORT TALBOT
WEST GLAMORGAN
SA12 8YE
MAIL ORDER ONLY

MP

B.B.C. MICRO SOFTWARE

THREE GREAT ADVENTURE GAMES

BLUE DRAGON 'NEW' — Somewhere in a strange and dangerous land lies a fabulous treasure guarded by a fierce dragon. Can you survive the perils that await and recover the treasure or will you meet a nasty end!! What is making terrible slurping noises deep underground? And what use is the strange black cloud? Play the game and find out.

SURVIVOR — The year is 1910. You are sailing on a steamer bound for Borneo when there is an explosion and the ship sinks. Shipwrecked on a tropical island, can you survive and escape back to civilization or will you end up in someones cooking pot!! There is more than one ending to this game, not all of them bad!

FIREWOOD — An evil wizard has captured the magic Golden Bird of Paradise and imprisoned it in a weird castle in the middle of the enchanted Firienwood. Your quest is to find the bird and set it free, in return the bird will give you health and prosperity. Beware! Many perils lie before you and every move is fraught with danger!!

Each game is priced at £7.48 on cassette or £10.50 on disc
All the games are text only and written in machine code for high speed. They require 32K and run on all operating systems. Prices include VAT & postage within U.K. Send S.A.E. for full range of programs and price list or ask your local dealer. Trade enquiries welcome.

ALL PRICES INCLUDE POSTAGE: CHEQUES AND POSTAL ORDERS PAYABLE TO:
"M P SOFTWARE"

MP

SOFTWARE & SERVICES

165 Spital Road, Bromborough, Merseyside L62 2AE
TELEPHONE: 051 334 3472

GUARANTEED!

Your cassette loading and saving problems eliminated

First of an entirely new style of data cassette recorder specially designed for use with microcomputers.



£49.95
incl. VAT & p&p

SPECIAL OFFER
All data recorders ordered will be supplied with a mains power supply—FREE!

Just arrived — the first shipment of the remarkable PYE D6600 with the following impressive features:

- Remote socket for direct microcomputer control.
- Backed by the international Pye Organisation.
- High quality electronics and finish.
- Compact size (only 115 x 32 x 187mm).
- Pushbuttons for ease of operation.
- Tone control and automatic stop.
- Review and cue facility.
- Three digit tape counter with zero-reset button.
- Automatic recording level control.
- Electronic tape speed control.
- Envelope-type cassette cover.
- One-finger record operation (for non-computer use).
- LED recording/battery level indicator.
- Mains or battery operation.

We guarantee

1. 7 day money back guarantee if not completely satisfied.
2. 12 months warranty on parts and labour.
3. No money will be banked until the goods are ready for dispatch.

ORDER FORM

Please supply Pye D6600 automatic data recorders microcomputer.
at £49.95 each, for my microcomputer.

I enclose a cheque for *
Debit my Access a/c with £

Access No. Expiry Date

Signed

Name

Address

..... Postcode

Send to: Veltomax Limited, Norbury House, Norbury Crescent,
Hazel Grove, Stockport, Cheshire.

Please allow 28 days for delivery. Dept PCT * Delete if not applicable.

DON'T MISS THIS INCREDIBLE OFFER! 50 GAMES £9.95!

CASSETTE 50 FOR YOUR MICRO



GALACTIC ATTACK
SPACE MISSION
LUNAR LANDER
PLASMA-BOLT
STARTREK
RADAR LANDING
ATTACKER
GALACTIC DOGFIGHT
ZION ATTACK
IVASIVE ACTION
OXO
BOGGLES
PONTON
SKI JUMP
HANGMAN
OLD BONES
THIN ICE

MAZE EATER
ORBITTER
MOTORWAY
FORCE FIELD
NIM
TUNNEL ESCAPE
BARREL JUMP
CANNONBALL BATTLE
OVERTAKE
SITTING TARCET
SMASH THE WINDOWS
SPACE SHIP
JET FLIGHT
PHASER
INTRUDER
INFERNO
GHOSTS

SUBMARINES
ROCKET LAUNCH
PLANETS
BLACK HOLE
DYNAMITE
DO YOUR SUMS
DERBY DASH
SPACE SEARCH
UNIVERSE
RATS
TANKER
PARACHUTE
JETMOBILE
HIGH RISE
THE FORCE
EXCHANGE



UTS SOFTWARE

NOW AVAILABLE FOR

sinclair VIC-20

SPECTRUM LYNX

ZX81 ORIC-1

DRAGON ATARI

apple (ON DISC & CASSETTE) BBC A/B

WE BUY GAMES — CONTACT US NOW



DIRECT MAIL ORDER FORM

SUPPLY CASSETTE 50 FOR COMPUTER

I enclose cheque/P.O. payable to U.T.S.

Name

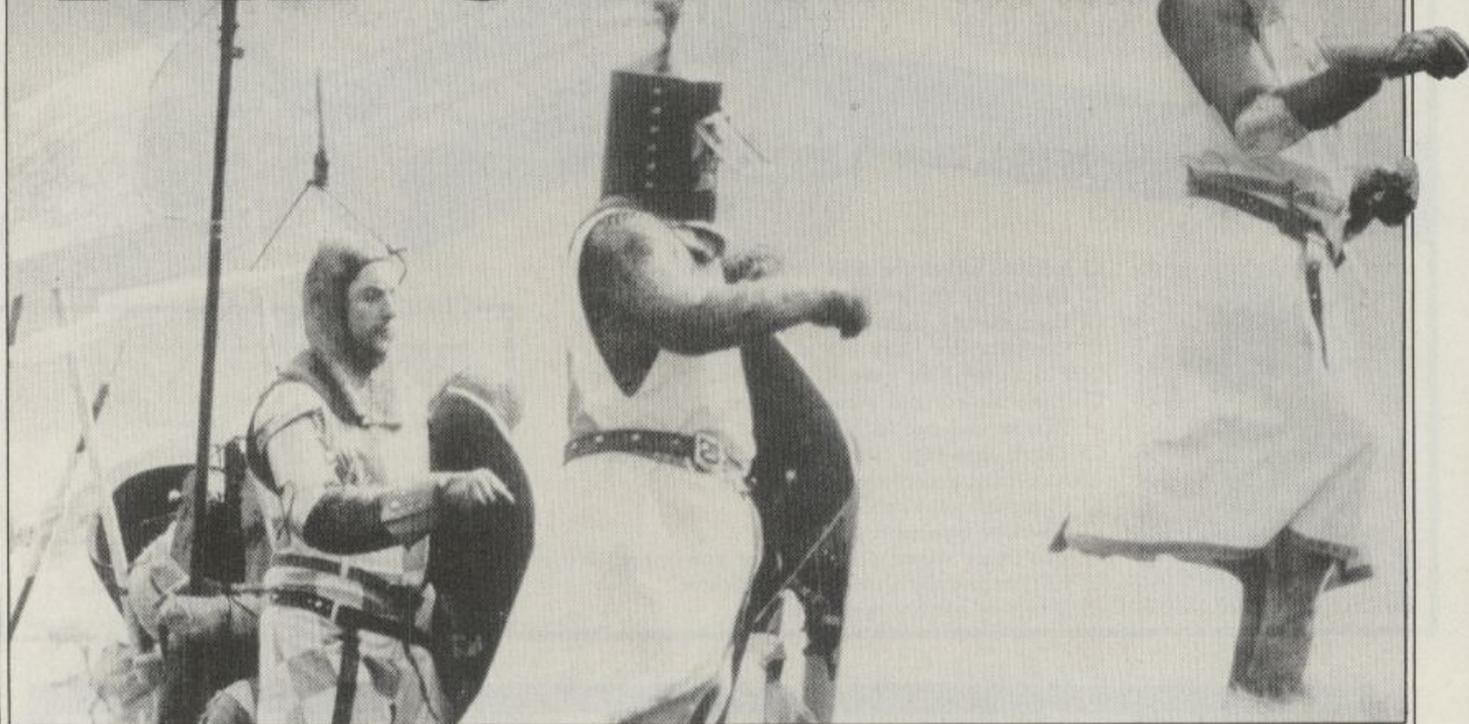
Address

Mail Order Only PCT

U.T.S.
P.O. Box 96
53 Lincoln Grove,
Harrogate,
N. Yorks HG3 2UZ

only £9.95
inc. V.A.T. & Post & Packaging

THE CITADEL



Program your VIC 20 to run this mammoth adventure game from M. B. Dhun.

The Kingdom of Juliana has been over-run by a horde of brigands. They have made the Citadel their stronghold and from time to time marauding bands roam the Kingdom just spoiling for a fight.

The exiled King has called upon his brother, the ruler of neighbouring Katiera and as a result you have been dispatched to restore the kingdom by defeating the brigands in the Citadel.

The Kingdom consists of eight open plains and the Citadel itself. Your quest starts on an open plain with the Citadel due South of you, but before you can gain entry to the Citadel you must first find the 3 keys to unlock a secret door.

You start with 10 warriors, 30 bags of gold and 25 bags of rations. At the end of each of your moves your rations will decrease in relation to the number of warriors you have. If you run out of rations then some warriors are bound to die of starvation.

Gold is a useful commodity,

as you can buy warriors and rations at the Bazaar. Each warrior can only carry a maximum of 6 bags of gold and you will lose any excess gold that you have.

The Bazaar owner is a cantankerous soul and is selective in what he offers for sale at each visit, he may even close the Bazaar if he feels like it. Other goods which may be purchased, when on offer, are a Mule, which can carry 50 bags of gold, a Guide who will prevent you from getting lost in uncharted territories and a Healer, who can cure the plague that falls from time to time.

On the Plains

On the open plains you can suddenly become lost, the plague can fall, you may be cursed by a Wizard or a Dragon may attack. In all these eventualities your warriors, gold or rations could be depleted, unless you have a Guide, Healer, Warlock or Magic Sword,

which guard against these happenings and also reap benefits of extra warriors, rations or gold.

Bands of Brigands may attack you on the plains or even when you enter the Tomb or the Ruin. Useful items can be found in the buildings, even if they were empty on a previous visit (Brigands tend to move things around) and are also awarded as 'booty' when you defeat a band of brigands. You may fight or retreat when the brigands attack, but you will lose warriors in a retreat.

When you have found the 3 keys your troubles are not over. You must regain the Citadel and use the keys in the correct order to gain admittance. Once inside the remaining Brigands will attack and have to be defeated.

Keep an eye on your Inventory, which is produced at the start of each move. If you run out of warriors or you are unable to pay for goods purchased then you have failed.

PROGRAM LISTING

```

READY.
2 POKE36879,25:W=10:G=30:R=25:Y#=" YOU HAVE FAILED IN YOUR QUEST"
3 I#="BUYING V/?":J#=" YOU ARE ON A PLAIN"
4 DH=2:DG=4
7 POKE36869,242
8 X=2
9 PRINT" "
90 PRINT"X/?/I/?/":PRINT"ARRIORS"#:IFW=1THENPRINT" ","ARRLOCK"
91 PRINT"ATIONS"#:IFHH=1THENPRINT" ","EALER"
92 PRINT"OLD"#:IFGG=1THENPRINT" ","UIDE"
93 PRINT"EYS"#:IFMM=1THENPRINT" ","ULE"
94 IFSS=1THENPRINT"AGIC WORD"
96 PRINT
100 PRINT"WHICH WAY?"
101 IFX=2THENPRINT"HE ITADEL IS DUE SOUTH"
102 GETZ#:IFZ#=""THEN102
103 GOTO700
104 PRINTJ#
106 GOTO900
120 IFW<0THENR=R-1
121 IFW>15THENR=R-1
122 IFW>30THENR=R-1
123 IFW>45THENR=R-1
124 IFW>60THENR=R-1
125 IFW>75THENR=R-1
126 IFW>90THENR=R-1
127 IFR<0THENR=0
128 IFR<1THENW=W-2:PRINT"UT OF AIONS":PRINT"2 ARRIORS STARVE"
130 IFR<1THENPRINT" /0 ARRIORS LEFT":PRINTY#:GOTO1000
131 YY=YY+25
132 PRINT:GOTO90
140 PRINT"HERE IS A ANCTUARY":PRINT"IO IN V/?"
141 GETK#:IFK#=""THEN141
142 IFK#="N"THEN200
143 IFK#="Y"THENI=INT(RND(1)*4)+4:GOTO145
144 GOTO141
145 PRINT"LECRUIT"+2"ARRIORS":PRINT"ATHER"+1"ATIONS":PRINT"IVEN"+I"AGS OF
OLD"
146 W=W+T+2:IFW>99THENW=99
147 R=R+T+1:IFR>99THENR=99
148 G=G+T:IFG>W*6+MM*50THENG=W*6+MM*50
152 IFK=3THENPRINT"URTHER LECRUITS":W=W*2:IFW>99THENW=99
153 GOTO120
160 PRINT"HERE IS A AZAAR":PRINT"IO IN V/?"
161 GETX#:IFX#=""THEN161
162 IFX#="N"THEN200
163 IFX#<"Y"THEN161
164 T=INT(RND(1)*5)+1:U=INT(RND(1)*3)+1:J=INT(RND(1)*5)+6
165 ONT GOTO174,192,216,238,258
174 PRINT"OR SALE AIONS":PRINTU"AGS OF OLD PER UNIT":PRINTI#
175 GETA#
176 IFA#="N"THEN120
177 IFA#<"Y"THEN175
182 PRINTU"AGS OF OLD EACH":PRINT"OW MANY":INPUTPP
184 G=G-U*PP:R=R+PP:GOTO187
186 G=G-J*U
187 IFG<0THENPRINT"IAZAAR OWNER KILLS YOU FOR NOT BEING ABLE TO PAY":PRINTY#:G
OTO1000
188 GOTO920
192 PRINT"OR SALE U"ARRIORS":PRINTJ"AGS OF OLD":PRINTI#
194 GETB#
195 IFB#="N"THEN120
196 IFB#<"Y"THEN194
202 PRINT"WHAT WILL BE"+J*U"AGS"
204 PRINT"AGREE THE PRICE V/?"
206 GETC#
207 IFC#="Y"THEN186
208 IFC#<"N"THEN206
210 L=INT(RND(1)*2)+1
212 IFL=1THENPRINT"IAZAAR LOSED":GOTO120
213 J=J-1:IFJ<1THENL=1:GOTO212
214 PRINT" THEN"+J*U"AGS":GOTO204
216 IFMM=1THENL=1:GOTO212
218 PRINT"OR SALE ULE"+J"AGS":PRINT"AN CARRY 50 AGS OF OLD":PRINTI#
224 GETD#
225 IFD#="N"THEN120

```

PROGRAM LISTING

```

226 IFD#<"Y" THEN 224
228 U=1:GOTO204
238 IFG=1 THEN L=1:GOTO212
240 PRINT"FOR SALE |UIDE"J" |AGS OF GOLD. /EVER GET LOST":PRINTI#
242 GETE#
243 IFE#="N" THEN 120
244 IFE#<"Y" THEN 242
245 U=1:GOTO204
258 IFHH=1 THEN L=1:GOTO212
260 PRINT"FOR SALE |EALER"J" |AGS OF |OLD. /EVER FALL ILL":PRINTI#
262 GETF#
263 IFF#="N" THEN 120
264 IFF#<"Y" THEN 262
265 U=1:GOTO204
280 J=INT(RND(1)*12)+1
282 IFJ=1 THEN 302
284 IFJ=3 THEN 308
286 IFJ=5 THEN 318
288 IFJ=7 THEN 313
290 IFJ=9 THEN 325
291 PRINT"ALL CLEAR. /O DANGER"
300 REM
301 GOTO120
302 PRINT"UNCHARTED |ERRITORY"
303 IFG=1 THEN PRINT"DU HAVE A |UIDE":PRINT" |AIN 2 oARRIORS":W=W+2:IFW>99 THEN W=
99
304 IFG=1 THEN 120
305 PRINT" /O |UIDE":PRINT"LOSE 2 oARRIORS":W=W-2:GOTO120
308 PRINT"LAGUE AREA"
309 IFHH=1 THEN PRINT"DU HAVE A |EALER":PRINT" |AIN 2 oARRIORS":W=W+2:IFW>99 THEN
W=99:GOTO120
310 IFHH=1 THEN 120
311 PRINT" /O |EALER. 2 oARRIORS DIE":W=W-2:GOTO120
313 PRINT" |HIS AREA -CURSED"
314 IFWW=1 THEN PRINT"DU HAVE A oARLOCK CURSE FAILS. |AIN 2 oARRIORS":W=W
+2:IFW>99 THEN W=99
315 IFWW=1 THEN 120
316 PRINT" /O oARLOCK. LOSE 1/4 OF |OLD":G=3*G/4:G=INT(G):GOTO120
318 PRINT"RAGON ATTACKS"
319 IFSS=1 THEN PRINT"DU HAVE THE *WORD SLAY -RAGON":PRINT" -APTURE"DW"oARRIO
RS AND"DG
320 IFSS=1 THEN PRINT" |AGS OF |OLD"
321 IFSS=1 THEN G=G+DG:W=W+DW:DW=4:DG=2:IFW>99 THEN W=99:IFG>W*6+MM*50 THEN G=W*6+MM*
50
322 IFSS=1 THEN PRINT"LOSE SWORD":SS=0:GOTO120
323 PRINT" /O *WORD. LOSE 1/4 OF |OLD AND oARRIORS":DG=DG+G/4:DW=DW+W/4:DG=INT(
DG)
324 DW=INT(DW):G=3*G/4:G=INT(G):W=3*W/4:W=INT(W):GOTO120
325 J=INT(RND(1)*W)+INT(RND(1)*W)+1
326 PRINT"J" |RIGANDS ATTACK":PRINT" DU HAVE"W"oARRIORS":PRINT" |IGHT OR |ETREA
T _/_?"
327 GETG#
328 IFG#="R" THEN W=W-2:PRINT"LOSE 2 oARRIORS IN THE RETREAT":GOTO120
329 IFG#="F" THEN 336
330 GOTO327
336 P=INT(RND(1)*6)+1:Q=INT(RND(1)*7)+3
338 W=W-P:J=J-Q
340 IFK<1 THEN 130
342 IFJ<1 THEN PRINT"LOSE"P"WARRIORS IN THE BATTLE":GOTO360
343 PRINT"LOSE"P"WARRIORS IN THE BATTLE":PRINT"BRIGANDS DEAD"
344 PRINT"*KIRMISH OVER"
345 IFW-J>3 AND W<20 THEN PRINT"WELL DONE. CAPTURE"J"MEN"
346 IFW-J>3 AND W<20 THEN PRINT" |HEY WILL FIGHT WITH YOU":W=W+J:GOTO360
347 GOTO326
360 IFK=3 AND Q=1 THEN PRINT" |WELL DONE":PRINT"QUEST COMPLETED":GOTO1000
362 J=INT(RND(1)*8)+1
364 IFJ=1 OR J=3 THEN 372
366 IFJ=2 OR J=7 THEN 376
368 IFJ=4 OR J=5 THEN 380
370 IFJ=6 OR J=8 THEN 384
371 GOTO390
372 IFSS=1 THEN 390
374 SS=1:PRINT" |LEWARD - \MAGIC *WORD /ILLS -RAGONS":GOTO390
376 IFWW=1 THEN 390
378 WW=1:PRINT" |LEWARD - oARLOCK":PRINT" |ROTECTS FROM CURSE":GOTO390

```

THE CITADEL

PROGRAM LISTING

```

380 IFK=3THEN390
382 K=K+1:PRINT"DO YOU HAVE NOW FOUND"K" KEYS":GOTO390
384 PRINT"RAIN 2 RECRUITS":W=W+2:IFW>99THENW=99
390 J=INT(RND(1)*10)+1
392 IFJ=5THENPRINT"NO I OLD FOUND":GOTO120
394 G=G+4:PRINT"BLIND 4 BAGS OF IOLD":GOTO120
400 PRINT"HERE IS A IOMB":PRINT"IO IN V/"
401 GETU#
402 IFU#="N"THEN280
403 IFU#<"Y"THEN401
404 GOTO410
405 PRINT"HERE IS A RUIN":PRINT"IO IN V/?"
406 GETV#
407 IFV#="N"THEN200
408 IFV#<"Y"THEN406
410 J=INT(RND(1)*3)+1
420 IFJ=2THEN325
422 GOTO362
432 PRINT"-ITADEL. USE THE KEYS IN THE CORRECT ORDER"
433 IFZZ=1THEN442
434 J=INT(RND(1)*6)+1:ZZ=1
436 IFJ=1THEN0#="BS0"
437 IFJ=2THEN0#="B0S"
438 IFJ=3THEN0#="G0B"
439 IFJ=4THEN0#="G0S"
440 IFJ=5THEN0#="S0G"
441 IFJ=6THEN0#="S0B"
442 E=1
443 PRINT"THE KEYS ARE IOLD. SILVER AND IRASS."
444 PRINT"WHICH KEY - I, S OR I":INPUTH#
446 IFH#=MID$(0#,E,(1))THENE=E+1:GOTO450
448 PRINT"GO L/I":PRINT"YOU ARE BACK ON THE PLAIN. THE CITADEL IS DUE SOUTH":
X=2:GOTO120
450 JFE>3THEN00=1:GOTO325
460 PRINT"WRORRECT":GOTO444
700 IFX=1ANDZ#<"N"THEN710
701 IFX=3ANDZ#<"W"THEN710
702 IFX=4ANDZ#<"W"THEN710
703 IFX=7ANDZ#<"S"THEN710
704 IFX=9ANDZ#<"E"THEN710
705 IFX=8ANDZ#="S"THEN710
706 IFX=6ANDZ#="W"THEN710
707 IFX=5ANDZ#="N"THEN710
708 IFX=2ANDZ#="S"ANDK<3THENPRINT"YOU NEED 3 KEYS TO ENTER THE -ITADEL":GO
T0100
709 GOTO104
710 PRINT"CAN'T GO THAT WAY":GOTO100
900 IFX=2ANDZ#="N"THENX=5:GOTO917
901 IFX=2ANDZ#="S"THENX=1:GOTO917
902 IFX=2ANDZ#="E"THENX=3:GOTO917
903 IFX=2ANDZ#="W"THENX=8:GOTO917
904 IFX=3THENX=2:GOTO917
905 IFX=4THENX=5:GOTO917
906 IFX=5ANDZ#="E"THENX=4:GOTO917
907 IFX=5ANDZ#="W"THENX=6:GOTO917
908 IFX=5ANDZ#="S"THENX=2:GOTO917
909 IFX=6ANDZ#="N"THENX=7:GOTO917
910 IFX=6ANDZ#="S"THENX=8:GOTO917
911 IFX=6ANDZ#="E"THENX=5:GOTO917
912 IFX=7THENX=6:GOTO917
913 IFX=8ANDZ#="N"THENX=6:GOTO917
914 IFX=8ANDZ#="E"THENX=2:GOTO917
915 IFX=8ANDZ#="W"THENX=9:GOTO917
916 IFX=9THENX=8
917 ONXGOTO432,280,160,400,280,280,140,280,405
920 IFT=2THENW=W+U
921 IFT=3THENMM=1
922 IFT=4THENGG=1
923 IFT=5THENHH=1
924 GOTO120
1000 PRINT:PRINT"OUR SCORE IS"
1010 SC=YY+50*(GG+HH+MM)+1000*K+1500*E+50*(G+R+W)
1020 PRINT:PRINTSC
1030 PRINT:PRINT"IT ANY KEY"
1040 GETZZ#:IFZZ#=""THEN1040
1050 CLR:GOTO2

```

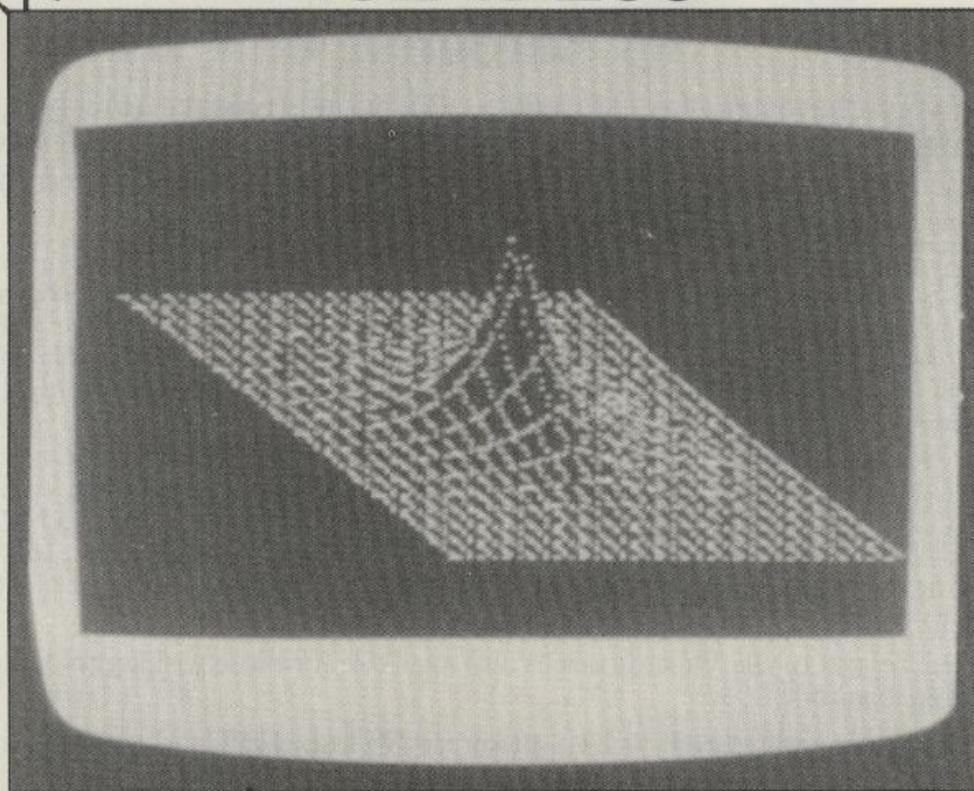

**EASY
TO USE**

**16 K
ZX - 81**

FAST

**NO
HARDWARE
REQUIRED**

**HIGH
RESOLUTION
192 x 256**



ACTUAL SCREEN DISPLAY

The Tool Box has 8 Hi-Res Commands including:

PRINT, PLOT, INVERT, HI RES SAVE + HI RES LOAD

There is an extensive, easy to follow manual, illustrated with program examples, on tape as well as the toolbox are two demonstration programs, 'sine waves' and the "3D Exponential Graph" (seen above) which make it easier for you to master the simple principles of Hi-Res programming.

ONLY £5.95

Available from **JOHN MENZIES & PRISM MICROPRODUCTS** Dealers. If you can't find a copy send a cheque or P.O. to.

C.R.L. Dept PCT
140 WHITECHAPEL ROAD, LONDON E1
or TELEPHONE 01-247 9004

DEALER ENQUIRIES WELCOME

TECHNICAL ENQUIRIES

MICROANSWERS is Personal Computing Today's Technical Enquiries Service. Each month we will endeavour to answer your questions on the subject of micro-computing. We would love to hear of your problems (honest!) as it is certain that if you are having trouble then other users of your machine will also be suffering.

So here's your chance to lighten your burden by sharing your troubles with Personal Computing Today's panel of experts.

Address your letters to:

"Micro Answers"

Personal Computing Today

ASP Ltd

145 Charing Cross Road

London WC2H 0EE

If you wish a personal reply, please enclose a stamped addressed envelope and the reply coupon from this page. This is to enable us to give priority to regular readers of PCT.

Dear PCT

I would be very grateful if you could help me with the following problems.

I own a VIC 20, not expanded. When I use it for about two hours I find that there's a black (sometimes white) cursor on the screen in memory location 7872. It appears in the same position every time. At first I thought it because of the mono TV, but after I had tried it on a colour TV the same thing happened.

The cursor doesn't blink, its like a rectangle on the screen. It disappears when I either clear the screen or when something touches it (for instance, during the course of a game), but it appears again after a few seconds.

Could you please tell me what's wrong with it. Is there anything wrong with the VIC. I hope not because I only bought it from Boots before Christmas!

I have a problem when I use the GET statement e.g. Hit F1 to play. When I pressed the RUN-STOP button it says: Break in (Line Number).

Is there a statement I could add on to the program so it would ignore the RUN-STOP and only run when F1 is pressed.

Finally, I am thinking of buying a Super Expander cartridge for its high resolution graphics but it only contains an extra 3K of memory. I would also like to buy a 16K RAM pack. Is there a cartridge available which has both the things I need. I can't afford a memory expansion board yet.

Thank you for your help.

Yours faithfully,

S.Y. Low

Greater Manchester

Your VIC sounds like it is suffering from an overheating problem. The likeliest cause of this particular effect is that one bit, of one byte of the RAM which supplies memory to the screen is adopting a 'high' state when a certain temperature is reached. To repair this it is only a case of replacing the RAM chip which contains the video memory. Unfortunately this job should only be carried out by a qualified service engineer and should not be attempted by yourself. Take the computer back to the store where you bought it and they will be able to get it serviced.

There is nothing unusual about the action of the RUN/STOP key, that is what it is there for. As for disabling it, I couldn't find a POKE or a routine to do this. So if anyone out there knows

of a way to disable the VIC's RUN/STOP key, drop us a line at Micro Answers and we will print it.

In answer to your final question I think you would do well to check out the Stack range of memory expansions and ROM based toolkits. This range will enable you to put together a 16K unit which includes a high resolution capability.

Dear PCT

Can you help me? In your 1982 December issue you had a program for the VIC 20. After programming it in I found out it needed the 3K expander. So I just left it. Now I have purchased a 3K expander. I then programmed it in checking every line as I went. When I finally reached the end I ran it, it said SYNTAX ERROR in 930. I checked this line, it was correct. So I checked all the program again. It was correct. Line 930 is listed below:

```
930 P(A) = CP:M(A) = CM:0(A) = FS:POKE CP8
CS:NEXT A
```

Could you please tell me what is going wrong.

J. Rogers

Sorry, our fault this one. When the program was typeset an O in that line got changed to a 0 (zero). So in fact the third statement in that line should read O(A) = FS, and not 0(A) = FS. The reason that this caused the syntax error is that the VIC (or any other computer that I know of) will not allow you to start a variable name with a numeric. It is alright to suffix the variable name with a number, for instance A3, B9. Sorry again for the mistake and I hope you will now be able to complete what is a fun program.

Dear PCT

Being a newcomer to the computing 'bug', I would like to ask a couple of questions.

As Atari computers have been modified to run on our voltage and frequency, does any modification have to be carried out on the software as well?

Bearing in mind that I would like to buy a computer to get to grips with programming, playing games and some business applications, which would be better — an Atari 400 + BASIC or the Lynx?

Yours faithfully

A. Malden

Bury St. Edmunds

Atari computers are in fact manufactured for use in England and do not need any modification. As far as a piece of software is concerned there is no difference between English and an American Atari. All English Atari's are equipped with an uprated graphics chip known as the GTIA. This offers the programmer an extra three graphics modes. As far as I am aware there is no commercially available software which makes use of this chip's facilities. To conclude, you should have no problem getting American software to run on your Atari computer, provided of course that you have the correct amount of memory.

With respect to your second query, we try not to give advice in Micro Answers about which machines to buy, so please, no more letters asking us to make your decision for you. However what we can do is highlight certain aspects of machine in the hope of making your decision easier.

With a view to playing games, there are few machines available which can surpass the Atari for choice and quality of games software. Atari's expertise in producing games machines has made their computers the easiest to use in both roles.

Choosing a computer for programming is more difficult. Two points you should consider are whether the machine you choose will let you fully explore the art of programming by having either a comprehensive BASIC built in or the facilities to extend the BASIC or even move on to a higher language. Secondly, if you are a raw beginner you should check the manual to see whether you can understand it and if not find out if there are any books available which will provide for the points which the manual doesn't.

Dear PCT

I recently salvaged an old 8-bit Telex-coded teleprinter in good condition and would like to interface it to a BBC 'B' with the intention of using it for letter quality printing (it has individual hammers). Whilst this idea may sound a little eccentric I would say that I am serious about this project and am prepared to put in a good deal of work. In fact, I will have to clean and restore the machine to working order first!

Therefore, I wonder if you could help me in a number of ways. I would say I have a reasonable grasp of basic principles on the BBC Micro, and accept that much assembly language programming will have to be learnt, so could you recommend a book or books which would assist me in the area of printer interfacing from scratch.

Secondly is there a source of information on the operating principles of such Telex printers that are available. Lastly, the machine is called 'FRIDEN' and I wonder if it would be possible to find out more about the particular machine system and its uses or limitations. I have tried to find a company and failed.

I realise this may be a tall order but any information you could give me would be gratefully received.

Your faithfully,
Michael Kidd
London

Not such a tall order this one. It just so happens that Personal Computing Today's sister magazine, Computing Today, ran a two-part article on using teleprinters with computers. The articles appeared in the December 1982 and the January 1983 issues of Computing Today.

The articles give details on how the teleprinters work, how to interface them and how to write the software to drive them. There is only one problem, both the articles are based around the NASCOM microcomputer. Not to worry, they contain a lot of essential information about teleprinters and should tell you virtually all you need to know about starting your own project on the BBC.

A useful book to buy to help with the conversion onto the BBC is 'The BBC Micro - an expert guide'. This book has been written by Mike James and is published by Granada, costing £6.95. The book covers advanced aspects of the BBC and includes chapters on interfacing and assembly language programming.

PROGRAM CORRECTIONS

In last month's issue we noticed that a few characters had crip off of the Atari Silver Surfer program. Here are the corrections you need to make in order to get the program running.

- Lines 60-97: POKE N+D+ should be changed to POKE M+N+
- Lines 140, 170, 200: These should read FOR N=1 TO 10
- Line 280: The start of this line should read IF MAN < 400
- Line 5010: The star of this line should read IF D=7 AND MAN < 400
- Line 5020: The start of this line should read IF D=11 AND MAN > 0
- Lines 6010 & 7010: These should start PRINT # 6

PRIORITY REPLY

August 1983 Issue

Personal Computing Today Reader Enquiry Service

Name

Address

.....

.....

.....





QUEST FOR ANY SPECTRUM

SIMPLY THE BEST

THE BLACK HOLE

THE SCENE: Alien spacecraft are using hyperspace drive to enter our universe through a black hole. Their intent is destruction.

YOUR MISSION: To uphold the defence of your universe as long as possible while inflicting the maximum damage on alien forces.

YOUR WEAPONS: Positive and Negative Ion Guns are deadly at any range but the ion stream is bent by the massive gravitational field of the black hole. The Neutron Blaster is equally deadly but has only limited range.

YOUR BATTLE: You are under constant attack from the alien force which pits fiendish offence craft against you in ever increasing intensity, in deadlier and deadlier form.

How long can your fleet of ships survive? How many enemy craft can you destroy? 100% super efficient machine code allows all this action to be packed in to run on the 16K (or 48K) Spectrum. Superb animation, high resolution graphics, incredible explosive and full sound effects combine to make "Black Hole" set a new standard in Spectrum software.

Also features a special learning mode to help develop your skills.

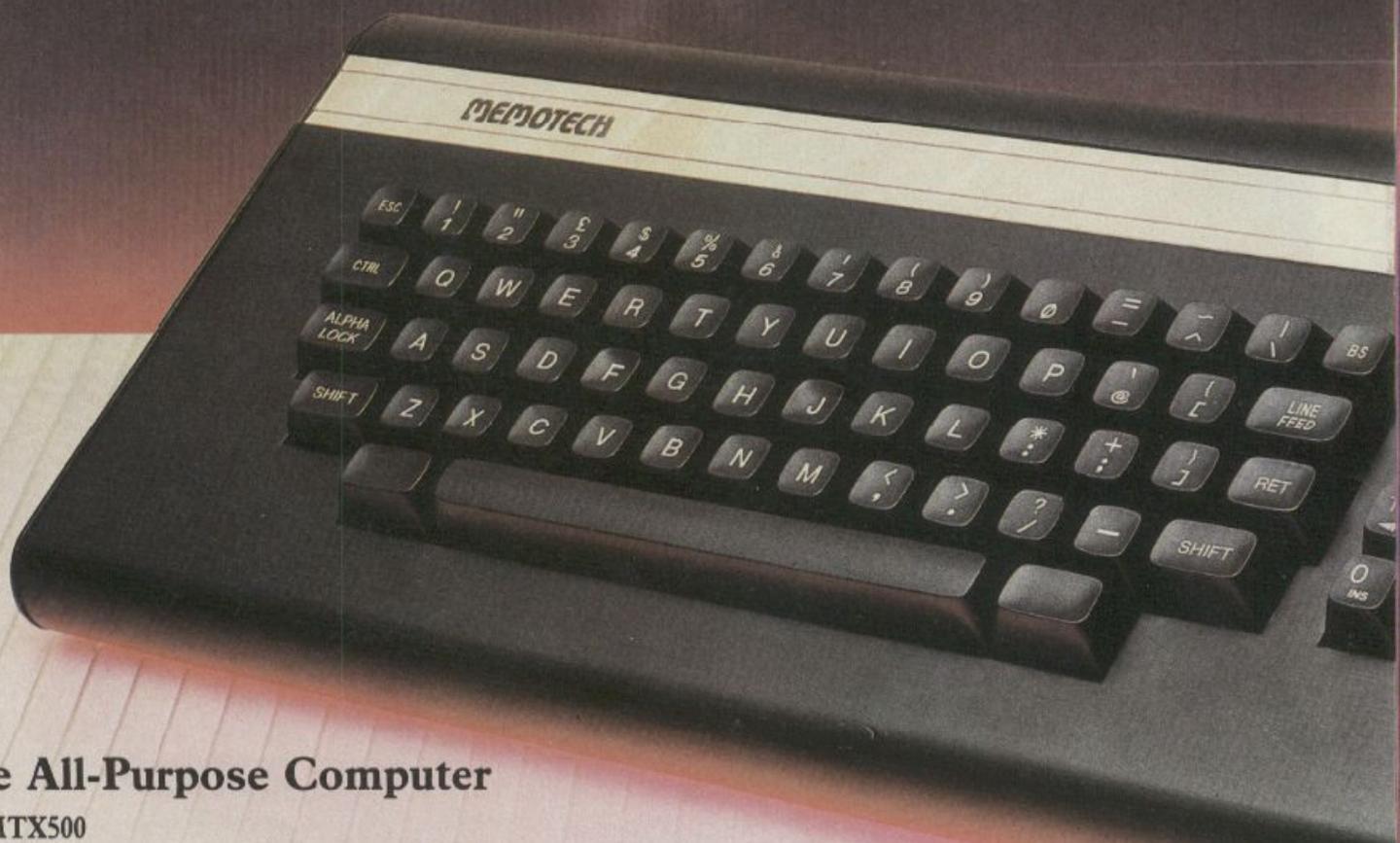
Embedded in the software is our unique score validator which enables us to introduce a new dimension to computer games. The top ten scorers in each calendar month from April through September will receive a "I'm a Black Hole addict" T-shirt and the chance to compete for prizes to the value of £500 in a championship to be held at the end of the year. We will then publish a list of the top 1000 scorers so you can find out just how good you are.

HOW GOOD ARE YOU? Take up the "BLACK HOLE" challenge NOW and find out. Send £5.50 to QUEST, 119 THE PROMENADE, CHELTENHAM, GLOS GL50 1NW to receive your copy of "BLACK HOLE" by return first class post together with a membership number entitling you to discount on our forthcoming blockbusting software.

**Trade enquiries welcome
excellent terms available**

**A NEW DIMENSION
IN SPECTRUM SOFTWARE**

Designed to



The All-Purpose Computer

The MTX500

The MTX500 is a new departure in micro-computer technology. Whether your needs as a user are for personal programming, games playing, scientific or process control, educational or business use the MTX500 is already capable or very easily adaptable to almost every application. Glance through the standard features below – you'll see what we mean.

Software

The MTX500's 16k ROM contains several languages and routines which enable the novice or the experienced programmer to make full use of the machine. Standard languages are MTX BASIC, LOGO and NODDY. ROM routines include an ASSEMBLER/DISASSEMBLER with screen display of the Z80 CPU registers, memory and program which can be manipulated from the keyboard. Machine code programs can be stepped through one instruction at a time, and easily called from within BASIC.

programs. A further feature is the Virtual Screen facility which enables the programmer to define sections of the screen to work independently whilst maintaining all full screen facilities. Pascal is available as an add-on ROM pack.

Hardware

As standard – 32k of user RAM expandable to 512k plus 16k of dedicated video RAM. Sixteen colours, 40 column text, 256 × 192 high resolution graphics with all sixteen colours available and easily moveable user defined graphics (Sprites) combine to make effective screen displays quick and simple to achieve. Standard outputs are centronics printer

Perform



port, two joystick ports, an uncommitted I/O port, 2400 Bauc Cassette port, separate TV and Video Monitor ports, 3 voice sound with hifi output plus a dedicated games cartridge port. Other standard features include the Z80A processor running at 4MHz, real time clock, full moving key keyboard with 79 keys including eight function keys and separate numeric pad. Optional expansions include 80 column colour

video board, twin RS232 interfaces, 5¼ and 8 inch floppy disc interfaces to run CP/M, Node interface to enable ring system, plus an A/D and D/A converters.

MEMOTECH
MTX500

For further information, please write to:
Sales Dept. Memotech Limited, Station Lane Industrial Estate,
Witney, Oxon. OX8 6BX. Telephone Witney (0993) 2977.

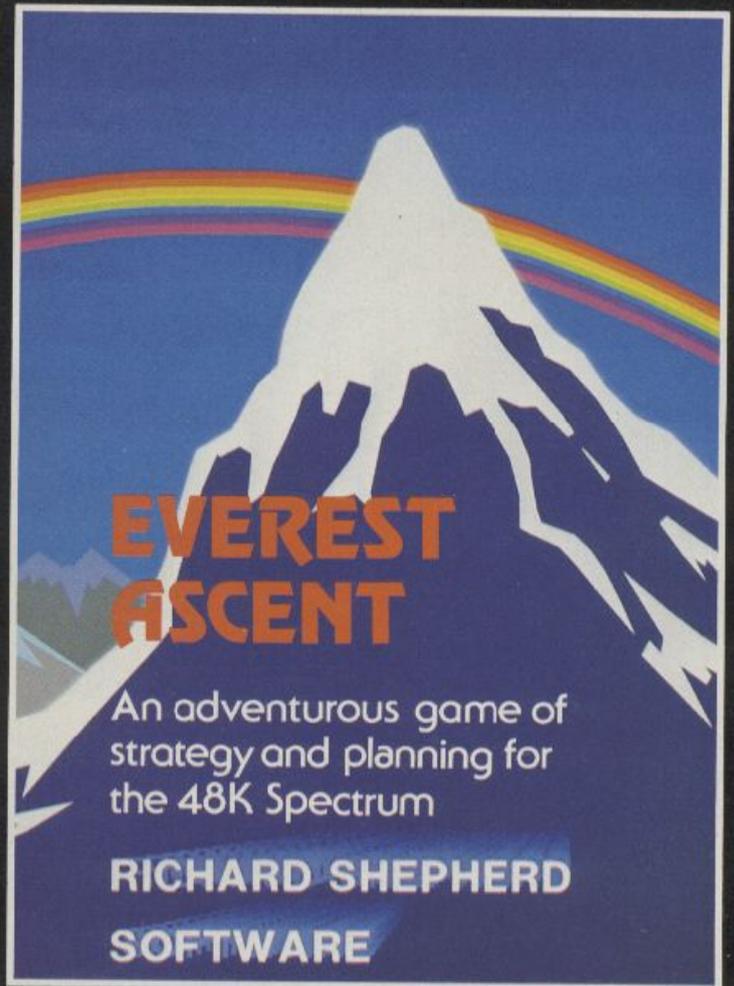
**NOW AVAILABLE FROM W. H. SMITH & SON,
JOHN MENZIES AND BOOTS**



**TRANSYLVANIAN
TOWER**

A spectacular 3-D maze
adventure for the
48K Spectrum

**RICHARD SHEPHERD
SOFTWARE**



**EVEREST
ASCENT**

An adventurous game of
strategy and planning for
the 48K Spectrum

**RICHARD SHEPHERD
SOFTWARE**

TRANSYLVANIAN TOWER

A spine chilling adventure ... enter via the dungeons ... navigate your way through 500 3-D rooms ... survive the swooping vampire bats ... reach the terrifying top ... and rid the world of the evil Count Kreepie!

Can you survive the top of The Tower?
Full save routine for use during the hours
of darkness!

48K Spectrum. **£6.50.**

Also available by mail order

SHIP OF THE LINE

Command a sailing ship ... juggle your supplies, crew and firepower ... fearlessly battle your way up the admiralty ladder, bribe Sea Lords as necessary ... until you make First Sea Lord! Full save routine. 48K Spectrum. **£6.50.**



EVEREST ASCENT

Conquer the world's highest peak in defiance of all the obstacles, men and nature can throw at you ... survive avalanches ... cross bottomless crevasses ... cope with wayward Sherpas — but don't run out of supplies!

Full save routine. 48K Spectrum. **£6.50.**

Also available by mail order

SUPER SPY

A global spy chase through complex puzzles, coded messages and 3-D mazes. Follow Dr. Death's trail ... locate his secret island ... discover the entrance to his lair ... but it doesn't end there! A different solution every game. Full save routine. 48K Spectrum. **£6.50.**

**RICHARD SHEPHERD
SOFTWARE**

Dealers: Generous discounts available

Credit Card Hotline 0628 21107

All programs are sold subject to the condition that they may not, by way of trade or otherwise, be lent, hired out, resold or otherwise circulated without the written permission of Richard Shepherd

DISCOUNT: BUY TWO GET £1 OFF
BUY THREE GET £2 OFF
BUY FOUR GET £3 OFF

ALL PRICES INCLUDE
VAT & FIRST CLASS UK POSTAGE
OVERSEAS ORDERS ADD £1.50 FOR AIR MAIL

48K EVEREST ASCENT	at £6.50	£
48K TRANSYLVANIAN TOWER	at £6.50	£
48K SUPER SPY	at £6.50	£
48K SHIP OF THE LINE	at £6.50	£
DEALER PACK	—	—
	DISCOUNT	—
	TOTAL	£

a) I enclose cash/cheque/P.O. payable to Richard Shepherd Software

b) Debit my ACCESS/VISA Card No.

with the sum of £..... Signature

NAME ADDRESS

SEND IMMEDIATELY TO: RICHARD SHEPHERD SOFTWARE
FREEPOST (no stamp needed), MAIDENHEAD, BERKS, SL6 5BY

SOFTWARE REVIEWS

Each month PCT will be presenting pages of reviews of the computer programs currently available. We have engaged a team of reviewers, each of whom is a seasoned user of his/her particular machine — and has the crazy streak that means they enjoy playing computer games!

All types of software will, however, be reviewed in these pages; but with around 85% of all home-computer software being of the playful variety, you will be seeing more games than anything else!

Our 'Ratings Table' headings are:

Program Quality

Here we're looking to see how well written the program is, and how well it exploits the computer's capabilities. Also, how logical is the structure of the program? Does it require the user to make guesses to use it?

Crashproofing

We all hit the wrong key sometimes,

do we not? Go on, admit it. If the program has been well written, all should not be lost. If, for example, the machine is asking you to enter "Yes" or "No", then any other key except Y or N should illicit no response whatsoever. In other words, how tolerant is the program of us humans?

Value For Money

Quite frankly, some software on sale today is vastly overpriced. With the low cost of cassette tapes, why *should* simple games cost up to £12 per tape? We judge this one on an overall basis — how much work have the suppliers put into the program and is the price reasonable?

Presentation On-screen

How good are the graphics used in the program? If the instructions are provided on screen, are they both readable and easy to understand? This section examines the

visual aspects of the package — vital for games!

Ease Of Use

If the program is for, say, an 'action' game, then the author's choice of keys is very important. Try playing "Invaders" with the movement keys reversed, and the "Fire" button right next to 'Reset'! There are many, many ways in which life can be made easy for the program user. We want to see them *all* used!

Supplied Instructions

Regardless of whether the instructions come on sheets of paper, or are presented as text on-screen, they should be as clear and as concise as possible.

Ratings are done on a "Five stars is excellent, one is hopeless" basis, with the reviewer then scoring the supplied package as a whole on a percentage scale.



Title: Jet Pac
Type: Tape
Supplier: Ultimate Play The Game
Machine: Spectrum 16K/48K
Price: £5.50

Jet Pac has you playing the part of a space suited adventurer who finds himself stranded on an alien

planet. To escape, you must first assemble your rocket from its component parts, then collect fuel to power it. All this has to be accomplished while fighting off the local aliens with your Quad Photon Laser Phaser (!) and collect the various 'goodies' (gems, gold etc) that are lying around.

The game gets its name from the jetpack you wear. This enables you to move round the screen area in all directions. Having refuelled your spaceship you then set off for another planet to collect more valuables and fuel, with yet another set of aliens to contend with.

After four planet-falls your spaceship wears out and you must build another one. In all there are 16 different waves of aliens to contend with and each react in a different manner.

The game can be played by either one or two players and control is by either Kempston joystick or the keyboard. The high scores are recorded, but unfortunately the player's name is

not.

The graphics are good, with many small touches that put the program well ahead of most others. Movement control is good and the game offers enough variations to make it a highly entertaining and addictive addition to any software library.

Ratings Table

Program Quality	* * * * *
Value for Money	* * * * *
Presentation On-screen	* * * * *
Ease of use	* * * * *
Crashproofing	* * * * *
Supplied Instructions	* * * * *
Overall	94%

Title: The Black Hole
Type: Tape
Supplier: Quest
Machine: Spectrum 16K/48K
Price: £5.50

I always worry when I see advertising packed full of

GAMES



superlatives. When I saw that the advertising for the Black Hole contained phrases such as: Simply the Best and A New Dimension, alarm bells started ringing. Needless to say my fears were realised.

The graphics were excellent, but after the original impact I found that they lacked variety. The game boasted "Incredible explosive and full sound effects". These were fair, but not particularly impressive. They could have probably reached more explosive proportions if the game was played in conjunction with one of the sound amplifiers which are available for the Spectrum.

The game is written entirely in machine code and therefore is fast. The arrangement of the control keys is slightly odd. They are all on the bottom row of the keyboard. Once you have got used to this arrangement, operation of the game becomes quite fast.

The Black Hole of the game's title flashes away at the centre of the screen. From it emanate alien spacecraft, which exit in any one of three directions. Your spaceship is confined to the left half of the screen and is armed with three weapons. The first is the Neutron Blaster which has a straight beam. Your other two weapons are a positive and negative ion gun. These fire with beams that bend either upwards or downwards, according to their charge.

The game is difficult and takes quite a lot of practice to obtain proficiency. To this end, Quest have included a practice mode which allows you the chance to brush up on your technique.

Every month they are giving away ten T-shirts as prizes to the people with the highest score. You might even get a chance to compete in a championship at the end of the year with prizes worth

up to £500.

In conclusion, the game is good and fun to play, but I wouldn't class it as a classic.

Ratings Table

Program Quality	* * * *
Value for Money	* * * *
Presentation On-screen	* * * *
Ease of use	* * *
Crashproofing	* * * *
Supplied Instructions	* * * *
Overall	75%

Title:	Transylvanian Tower
Type:	Tape
Supplier:	Richard Shepard Software
Machine:	48K Spectrum
Price:	£6.50

Good idea this. Battle your way through the Vampires Lair and stake out Dracula himself! Nice graphics too — corridors in perspective, doors, windows and the inevitable bats swooping about.

All good stuff — but all brought to nought by a lousy game system that makes for excruciatingly boring play action. It takes AGES to draw you a floor map of where you are — I'd lost interest by the time it finished — and even longer to move from one floor to the next. (Some minutes in fact).

The tape is billed as a mixture of action and adventure in as much as that you have to shoot down 20 bats to advance to the next level AND find your way through a maze, picking up artifacts as you go. Count Dracula is only to be found higher up the Tower. Trouble is I found it very difficult to get there. Not because the game is so difficult that you die a lot whilst learning, but because I found it totally uninteresting after a very short time indeed.

A game of any sort should be playable immediately and thereafter offer a return directly related to the effort expended. In Transylvanian Tower you can stagger around for half-an-hour trying to figure out what a nice person like you is *doing* in a place like this, only to step out onto Floor 2 and get treated as a Wimpy by a Vampire Bat that no-one has told you how to kill! Infuriating to the point of tape crunching.

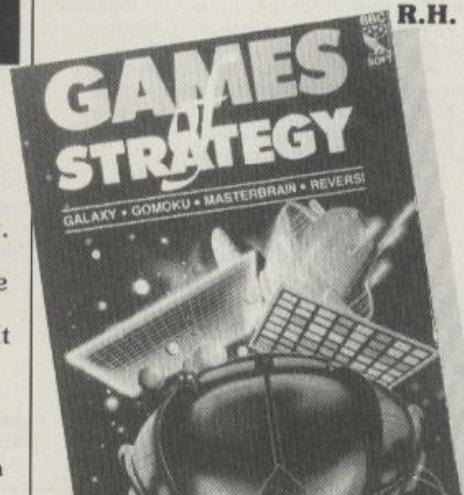
This is basically a good product, but someone needs to go

over it from the point of view of GAME design as opposed to PROGRAM design AND do something about the instructions. They are neither informative or concise.

As a demonstration of Spectrum graphics — excellent. As a thrilling and absorbing adventure ... Shame.

Ratings Table

Program Quality	* * *
Value for Money	* * *
Presentation On-Screen	* * * *
Ease of use	*
Crashproofing	* * * *
Supplied Instructions	* *
Overall	49%



Title:	Games of Strategy
Type:	Tape
Supplier:	BBC Publications
Machine:	BBC A or B
Price:	£10.00

This pack contains 4 popular strategy games: Galaxy, Gomoku, Masterbrain and Reversi.

Galaxy is a fairly standard version of the popular computer game 'Star Trek'. As captain of the starship 'Endeavour', the player's mission is to rid the galaxy of the evil Kryons before a certain stardate. To replenish the Endeavour's energy supply you must dock at one of the starbases you find scattered throughout the galaxy.

The difficulty level (1-3) influences the time in which the mission is to be accomplished. The number of Kryons and the number of starbases. The enemy can be destroyed using phasors or photon torpedoes. 64 sectors comprise the galaxy and each of these is in turn divided into 64 sub-areas. It is

through these that you steer your craft and battle towards your destiny.

Gomoku is similar to the game 'Connect 4', except that the object is to get five not four pieces in a row. The board is a 19 by 19 grid and the object is to beat the computer into getting a row of five pieces either horizontally, vertically or diagonally. The pieces are positioned on the board by directing a cursor to the required cell.

Masterbrain is yet another version of the popular board game Mastermind. The object of the game being to guess a colour code chosen by your opponent. In this version you have to guess a four-digit number which the computer chooses, in as few goes as possible. After each guess the computer marks your attempt and tells you how many digits you have guessed correctly. You can reverse the game play and have the computer guess a code which you decide.

The final game on the tape is another old favourite, Reversi. This is the computer version of Othello. In it you have to capture enemy pieces by blocking them either end with counters of your own colour. When captured, the enemy pieces change to your colour and your opponent the winner of the game is simply the player who has most pieces of his own colour on the board when it becomes full.

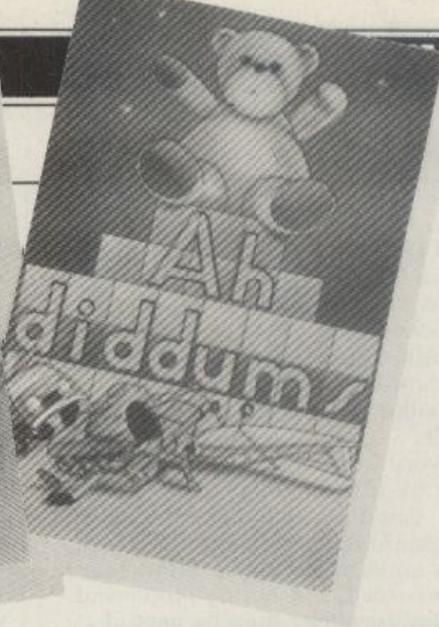
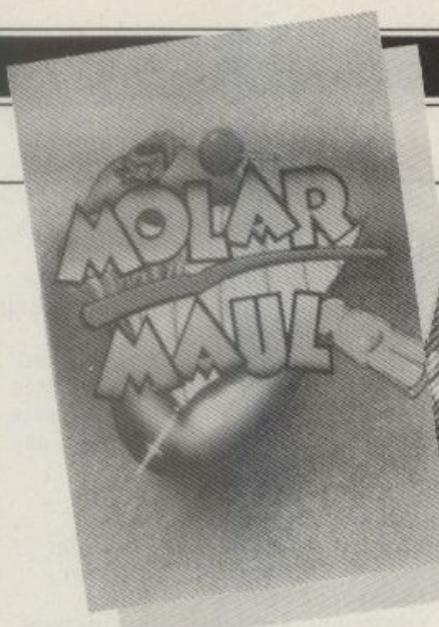
None of the programs are particularly stunning display-wise having been written in Mode 2 to ensure their working in the Model A. Despite these limitations they are quite enjoyable. The two board games, Gomoku and Reversi play to a reasonable standard. Although none of these programs are brilliant, they offer good value for money.

Ratings Table

Program Quality	* * *
Value for Money	* * *
Presentation On-Screen	* * *
Ease of use	* * * *
Crashproofing	* * * *
Supplied Instructions	* * *
Overall	60%

Title: Mdar Maul
Type: Tape
Supplier: Imagine
Machine: Spectrum 16K/48K
Price: £5.50

Here you are faced with the care of a mouthful of virgin-white teeth.



You are supplied with three toothbrushes and a never ending supply of IMAGICO toothpaste. First you must position your toothbrush next to the tube of toothpaste to load your brush with paste. Once you have prepared your brush you must rush round the mouth, scrubbing teeth as you go, hopefully preventing decay. Meanwhile the nasty little bacteria are happily floating around attaching themselves to your teeth and causing them to decay. Should you let four teeth become permanently damaged then you lose one of your toothbrushes. If your use up a whole tube of toothpaste then the bacteria level increases and you must work harder to keep your teeth intact.

Various sweets appear and when the bacteria eat them they become more powerful. The graphics are bold and colourful but not very exciting. Although the game requires you to keep up a high level of concentration and dexterity there is not enough variation in what happens to make this a game that is going to become particularly addictive. Certainly good fun and appeals to the kids. . . trouble is they end up playing it when they should be cleaning their own teeth.

The high score is shown as the highest bacteria level reached. Although the high scores are retained they do not include the players name, Joysticks can be used but I found keyboard operation acceptable.

Ratings Table

Program Quality	* * * *
Value for Money	* * *
Presentation On-screen	* * *
Ease of use	* * * *
Crashproofing	* * * * *
Supplied Instructions	* * * *
Overall	77%

Title: Ah Diddums
Type: Tape
Supplier: Imagine
Machine: Spectrum 16K/48K
Price: £5.50

Baby is crying so the light has been left on in the nursery and when the light is on the toys are happy because they can play all night. But Teddy loves baby and wants to comfort her. . . if he stops her crying the light will be turned out and the toys will have to go to sleep. Such is the scenario for Ah Diddums, you are Teddy trying to get out of your toybox and the other toys are dead set on trying to stop you reaching baby. Sadly you are in a nested set of 99 (yes 99!!) toyboxes and you must pick up all the play bricks in each box to build a staircase out of each one!

Meanwhile the toys are trying to stop you and the nearer you get to baby the nastier the toys get and more of them join in stop you. Teddy has some help along the way: he may pick up some things and throw them at the toys, he can also use a peashooter to some advantage. He also has a friend in the 'Jack in the Box' who will stop the toys moving for a while. . . when he is awake!

The graphics are colourful and attractive, particularly Teddy as he clammers around his box. I would like to meet baby, in fact I would like to meet anyone who has met baby because having only got to box 10 and been beset by flying airplanes, golliwogs, spinning tops and toy trains. I really believe it must be well nigh impossible, but then I'm sure someone will prove me wrong!

A thoroughly enjoyable game with the slight reservation that I would have liked to believe that one day I might win through! The review tape seemed to have a bug in that if I held the peashooter too

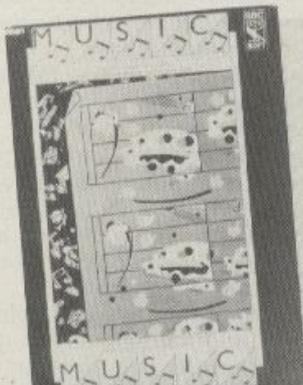
GAMES

close to the unstoppable plasticene then the peashooter disappeared and I was unable to pick up any more bricks. The only solution here was to get my stuffing knocked out by one of the nasties. Imagine believe we may have had a preproduction tape so it is possible yours will not have this fault...but be warned, this could be very frustrating if you were in box 98 with one life left!

Good fun, good graphics...an original idea which should keep you amused for hours. High score is recorded, but not by name and Fuller Joysticks may be used if desired. Keyboard operation is quite easy and effective.

Ratings Table

Program Quality	* * * * *
Value for Money	* * * * *
Presentation On-screen	* * * * *
Ease of use	* * * * *
Crashproofing	* * *
Supplied Instructions	* * * *
Overall	83%



Title: Music
Type: Tape
Supplier: BBC Publications
Machine: BBC A or B
Price: £10.00

This package allows the creation of tunes in up to three parts. These tunes can then be edited, speeded up, slowed down and SAVED to tape. The package also offers a choice of four different instrument voicings.

On running the program three staves are printed on the screen and the computer waits for your first command. Your tune is played into the computers memory by using two rows of keys on the keyboard (a diagram showing the corresponding notes is supplied). Wrong notes can be erased using the DELETE key. A horizontal bar representing a note is displayed on the corresponding line of the staff; the longer the bar, the longer the

note.

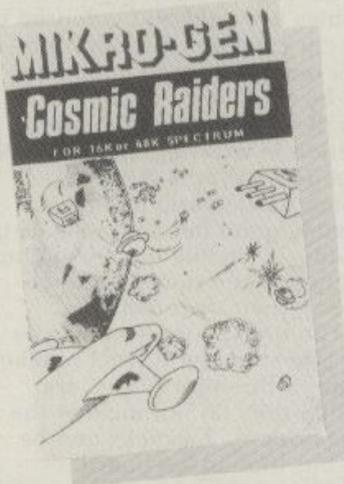
The four instruments voicings supplied are: organ, harpsicord, violin and piano. However, these do not really sound much like their instrument counterparts. The tempo of the piece can be altered between 0 (slow) and 9 (fast). It is possible to play back the contents of the three staves separately, as well as in unison.

Although the package is capable of producing quite impressive results it does suffer from quite a serious fault. For instance if you play in tune containing a mixture of crotchets (single beats) and quavers (half beats), on playback all the notes will be the same length. The greatly restricts the degree of complication of rhythm that can be used. The program doesn't exactly stretch the limit of the BBC Micro.

For this price I would expect a program designed specifically for the Model B, incorporating high-resolution graphics to display staves and notes, a wider choice of instruments and the ability to define your own sound.

Ratings Table

Program Quality	* * *
Value for Money	* *
Presentation On-screen	* *
Ease of use	* * *
Crashproofing	* * * *
Supplied Instructions	* * *
Overall	55%



Title: Cosmic Raiders
Type: Tape
Supplier: Mikro Gen
Machine: ZX Spectrum 16K
Price: £5.95

Before we go any further "BUY THIS GAME" you will not be dissappointed, that I can guarantee. This version of "Defender" is one of

the very few times I have seen an implementation of an arcade game where the original has actually been improved upon.

The objective is much clearer than Defender in as much as you are launched from a city complex on an alien planet. There are humanoids in this city area who jump up and down in excitement when you fly over them or when they are being dropped to their painful and untimely death by the naughty green grabber. To stop millions of grabbers, defenders, interceptors and escorts appearing on screen you must race to the other side of the planet to destroy the master ships in their lair. If there is just one master ship left intact it can procreate new baddies at a tremendous rate.

While you are going for the mastership, the grabbers with the protection of the escorts are having a fun time abducting the poor humanoids. This is where the hard earned talents you mastered at Defender come into play. The safest way to deal with this problem is to use one of the three smart bombs you are given to knock out all the badies on the screen then catch the humanoids as they fall. If you miss one there is a sickening splat as the humanoid hits the deck.

The carnage levels are precisely worked out to give the novice a chance to last more than ten seconds and the dead eye dick to sweat at the high levels. At the top of the screen is a plot of the whole planet surface showing the position of your ship in relation to the baddies so you can plan the attack just like the real thing.

There is no provision for joystick control in this game but this suprisingly was not a drawback because the keyboard positions used are the best/fastest I've come across. With a good range of nasties and clear sound this is a very good game for the 48K Spectrum and an absolute must for 16K.

Ratings Table

Program Quality	* * * * *
Value for Money	* * * * *
Presentation On-screen	* * * * *
Ease of use	* * * * *
Crashproofing	* * * * *
Supplied Instructions	* * * * *
Overall	83%

P.G.



DRAGON 32 OWNERS
 Shoot your mouth off
 in...

Talking Android Attack

Another great game from Microdeal the first of a new generation of fast action, talking arcade games. At the start of each frame the computer warns the androids of an intruder "Intruder Alert"!! Now you can either run for the nearest doorway, escape and be called a "Coward", or chase, shoot and try to wipe out the androids, however, if you hit one it will turn into a GHOST ANDROID, capable of wandering thru walls — which of course are electrified with a fatal effect on you when touched!! Should you clear the screen the computer sneers "I'll get you next time". Will it?



All Cassettes £8 each (including VAT & Postage)
 AVAILABLE FROM DRAGON 32 DEALERS NATIONWIDE OR ORDER DIRECT
 SEND 1st CLASS STAMP FOR OUR FREE SOFTWARE LISTS
 FOR DRAGON 32 & TANDY RANGE OF COMPUTERS.

MICRODEAL
 14 TRURO ROAD, ST. AUSTELL,
 CORNWALL, PL25 5JE. TEL: 0726-67676.

AVAILABLE FROM SELECTED
 and **Boots**
John Menzies





TRY FIGHTING THESE WITH YO



UR BARE HANDS.

Slot "Mutant Herd" into your VIC 20 computer and all of a sudden plutonium-crazed mutants will try to eat you alive.

Keep a look-out for falling boulders. They'll crush you to death at any second.

Avoid these successfully and all you have to do is save the world by destroying the heavily guarded Mutants eggs.

"Orc Attack" (on ATARI 400/800/1200) isn't exactly child'splay either.

Imagine yourself standing on the battlements of a castle, defending your Kingdom against an army of ferocious Orcs.

Watch out for the hail of deadly crossbow bolts. You've only got two lives to lose.

And you've only got a few rocks, a sword and boiling oil to defend yourself.

Lose your head and you'll be decapitated.

If your hands aren't sweating after that try our other action packed titles.

There's "Fourth Encounter" (on VIC 20), an exciting new game with 3 skill levels.

The challenging "River Rescue" and "Music Composer" are also on VIC 20.

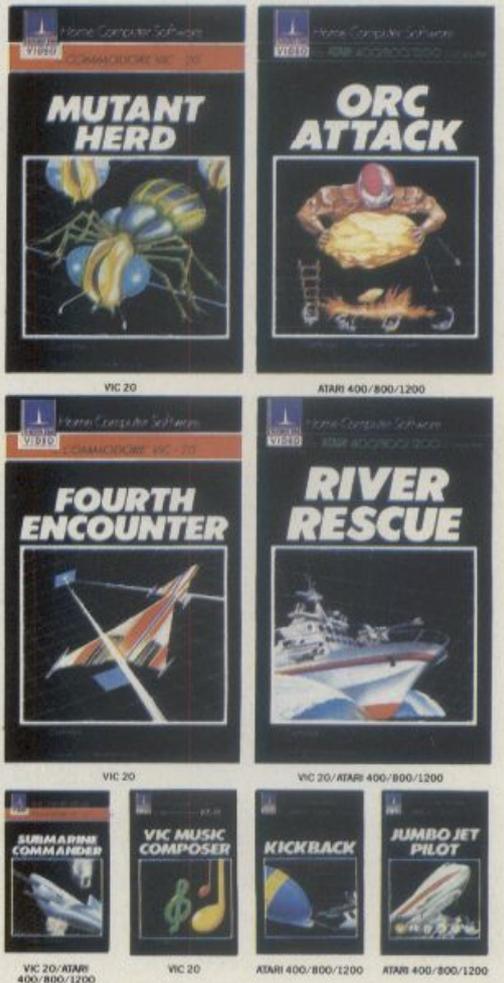
And to make the blood rush to your head the successful "Submarine Commander" is now available on VIC 20.

Or, if you've got ATARI 400/800/1200, there's the anxiety provoking "Jumbo Jet Pilot," as well as the best selling "Submarine Commander," "River Rescue" and "Kickback," all in the shops now.

Buy any one of THORN EMI Computer games and you'll have to fight off all your friends to use it.



The world's greatest computer games.



VIC 20/ATARI 400/800/1200 VIC 20 ATARI 400/800/1200 ATARI 400/800/1200
 PROGRAMS FOR ATARI 400/800/1200 [Trademark of Atari Inc. except where indicated].
 - PROGRAMS FOR COMMODORE VIC 20 [Trademark of Commodore Electronics Ltd.].

Announcing more exciting programs for the BBC.

Acornsoft is the software division of Acorn Computers, the company that designed and built the BBC Microcomputer. Here are four more exciting programs, all designed to get the most from your BBC Micro.

Starship Command (£9.95) is a demanding high-resolution graphics game in which you command a starship against attacking alien ships. You control the forward drive and rotational thrust of your ship, which is equipped with shields, long and short-range scanners and a sector display of the stars and alien ships.

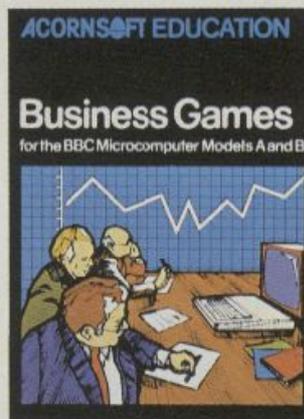
Countdown to Doom (£9.95) is a race against time as you strive to repair your damaged space ship in the corrosive atmosphere on the planet Doomawangara (Doom). Beat the clock or resign yourself to a life in the wilderness of Doom.

Business Games (£9.95) is a cassette containing two games designed for economics, business or general studies teaching.

In **Stokmark**, up to eight players compete in buying and selling shares aided by a screen display of relevant market information.

In **Telemark**, players compete to dominate in the manufacture and sale of televisions. The winner is the one who makes the largest profit or controls over half the total market.

Jars (£11.90) is an educational cassette suitable for 7-13 year olds. The objective of the program is to present, what are usually thought of as purely numerical problems, in a visual way. Jars of liquid are used to visualise volume estimation and fraction problems. Success, partial success or failure is noted by a scoring system and suitable comments.



How to get Acornsoft programs.

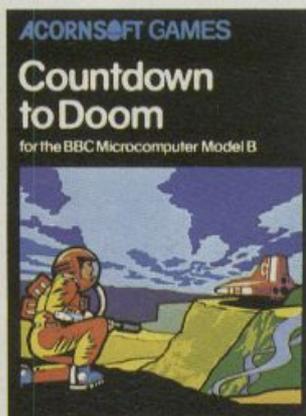
If you're a credit card holder and would like to buy cassettes of the programs shown in this advertisement, or if you would like to know the address of your nearest stockist, just phone 01-200 0200.

Alternatively, you can buy the cassettes directly by sending off the order form below to: Acornsoft, c/o Vector Marketing, Denington Estate, Wellingborough, Northants NN8 2RL.

Also use this form if you would like to receive the current free Acornsoft catalogue.

Please allow 28 days for delivery.

☎ Credit Card Holders. Telephone 01-200 0200.



To: Acornsoft, c/o Vector Marketing, Denington Estate, Wellingborough, Northants NN8 2RL.

Please send me the following:-

PROGRAM	PRICE	QUANTITY	TOTAL	(Code Acornsoft use only)
Starship Command	£9.95			SBG22
Countdown to Doom	£9.95			SBG19
Business Games	£9.95			SBE03
Jars	£11.90			SBE15

TOTAL

I enclose PO/cheque payable to Acornsoft Ltd.

Or charge my credit card.

Card Number _____

(Amex/Diners/Visa/Access (Delete))

Please send me the Acornsoft brochure PCT6

Name _____

Address _____

Postcode _____

Signature _____

Registered No. 1524765. VAT No. 215 8123 85

ACORNSOFT

GAMESBOARD

GORILLASSI

Capture enemy gorillas in this game of strategy for the Texas TI99/4A

This game is played exactly like Othello. It is a board game for two players, played on a conventional chess board with eight by eight squares. The pieces are double sided, coloured black on one side and white on the other. Any of the opponents pieces in a straight line between the last piece played and another of the player's pieces is captured, that is to say turned over, to convert it to that player's colour. The game finishes when the board is covered with pieces or when neither player can move, and the winner is the player with the most pieces at that stage.

To make the game more interesting, instead of black and white counters there are black and white gorillas, as the name suggests.

Running The Program

When the program is run it asks for your name, it can then refer to you personally as the game goes on. It then plays a rendition of Sweet and Low before printing out the playing board. This consists of dark green and red squares numbered 1 to 8 down the side and 2 to 9 across the top. The computer then asks you if you want to go first, to this you

must either type a "Y" or an "N". If you typed a "Y" then it will ask you for a row number, once that is pressed the computer proceeds to put your gorilla onto the board. If a counter is already there, it calls you a cheat and proceeds to have its move. If you cannot capture any gorillas at that square then the computer ignores your move.

To find out the score, just type 00 instead of the row and column. In the interests of speed the computer does not work out the score after each move, thus at the end of the game 00 has to be entered before your win, lose, draw is confirmed.

HOW IT RUNS

10-30	Clears the screen and inputs your name.		
40-50	This plays the tune, ie. goes to the subroutine at line 2550.	1140-1150	The K loop is only of concern when it is the computer's go, this tests to see whose go it is.
60-70	Goes to the subroutine which defines the characters and their colours.	1160-1170	Checks to see if the last go was the human's go.
80-110	Initialises the arrays and the two strings X\$ and Y\$.	1180-1260	Puts the computer's counter into the array B\$ and your counter into the array C\$.
120-150	Prints "ME" and "YOU" on the left and right of where the playing board will be.	1270-1300	Prints out the message for you to input the line and column number.
160-210	These are the main parts of the playing board, ie. the chequered pattern.	1310	Jump to the routine which inputs your move.
220-230	These lines piece together the parts of the board into two strings.	1320	If you input 00 then this jumps to the routine for working out the scores.
240-270	Puts the above strings into the array A\$.	1330-1350	This makes sure that you have not put your counter on top of another, it calls you a cheat if you have.
280	Restores the data in line 290 in case of another game.	1360-1440	Checks each square on the board to count the number of your pieces and the number of the computer's pieces.
290-450	Puts each counter into its respective position for the start of the game.	1450-1480	Prints the computer's score onto the screen.
460	The computers	1490-1520	Prints your score onto the screen.
480-620	This routine prints the board onto the screen directly from the array A\$.	1530-1620	These are the conditions for a win, lose or draw.
630-640	Places two small arrows at the top left hand corner of the screen.	1630-1680	Tells you that you are a cheat if you try to put your counter onto another counter.
650-720	This asks you if you want to go first, then jumps to the appropriate routine.	1690-1700	Sets move to 0 and goes to the computer's move.
730-810	Puts your counter into the array B\$ and the computer's counter into the array C\$.	1720-1780	This records your row number and puts it into Q5.
820-870	Sound effects before the computer takes its go.	1790-1880	This records your column number and adds it to Q4.
890	Loop which counts 1 to 60 as the computer looks at each of the possible 60 places to go.	1890-1910	This puts the value of your move into B and returns to the main program.
900	More sound effects.	1920-1930	Tests for the colour of the background and if it is dark green then jump to line 2080.
910	This takes information from the computer's strategy with the aid of the loop K.	1950	If there is a white gorilla needed then goto line 2020.
920	Tests to see if there is anything already on that square.	1960-2010	Print a black gorilla with a red background.
930-1130	Tests to see if there are any counters which can be captured and if so then that is where the computer	2020-2070	Print a white gorilla with a red background.
		2090	If there is a white gorilla needed then goto line 2160.


```

1050 A$(1,A)=C$(2,2)
1060 LINE#1+2:INT((A-1)/20)
1070 COL=4+A-20:INT((A-1)/20)
1080 GOSUB 1920
1090 A$(2,A-1)=C$(2,1)
1100 A$(2,A)=C$(2,2)
1110 H=1
1120 NEXT A
1130 NEXT X
1140 IF (B$(1,1)="h")+ (H=1) THEN 1160
1150 NEXT K
1160 IF B$(1,1)="h" THEN 740
1170 IF H=0 THEN 1370
1180 REM HUMANS MOVE
1190 B$(1,1)="h"
1200 B$(1,2)="i"
1210 B$(2,1)="j"
1220 B$(2,2)="k"
1230 C$(1,1)="a"
1240 C$(1,2)="b"
1250 C$(2,1)="c"
1260 C$(2,2)="d"
1270 MSG#="@WHERE TOB*IN#*00 FOR SCORE"
1280 FOR I=1 TO LEN(MSG#)
1290 CALL HCHAR(21,I,ASC(SEG$(MSG#,I,1)))
1300 NEXT I
1310 GOSUB 1710
1320 IF B=0 THEN 1370
1330 IF (A$(1,B#2)="" >*(A$(1,B#2)="" >*) THEN 1340 ELSE 1350
1340 GOTO 1630
1350 GOTO 930
1360 REM CALCULATE SCORE
1370 CP=0
1380 HP=0
1390 FOR A=23 TO 177 STEP 2
1400 IF A$(1,A)="h" THEN 1410 ELSE 1420
1410 CP=CP+1
1420 IF A$(1,A)="a" THEN 1430 ELSE 1440
1430 HP=HP+1
1440 NEXT A
1450 MSG#="STR$(CP)&"@
1460 FOR I=1 TO LEN(MSG#)
1470 CALL HCHAR(10,I+2,ASC(SEG$(MSG#,I,1)))
1480 NEXT I
1490 MSG#="STR$(HP)&"@
1500 FOR I=1 TO LEN(MSG#)
1510 CALL HCHAR(10,I+27,ASC(SEG$(MSG#,I,1)))
1520 NEXT I
1530 IF HP=0 THEN 2020
1540 IF CP=0 THEN 2040
1550 IF CP+HP<64 THEN 1180
1560 IF CP>HP THEN 1570 ELSE 1580
1570 GOTO 2020
1580 IF CP<HP THEN 1590 ELSE 1600
1590 GOTO 2040
1600 IF CP=HP THEN 1610 ELSE 1620
1610 GOTO 3060
1620 END
1630 REM INVALID MOVE
1640 CALL SOUND(-4000,-1,0)
1650 MSG#="CHEAT—I WONT PLAY NEXT TIME ???"
1660 FOR I=1 TO LEN(MSG#)
1670 CALL HCHAR(21,I+1,ASC(SEG$(MSG#,I,1)))
1680 NEXT I
1690 B=0
1700 GOTO 730
1710 M=5
1720 Q$=""
1730 CALL HCHAR(24,M,33)
1740 CALL SOUND(-100,500,0)
1750 CALL KEY(0,K,S)
1760 IF S=1 THEN 1700
1770 IF (K(49)+(K(56) THEN 1710
1780 CALL HCHAR(24,M,K)
1790 M=M+2
1800 Q$=Q$&STR$(K-48)
1810 CALL HCHAR(24,M,34)
1820 CALL SOUND(-100,500,0)
1830 CALL KEY(0,K,S)
1840 IF S=0 THEN 1830
1850 IF K=ASC("C") THEN 1710
1860 IF (K(49)+(K(57) THEN 1810
1870 CALL HCHAR(24,M,K)
1880 Q$=Q$&STR$(K-48)
1890 B=VAL(Q$)
1900 Q$=""
1910 RETURN
1920 CALL HCHAR(LINE,COL,CHR)
1930 IF (CHR=44)+(CHR=104)+(CHR=120) THEN 2000
1940 REM SQUARE IS REI
1950 IF C$(1,1)="h" THEN 2020
1960 CALL HCHAR(LINE,COL,97)
1970 CALL HCHAR(LINE,COL+1,98)
1980 CALL HCHAR(LINE+1,COL,99)
1990 CALL HCHAR(LINE+1,COL+1,100)
2000 CALL SOUND(-100,110,30,110,30,550,30,-4,0)
2010 RETURN
2020 CALL HCHAR(LINE,COL,112)
2030 CALL HCHAR(LINE,COL+1,113)
2040 CALL HCHAR(LINE+1,COL,114)
2050 CALL HCHAR(LINE+1,COL+1,115)
2060 CALL SOUND(-100,110,30,110,30,660,30,-4,0)
2070 RETURN
2080 REM SQUARE IS D.GREEN
2090 IF C$(1,1)="h" THEN 2160
2100 CALL HCHAR(LINE,COL,120)
2110 CALL HCHAR(LINE,COL+1,121)
2120 CALL HCHAR(LINE+1,COL,122)
2130 CALL HCHAR(LINE+1,COL+1,123)
2140 CALL SOUND(-100,110,30,110,30,770,30,-4,0)
2150 RETURN
2160 CALL HCHAR(LINE,COL,104)
2170 CALL HCHAR(LINE,COL+1,105)
2180 CALL HCHAR(LINE+1,COL,106)
2190 CALL HCHAR(LINE+1,COL+1,107)
2200 CALL SOUND(-100,110,30,110,30,880,30,-4,0)
2210 RETURN
2220 CALL CLERR
2230 CALL CHAR(33,"00010007F3E100")
2240 CALL CHAR(34,"0000022E3F2E0000")
2250 CALL CHAR(40,"FF00000000000000")
2260 CALL CHAR(41,"00000000000000FF")
2270 CALL CHAR(42,"8080808080808080")
2280 CALL CHAR(43,"0101010101010101")
2290 CALL CHAR(44,"FFFFFFF000000000")
2300 CALL CHAR(56,"0000000000000000")
2310 CALL CHAR(104,"0000000030040000")
2320 CALL CHAR(105,"0020501000021229")
2330 CALL CHAR(106,"A8A4A4947509327C")
2340 CALL CHAR(107,"252525259E904C3E")
2350 CALL CHAR(112,"0304000030404000")
2360 CALL CHAR(113,"0020501000021229")
2370 CALL CHAR(114,"A8A4A4947509327C")
2380 CALL CHAR(115,"252525259E904C3E")
2390 CALL CHAR(120,"0304000030404000")
2400 CALL CHAR(121,"0020501000021229")
2410 CALL CHAR(122,"A8A4A4947509327C")
2420 CALL CHAR(123,"252525259E904C3E")
2430 CALL CHAR(97,"0304000030404000")
2440 CALL CHAR(98,"0020501000021229")
2450 CALL CHAR(99,"A8A4A4947509327C")
2460 CALL CHAR(100,"252525259E904C3E")
2470 CALL SCREEH(8)
2480 CALL COLOR(1,9,1)
2490 CALL COLOR(2,13,1)
2500 CALL COLOR(3,2,9)
2510 CALL COLOR(10,16,13)
2520 CALL COLOR(11,16,9)
2530 CALL COLOR(12,2,13)
2540 RETURN
2550 FOR I=1 TO T
2560 RESTORE 2630
2570 READ H1,H2,H3
2580 IF H1=0 THEN 2610
2590 CALL SOUND(-4000,H1,0,H2,0,H3,0)
2600 GOTO 2570
2610 NEXT I
2620 RETURN
2630 DATA 392,311,233,392,311,233,392,311,233,523,370,220,523,370,220,523,
370,220
2640 DATA 466,392,233,466,392,311,466,392,294,622,415,262,622,415,262,622,
415,252
2650 DATA 622,392,233,587,349,233,523,311,233,466,294,175,466,294,175,440,
294,233
2660 DATA 523,311,175,523,311,175,523,311,175,466,294,233,466,294,233,466,
294,233
2670 DATA 392,311,233,392,311,233,392,311,233,523,370,220,523,370,220,523,
349,220
2680 DATA 466,392,233,466,392,233,392,311,233,253,349,220,523,349,220,523,
349,220
2690 DATA 698,456,294,587,349,233,622,392,233,523,311,233,523,311,220,587,
311,196
2700 DATA 523,311,175,523,311,196,523,311,220,466,294,233,466,294,233,466,
294,233
2710 DATA 466,415,294,587,415,233,523,415,262,466,415,294,523,311,415,466,
415,234
2720 DATA 466,392,311,622,392,311,523,370,311,466,392,311,466,392,311,466,
392,311
2730 DATA 466,415,294,587,415,233,523,415,262,466,415,294,523,415,311,466,
415,294
2740 DATA 466,392,311,622,392,311,440,370,311,466,392,311,466,392,311,466,
392,311
2750 DATA 622,392,262,622,392,262,622,392,262,349,196,622,349,220,587,
349,247
2760 DATA 523,311,208,523,311,208,253,311,208,494,311,208,494,311,208,494,
311,208
2770 DATA 466,392,233,466,392,233,466,392,311,466,415,294,523,415,294,466,
415,294
2780 DATA 466,392,311,466,392,311,466,370,311,466,415,294,253,415,294,466,
415,294
2790 DATA 622,392,277,622,392,277,622,392,277,622,415,262,622,415,262,622,
415,247
2800 DATA 622,392,233,622,392,233,622,392,233,622,392,233,622,392,233,622,
392,233
2810 DATA 0,0,0
2820 CALL HCHAR(21,1,32,120)
2830 M$="*****@BAD LUCK#@#H"
2840 M2#="@BUT I BEAT YOU#@STR$(CP)&"@T00"@STR$(HP)
2850 FOR I=1 TO LEN(M$)
2860 CALL HCHAR(21,I,ASC(SEG$(M$,I,1)))
2870 NEXT I
2880 FOR I=1 TO LEN(M2#)
2890 CALL HCHAR(23,I,ASC(SEG$(M2#,I,1)))
2900 NEXT I
2910 T=1
2920 GOSUB 2550
2930 GOTO 3180
2940 CALL HCHAR(21,1,32,120)
2950 M$="!!!!!!HELL DONE!!!!!!!"
2960 M2#="@YOU BEAT ME#@#H"@STR$(HP)&"@T00"@STR$(CP)
2970 FOR I=1 TO LEN(M$)
2980 CALL HCHAR(23,I,ASC(SEG$(M$,I,1)))
2990 NEXT I
3000 FOR I=1 TO LEN(M2#)
3010 CALL HCHAR(23,I,ASC(SEG$(M2#,I,1)))
3020 NEXT I
3030 T=1
3040 GOSUB 2550
3050 GOTO 3180
3060 CALL HCHAR(21,1,32,120)
3070 M$="!!! THAT WAS CLOSC!!!!"
3080 M2#="@A GOOD GAME#@#H"
3090 FOR I=1 TO LEN(M$)
3100 CALL HCHAR(21,I,ASC(SEG$(M$,I,1)))
3110 NEXT I
3120 FOR I=1 TO LEN(M2#)
3130 CALL HCHAR(23,I,ASC(SEG$(M2#,I,1)))
3140 NEXT I
3150 T=1
3160 GOSUB 2550
3170 GOTO 3180
3180 CALL HCHAR(21,1,32,120)
3190 M$="@ANOTHER GAME#@#H"@!!!!!!!"
3200 FOR I=1 TO LEN(M$)
3210 CALL HCHAR(21,I,ASC(SEG$(M$,I,1)))
3220 NEXT I
3230 CALL KEY(0,K,S)
3240 CALL COLOR(2,9,1)
3250 CALL COLOR(3,2,13)
3260 CALL COLOR(10,16,9)
3270 CALL COLOR(11,16,13)
3280 CALL COLOR(12,2,9)
3290 CALL SOUND(-10,900,1)
3300 CALL COLOR(2,13,1)
3310 CALL COLOR(3,2,9)
3320 CALL COLOR(10,16,13)
3330 CALL COLOR(11,16,9)
3340 CALL COLOR(12,2,13)
3350 IF S=0 THEN 3230
3360 IF K=ASC("Y") THEN 40
3370 M$="@GOODBYE#@#H"
3380 FOR I=1 TO LEN(M$)
3390 CALL HCHAR(23,I,ASC(SEG$(M$,I,1)))
3400 NEXT I
3410 GOTO 3410

```

ZX81

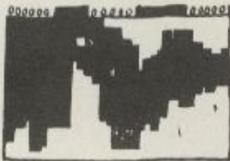
Games from ORWIN SOFTWARE

WHAT THEY SAID ABOUT CASSETTE 4

"quantity as well as quality" *Sinclair User*, Oct '82
 "If each game was on a separate tape and selling for £5 each I would still recommend them" *ZX Computing*, Oct/Nov '82
 "Easy to operate, graphically impressive and good value for money." *The Times*, 11th Dec '82
Now we have collected another set of 8 excellent games for Cassette 5

CASSETTE 4 8 games for 16K ZX81 £6

ZX-SCRAMBLE (machine code)



With 3 stages. Bomb and shoot your way through the fortified caves.

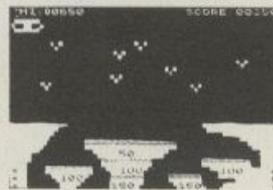
- GALAXY INVADERS (machine code)** Fleets of swooping and diving alien craft to fight off.
- SNAKEBIT (machine code)** Eat the snake before it eats you. Variable speed. (Very fast at top speed.)
- LIFE (machine code)** A ZX81 version of the well known game.
- 3D TIC-TAC-TOE (Basic)** Played on a 4 x 4 x 4 board, this is a game for the brain. It is very hard to beat the computer at it.
- GUNFIGHT (machine code)** Western style shoot-out between 2 players or against the computer.
- FUNGALOID (machine code)** Bomb the Fungaloids before they grow to the sky or shoot you down.
- INVADERS (machine code)** 49 aliens and random flying saucers to shoot down.



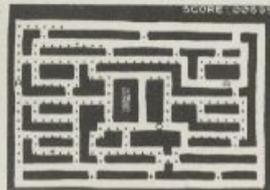
7 of the 8 games are in machine code because it is much faster than Basic. Some of these games were previously available from J. Steadman.

CASSETTE 5 8 games for 16K ZX81 £6

SPACE RESCUE (machine code)



BYTE-MAN (machine code)



BLITZ (machine code)



PLANETOIDS (machine code) Move your ship and fire missiles in 8 directions to avoid and shoot down the large planetoids and small fliers and bouncers. Rotate left, rotate right, move, fire and hyperspace controls.

DODGEMS (machine code) Dodge the computer's car while eating the dots.

DRAUGHTS (machine code) Play against the computer. Three skill levels.

MERCHANT (Basic) Make your fortune on trading voyages in the Mediterranean and beyond.

7 of the 8 games are in machine code because it is much faster than Basic.

SPACE RESCUE and BYTE-MAN were previously available from Mindseye.

CASSETTE 1, eleven 1K programs £3.80 (including 7 in machine code)

CASSETTE 2, ten 16K games in Basic £5

CASSETTE 3, eight 16K programs £5 (including 1 in machine code)

Please make your cheques payable to ORWIN SOFTWARE and send your order to:
 ORWIN SOFTWARE, Dept PCT, 26 Brownlow Road, Harlesden, London NW10 9QL

SEND SAE FOR DETAILED CATALOGUE
 SPECTRUM PROGRAMS WANTED

AB&C Computers

MAIL ORDER SPECIALISTS

SEND LARGE SAE FOR LISTS INSTANT CREDIT FOR CALLERS
 24 HOUR ANSAFONE FOR CREDIT CARD ORDERS

LEADING TEXAS STOCKIST

T199/4A Computer

- Cassette Cable
- Speech Synth
- TI Invaders
- Tombstone City
- The Attack
- Yahtzee
- Munchman
- Hangman
- Video Games
- Blasto
- CarWars
- Chess
- Music Maker
- Soccer
- Zero Zap
- Hustle
- Adventure/Pirate
- Adventureland
- Golden Voyage
- Savage Island
- Teach Y. S. Basic
- Teach Y. S. ExBas
- Ext. Basic
- Mini Memory
- TI Logo
- Editor Assy
- TI Writer
- Oldies & Goodies

XXX NEW XXX
 Parsec 31.95

XXX NEW XXX

Speech Synth Required
 We stock all items to expand your T199/4A. Please send for list and check our Super Deal Expansion Options. 99ER magazine now in stock. Limited Supplies 3rd party software stocked for TI. Send for latest TI list. SAE please

SERVICE CENTRE FOR DRAGON PRODUCTS

Dragon 32 175.00

- For latest developments on Dragon expansion call + disc + 64K RAM
- Beserk 19.95
 - Cosmic Invaders 19.95
 - Meteoroids 19.95
 - Ghost Attack 19.95
 - Cave Hunter 19.95
 - Starship Chamelion 19.95
 - Chess 24.95
 - Astroblaster 19.95
 - Calico Island 7.95
 - Computa Voice 7.95
 - Graphic Animator 7.95
 - Quest 7.95
 - Madness/Minio 7.95
 - Selection/Games 1 7.95
 - Pers Finance 7.95
 - Dragon Mountain 7.95
 - Typing Tutor 7.95
 - Flag 7.95
 - Black Sanctum 7.95
 - El Diablero 7.95
 - Escape 7.95
 - Flipper 7.95
 - Marsion Adv 7.95
 - Alcostraz II 7.95
 - Racer Ball 7.95
 - Space Moho 7.95
 - Space War 7.95
 - Scarfiner 7.95
 - Planet Invasion 7.95
 - Defence 7.95
 - Jerusalem/Adv 2 7.95
 - Williamsburg/Adv 3 7.95
 - Ultimate/Adv 4 7.95
 - Dragon Invaders 7.95
 - Storm 7.95
 - Phantom Slayer 7.95
 - Invaders Revenge 7.95
 - Donkey King 7.95
 - Katterpillar 7.95
 - Cosmic Zap 7.95

- Talking Android 7.95
- Backgammon 7.95
- Galactic Ambush 7.95

Program Packs 1 to 5 each 7.95

- Light Pen 11.95
- Jousticks (Pr) 19.95
- Cassette Lead 2.70
- Ed Assy Cass 10.95
- Ed Assy ROM Call

XXX NEW XXX

TELEWRITER Dragon 32 Word Proc. recommended value at 49.95 cass

XXX NEW XXX

3rd party software stocked for Dragon. SAE for list of all Dragon products.

- Colour Genie 194.00
- Joysticks 49.95
- RAM Expansion 38.50
- Printer I/F 39.50
- Light Pen Soon
- Space Fighter 6.85
- Racing Driver 10.06
- Golden Baton 10.06
- Time Machine 10.06
- Arrow of Death Ptl 10.06
- Arrow of Death Ptl 10.06
- Escape from Pulsar 10.06
- Circus 10.06
- Feasibility Exp 10.06
- Machine Code Mon 26.57
- File Handling 15.93
- The Exterminator 7.95
- Fortress of Evil 7.95
- Graphics Master 7.95
- Skramble 8.95
- Gemmon 12.95
- Galactic Attack 7.95
- Trach Y. S. Basic 6.95
- Invaders from Space 9.20

Genie software expanding. Send SAE for latest list. All Genie products stocked including Genie 1 & 2 and accessories and software.

Sinclair ZX81 and Spectrum. All hardware stocked. Software too numerous to list here. Send SAE for latest list.

SILLY SUMMER SALE SEND LARGE SAE FOR DETAILS

Wide range of Commodore software stocked. Send SAE for latest list including vast range of 3rd party software.

Commodore 64 Call
 Grave Robbers 8.69
 Montpole 8.69
 Adventure Pack 6.69
 More arriving soon. Send SAE for list.

Lynx 48K 225.00
 Oric 48K 169.95
 Sharp MZ80A 546.25
 Jupiter Ace 89.95
 BBC Model A & B + Add ons SOON

Seikosha GP100A 229.94
 Seikosha GP100VC 247.25
 Seikosha GP250C 274.85
 Brother EP20 219.95
 Smith Corona TP/I 557.75
 Brother HRI 747.50
 NEC PC8023 458.85
 Epson MX80T3 378.35
 Epson MX80FT/3 424.35
 Epson MX100/3 539.35
 Epson 438.00
 Epson RX80 238.00

Wide range of I/F and cables available. Call or send SAE.

- Prince 12" Mon 98.90
- Sanyo 12" Mon 90.85
- Sanyo 14" C Mon 286.35
- EACA 12" Mon 85.00
- 14" C Portable 229.95
- Cass Recorder 29.95
- DR101 Special Recorder for Micros 44.85

Wide range of Micro Computer accessories stocked. Disks, tape, paper etc. in stock.

- Atari 400 159.95
- Atari 800 48K 399.99
- Atari Prog Rec 49.45
- Prog Kit (Basic) 39.99
- Pacman 299.00
- Conversational French 39.99
- Conv Italian 39.99
- Conv German 39.99
- Conv Spanish 39.99
- Pacman 29.99
- Missile Command 29.99
- Centpede 29.99
- Star Raiders 29.99
- Sub Commander 34.44
- Jumbo Jet 34.44
- Soccer 29.84
- Home Finance 19.49
- Darts 19.49
- Snooker 19.49
- Pool 19.49
- Labyrinth 23.55
- Clovens & Balloons 23.55
- Chicken 27.50
- Dodge Racer 27.50
- Picnic Paranoia 27.50
- Shooting Arcade 23.55
- Apple Panic 23.55
- Shamos 27.50
- Slime 27.50
- Zork Disk I/II/III 31.40
- Graphic Master 31.40

Wide range of 3rd party software for Atari Computers. Send SAE for latest list.

BOOK LIST

Wide range of books stocked. Popular titles shown here. Send for book list.

- Intro 8080/8085 Alg 5.95
- Basic Comp Prog Home 8.70
- TRS80 Colour Basic 6.75
- Atari Sound & Graphics 6.75
- Basic Comp Games 6.95
- Zap Pow Boom (VIC) 7.95
- Jupiter Ace Forth Computer Graphics 6.95
- Spectrum Graphics Working Spectrum 6.95
- 63 Games Spectrum 4.95
- Cyber Spectrum 6.95
- The ZX Spectrum 5.95
- Prac Prog BBC/Atom 5.95
- BBC Teach You Prog 6.45
- BBC Revealed 7.95
- Ap BBC Computer 8.95
- Big Guide Micro 3.95
- Computing Is Easy Intro Micro Prog 5.80
- TRS 80 Basic 5.95
- Intro TRS 80 Basic 4.95
- 33 Progs Dragon 4.95
- 101 Colour Comp 5.95
- Working Dragon 5.95
- 32 Hour Basic 5.95
- 35 Progs T199/4A 5.95
- Intro TI Basic 9.50
- Prog TI Basic 16.95
- Bling Into ZX81 4.95
- 6803 Cookbook 5.60
- Microsoft Basic 8.95

Software available from leading houses. Callers welcome.

STOP PRESS

New Pointmaster Joysticks for Atari & VIC only £14.95 each.

All prices include VAT. Program prices include carriage — hardware 3% of order value valid for cover date — Call for latest. E & OE.

AB&C COMPUTERS, DUCHY HOUSE, 6 LOWER AYLMEY SQUARE (PCT), ST AUSTELL, CORNWALL TEL: 64463 (0726)

For every £30 spent on programs, we will give you a £2 voucher redeemable on your next program order.

Sinclair Special

1



**Inside...
Latest prices round-up...
Latest software...
Order form...**

Introduction

One thing's certain about the Sinclair world – there's never a dull moment.

Every month sees new software and new hardware, produced by Sinclair enthusiasts, or produced by Sinclair itself.

The magazines do a fantastic job of keeping you up to date with the input of enthusiasts. We want to keep you in touch with Sinclair's own developments.

Every month, there'll be a Sinclair Special in this magazine.

Sometimes, inevitably, there won't be anything new to say – we want to break away from the breathless announcements of hardware and software you just can't buy.

But when something new *is* available, we want you to have accurate information – fast. You'll find it here.

This month, we're giving you the latest information on the recommended retail prices of Sinclair equipment. They're *our* prices, and you may well find things cheaper (or dearer) in the shops. If they're cheaper – terrific! Snap them up. Note, however, that from us the ZX81 is down to £39.95.

We're also announcing six superb new Sinclair cassettes for the Spectrum, and three more which make full use of the ZX81. There's an order form at the back of this Special.

Next month... but there, next month is another story! Watch (as they say) this space.

Nigel Searle

Nigel Searle,
Managing Director,
Sinclair Research Ltd.



Spectrum – latest recommended retail prices.



16K was £125.00

16K now £99.95

48K was £175.00

48K now £129.95

ZX Printer was £59.95
ZX81 was £49.95

ZX Printer now £39.95
ZX81 now £39.95



Six new ways to make more of your Spectrum.

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

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

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

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

(SCRABBLE trademark and copyright licensed by Scrabble Schutzrechte und Handels GmbH - a J.W. Spear and Sons PLC subsidiary.)

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

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

Small Business Accounts Speeds and simplifies accounting work, produces Balance Sheets, Profit and Loss information and VAT returns. Complete with User manual. For 48K RAM Spectrum.

Overleaf - your Sinclair order form.

Three new ways to get the best out of your ZX81.

The range of Sinclair software for the ZX81 continues to grow.

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

Sabotage Defender or attacker? The choice is yours in this exciting game.

Be the Guard and defend the randomly placed boxes of ammunition inside the compound – or be the Saboteur and attack the ammunition!

Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

City Patrol You are the Commander of a laser-firing ship. Your task is to intercept and destroy alien suicide ships descending on your city. Judge your rating as Commander by how many aliens you destroy and how much of your city survives.

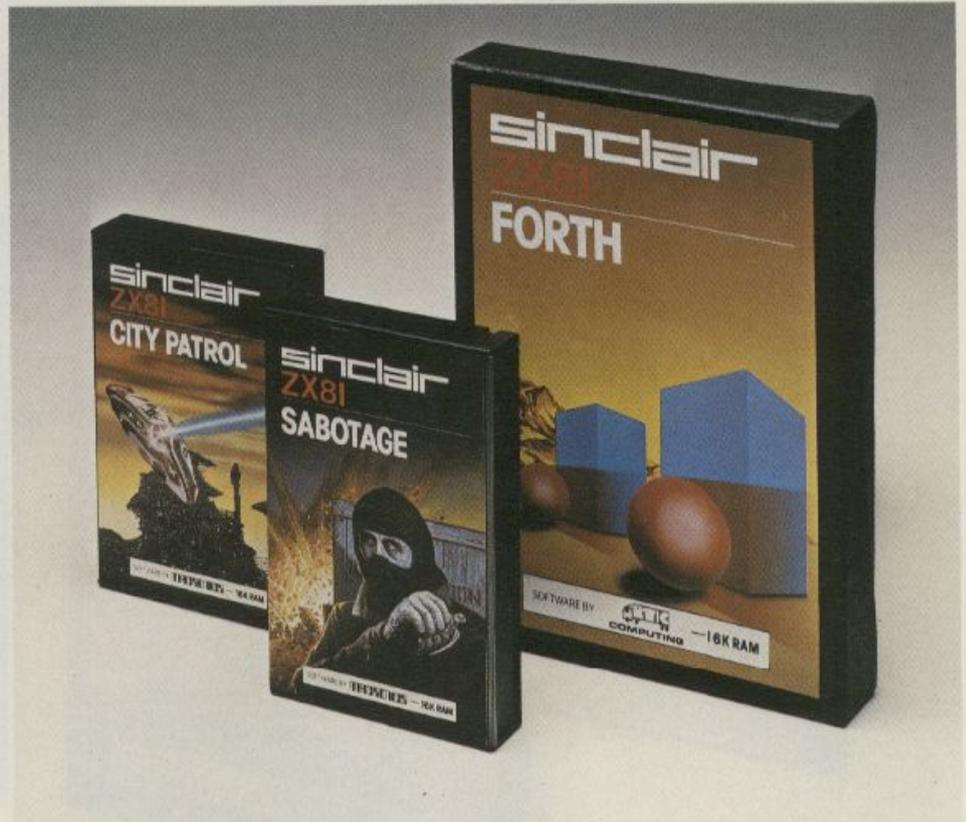
Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

FORTH Discover a new programming language which combines the simplicity of BASIC with the speed of machine code.

FORTH's compiled code occupies less than a quarter of the equivalent BASIC program and runs ten times as fast. It is fully extendable by the addition of user-defined commands.

Free User-Manual and Editor Manual with each cassette.

Written by Artic for a ZX81 with 16K RAM. Cassette price: £14.95.



How to order

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

sinclair

Sinclair Research Ltd,
Stanhope Road, Camberley,
Surrey, GU15 3PS.
Telephone: (0276) 685311.

To: Sinclair Research Ltd, FREEPOST, Camberley, Surrey, GU15 3BR.

ORDER FORM

Section A: hardware purchase

Qty	Item	Code	Item Price £	Total £
	ZX Spectrum – 46K	3000	129.95	
	ZX Spectrum – 16K	3002	99.95	
	ZX 81 (including 1.2A Mains Adaptor)	1003	39.95	
	16K RAM pack for ZX81	1010	29.95	
	ZX Printer	1014	39.95	
	1.2A Mains Adaptor, for use with ZX81 computer/ZX Printer combination (only required if you have an early ZX81 with 0.7A Adaptor)	1002	7.95	
	Printer paper (pack of 5 rolls)	1008	11.95	
	Postage and packing: orders under £90	0028	2.95	
	orders over £90	0029	4.95	
			TOTAL £	

Section B: software purchase

Qty	Cassette	Code	Item Price £	Total £
FOR SPECTRUM				
	G22/S: Backgammon	4021	5.95	
	G23/S: Cyrus-IS-Chess	4023	9.95	
	G24/S: Horace & the Spiders	4022	5.95	
	G25/S: Scrabble	4024	15.95	
	L1 /S: FORTH	4400	14.95	
	B6 /S: Small Business Accounts	4605	12.95	
FOR ZX81				
	G25: Sabotage	2124	4.94	
	G24: City Patrol	2123	4.95	
	L1: FORTH	2400	14.95	
			TOTAL £	

*I enclose a cheque/postal order made payable to Sinclair Research Ltd for £ _____

*Please charge to my Access/Barclaycard/Trustcard account no: _____

*Delete/complete as applicable. _____

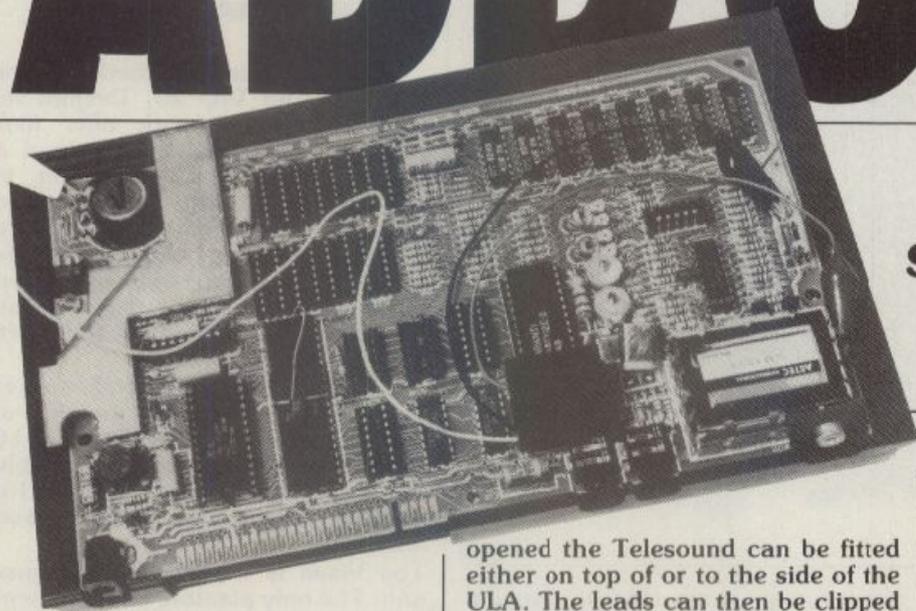
(Please print)

Signature _____ Mr/Mrs/Miss _____

Address _____

PERIPHERALS

ADDONS



Telesound 84

Anyone who has a Spectrum must now be tired of straining to hear the plaintive beeps that emanate from its internal speaker. Somehow Space Invaders doesn't sound right without the thunderous sounds of a space battle to complement it. A Redditch based company, Compusound, have come up with a cheap way in which you can increase the volume, if not the quality of your Spectrum's sound.

The unit they have produced is called the Telesound 84. It fits inside the Spectrum case and taps off the signal to the Spectrum's internal speaker and feeds onto the video signal, enabling you to hear the sound through your television speaker. Simple idea this and it works!

The Telesound 84 takes the form of a small plastic cube which contains the conversion circuitry and three leads, each terminating with a crocodile clip. The package comes supplied with full fitting instructions which include a diagram of where to place the unit and where to connect the leads. The instructions also contain a music program.

To fit the Telesound you must open the Spectrum case, taking care not to displace the ribbon connectors from the keyboard. Once

opened the Telesound can be fitted either on top of or to the side of the ULA. The leads can then be clipped to the appropriate places. This is my major criticism of the unit. The clips that terminate the leads are too big to fit inside the case once it is closed. Also, on the Spectrum I fitted it to, the wiring on the board was cut so close it left you very little room to fit the clips anyway.

Seeing that Spectrums are the sort of computers that are likely to be moved around I would think it would be better to carefully solder the connections and dispense with the clips altogether. This would prevent them from coming loose during transit and causing a short circuit when the computer was next used.

When I did get my unit fitted it worked well. There was a little bit of background noise on the signal, but seeing how the Spectrum was never intended to produce this kind of signal, this is acceptable. Unlike other sound expansion units for the Spectrum, the Telesound will work with any software that uses the Spectrum's own internal speaker, making it instantly usable with all commercial software.

In conclusion, the Telesound 84 is a useful addition to any Spectrum but a great deal of care must be taken when fitting it. Further details can be obtained from: Compusound, 32 Langley Close, Redditch, Worcs B98 0ET Tel: 0527-21439. The Telesound 84 costs £9.95 inclusive of packing, postage and a sound effects program.

Give your VIC, Spectrum and Ace peripheral power

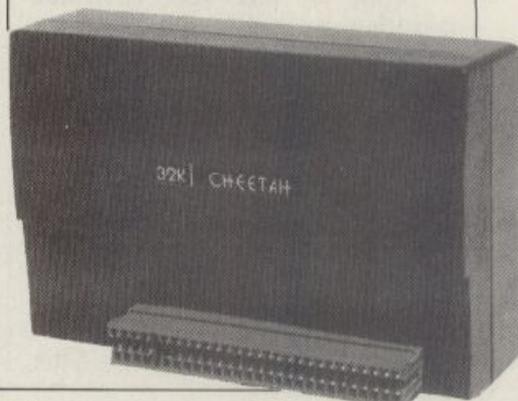
Cheetah Spectrum RAM Pack

The Cheetah RAM pack fits onto the expansion connector at the back of the Spectrum. It provides an extra 32K of memory, expanding the 16K Spectrum. It provides an extra 32K of memory, expanding the 16K Spectrum up to 48K.

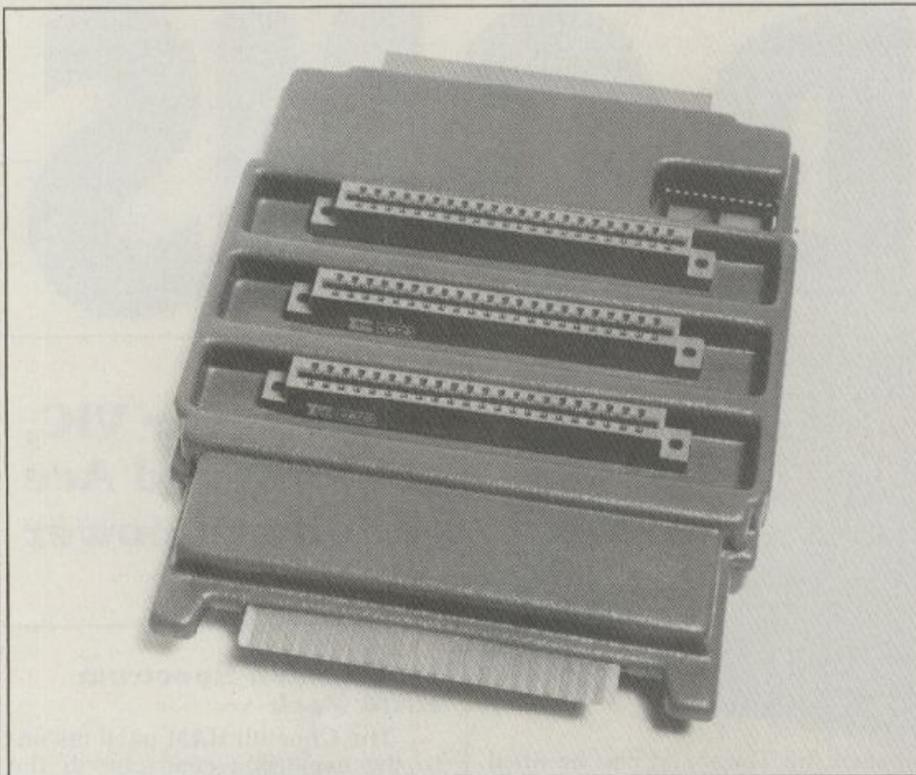
The unit is encased in a tough, black plastic moulded case which fits snugly onto the back of the Spectrum. It features a good quality edge connector which should stand up well to wear and tear. On the back of the pack is a repeat of the Spectrum's edge connector. This enables you to connect other peripherals such as printers to the Spectrum.

The RAM pack worked well when fitted and provides a good way to upgrade your 16K Spectrum, especially if you don't want to open it up and muck about inside.

Further details are available from Cheetah Marketing Ltd, 359 The Strand, London WC2R 0HS. Tel: 01-240-7939. The Cheetah 32K RAM pack costs £39.95.



ADD-ON ACTION



Vixen Switchable RAM Pack

One of the biggest problems with fitting expansion to the VIC-20 is that the VIC has to be told by the cartridge which block of memory the expansion memory is to be placed. On most cartridges this selection is 'hard-wired' into the cartridge. This has led to problems with cartridges clashing over the same memory space and problems when further expanding the VIC's memory.

Stonechip electronics have produced a 16K memory expansion cartridge which should alleviate these problems. The Vixen 16K RAM pack is the same shape and size as normal VIC cartridges, but recessed into the front of the case are two, two position switches. These switches allow the cartridge to be set into any one of four modes.

Mode 1 has the cartridge operating as a full 16K memory cartridge by placing 8K in each of expansion blocks one and two. Mode 2 sets up the cartridge as one 8K block and one 3K block. The 8K sits in block 1 and the 3K sits in the 3K expansion area. Mode 3 is 3K only, which sits in the 3K expansion area. In this mode the 8K is also present but it is not seen by the computer. The final mode, Mode 4, places 8K in blocks 2 and 3.

When used in this mode the computer does not access the

memory in these blocks, so in essence this setting reduces the VIC to a standard configuration without having to remove the cartridge. Two of these cartridges can be used to bring the VIC up to its maximum memory size.

The cartridge is fitted with a good quality edge connector and is housed in a tough moulded plastic case.

The Vixen represents a thoughtful approach to the subject of VIC memory expansion and will be a great help to any VIC owner who has to use his computer in a

different number of memory sizes. Further details of the Vixen can be obtained from Stonechip Electronics, The Brook Industrial Estate, Deadbrook Lane, Aldershot, Hampshire. Tel: 0252 318260. The Vixen costs £44.95

Vixen Expansion System

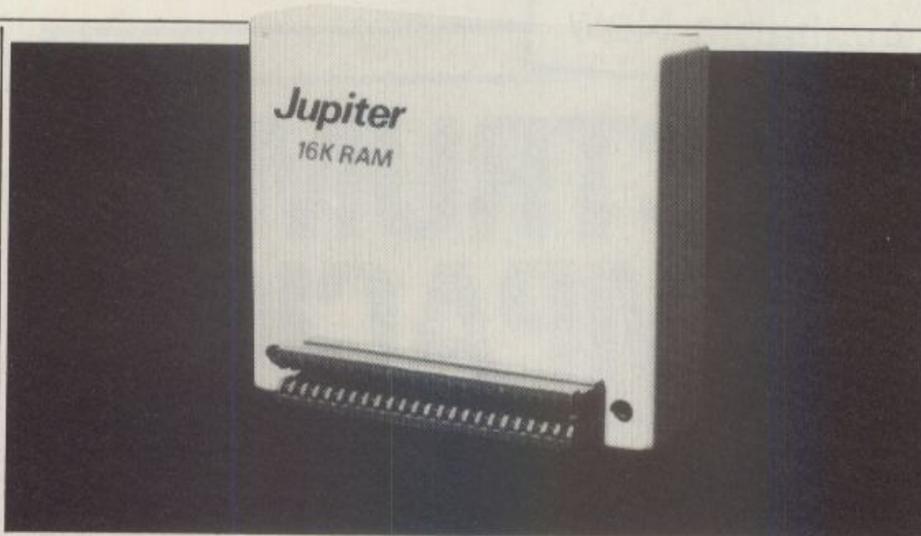
The Vixen is a motherboard for use with the VIC 20. Despite its name it does in fact offer four cartridge expansion sockets and a ROM chip socket. The unit is designed to fit into the cartridge expansion socket on the VIC. Three of the cartridge connectors are mounted in recessed wells on the top of the unit. The fourth is placed on the back of the unit. All of these are good quality connectors.

The Vixen has a 2K ROM socket recessed at the back-right side of the unit. This will accept a type 2716 ROM and therefore will be suitable for use with most of the commercially available ROM based utilities.

The Vixen is a plain, no-nonsense unit. The only possible improvement which could have been made to it is the inclusion of switches to enable the cartridge slots to be selected individually. This would have reduced wear and tear of the cartridge connectors by letting you remove a cartridge from the VIC's memory without having to unplug it.

Further details on the Vixen can be obtained from Stonechip Electronics, The Brook Industrial Estate, Deadbrook Lane, Aldershot, Hampshire. Tel: 0252 318260. The Tandem expansion unit costs £29.95.





Jupiter 16K RAM

From the people who brought you the Jupiter Ace comes a 16K RAM expansion. Designed specifically for use with Ace, this pack draws a lot of its styling from the earlier ZX81 RAM packs.

Slightly larger than a cigarette packet, the RAM pack is finished in a light grey colour and sports the Jupiter logo printed on the front. The construction is solid and the sturdy edge connector should prevent it from suffering from the wobble problems which plagued early ZX81 packs.

The instructions which come with the pack are brief but concise. Included with them is a short FORTH routine which will enable you to test what size memory your Ace has in order for you to check

whether the unit is working correctly.

The Jupiter 16K RAM pack costs £39.95 including VAT and further details can be obtained from Jupiter Cantab Ltd, 22 Foxhollow, Bar Hill, Cambridge CB3 8EP or telephone: (0223) 313479.

Interpod

One of the problems with the VIC is that you are tied to using Commodore peripherals if you want to add a disc drive or a printer to your system. The Interpod unit from Oxford Computer Systems provides a selection of output ports to enable the use of a wide range of peripherals.

Interpod takes the form of a podule moulded out cream coloured plastic. Set into the back of the unit

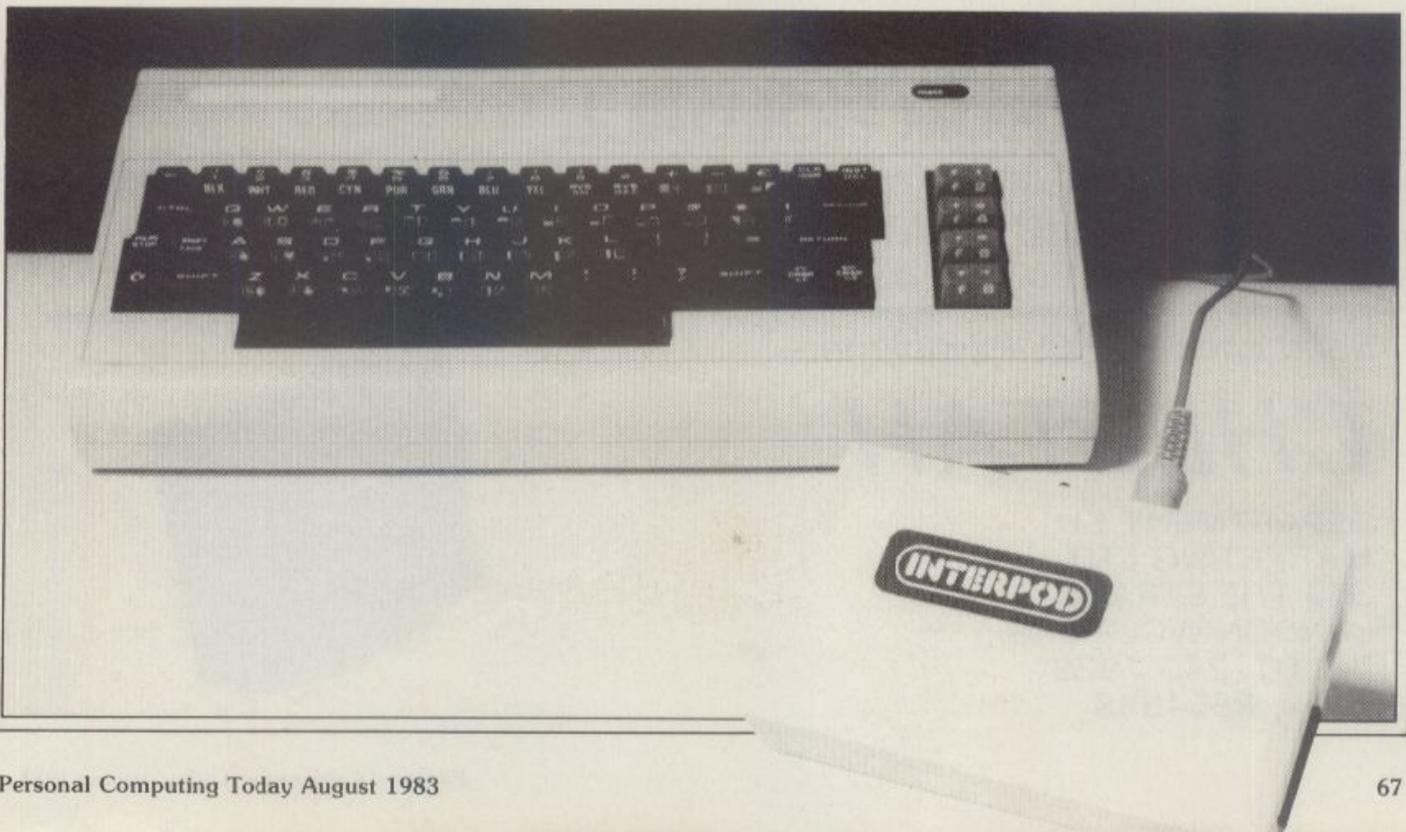
are connectors for an IEEE connector and two DIN connectors. Into one of these you plug either a VIC or a Commodore 64 and into the other you can plug an IEEE serial device, such as the VIC disc or printer. The full IEEE socket can support any IEEE compatible device. This makes all the the Commodore PET peripherals available for use with the VIC.

On the right side of the unit is a socket for the external power supply to plug in. On this side as well is the RS-232-C interface. Using this you are able to connect your VIC or 64 to any compatible RS-232 device. The opens up a whole field of printers and associated devices.

On power up Interpod performs a self-test at the end of which a small red LED will indicate the operational status of the unit.

The manual supplied with the unit contains enough details for you to get Interpod up and running. It also contains example programs showing operation of both RS-232 and IEEE devices. The Interpod is capable of producing error messages and these are explained as well. The manual finishes by giving you pin-out specifications for both the IEEE and RS-232, thus enabling you to work on your own interfacing projects.

The Interpod costs £125.00 and further details are available from Oxford Computer Systems (Software) Ltd, Hensington Road, Woodstock, Oxford OX7 1JR. Tel: 0993 812700.



The Cheapest Rampacks In The World

Available Now

ZX SPECTRUM 32K RAMPACK

Simply plugs into user port at rear
of computer and increases your
16K Computer instantly to 48K

£39.95

- Fully Compatible with all accessories.
- No need to open computer and invalidate guarantee.
- Why send your computer away and wait weeks for upgrade,
- Fully cased, tested and guaranteed.

ZX81 16K RAMPACK _____ £19.75

ZX81 64K RAMPACK _____ £44.75

JUPITER ACE 16K RAMPACK _____ £24.95

All Units: Fully Cased and Guaranteed. Secure No Wobble Design.
Fully Compatible with all accessories.

ZX SPECTRUM HOLDALL To protect your computer

from dust, dirt and grime. During storage and transport. **£7.99**

PRICES INCLUDE VAT and P&P. Delivery normally 14 days.
Export orders at no extra cost.

Send cheque/P.O. Payable to:—

CHEETAH

DEPARTMENT SU
MARKETING LTD
359 THE STRAND
LONDON WC2R 0HS
Tel: 01-240 7939
Telex: 8954958



LOOK FOR THE
ULTIMATE
SIGN FOR THE
ULTIMATE GAMES



**PSSST for 16 or 48K
SPECTRUM**

Little vermin, leave my plant alone. Oyl My plant's dying. No! No! Nasty bugs sucking the life from my Thyrogodion Megga Chironthodid, making her shrink, will and die. I'll soon put a stop to their little game, quick Spray-O. This'll sort 'em out, there! Take that and that 'ol Hat Mustn't die, mustn't die. It's got to flower, it must do. It said on the packet, "Takes between two and five minutes and then the leech laser. Quick, Quick. They breed so fast, can't hold them back for long. Hurry! ... Hurry! ... Arragga! ... Why! you little, little ... Hurry! ... Arragga! ... Arragga! ... The ULTIMATE Challenge. PSSST ... The ULTIMATE Challenge. Now you know why 'ULTIMATE PLAY THE GAME' ... Go grow yourself a REAL game all those features you come to expect from the ULTIMATE GAME people. Design: 'ULTIMATE PLAY THE GAME'

JET PAC for 16 or 48K SPECTRUM

The 'Acme Interstellar Transport Company' is delivering Spaceship kits to various planets throughout the Galaxy, and as chief test pilot, all you have to do is assemble the Rockets and thrust on to your next destination. But as you don't often get the chance of a free trip across the Galaxy and space travel is, oh, so expensive, now's your chance to get rich! You might just as well stop off on several planets on your journey, back with the very latest precious gems, elements or gold, and take them back with you. Upon landing you will find yourself equipped with the odd sack of Hydrovac Phasers, to blast any nasty, mega, little aliens who might object to your visit. And my! do these aliens get upset, when you collect all of their valuables, and sneak off, without so much as a by-your-leave. JET PAC plus mega, powerful, Quad Photon Laser JET PAC Arcade-standard, 100% machine code, incredible sound effects, amazing smooth high resolution visual graphics, the totally new, addictive concept and all those extra features you expect from the ULTIMATE GAME people. Now you know why 'ULTIMATE PLAY THE GAME' Design: 'ULTIMATE PLAY THE GAME'

Dealership enquiries welcome, phone (0530) 411485

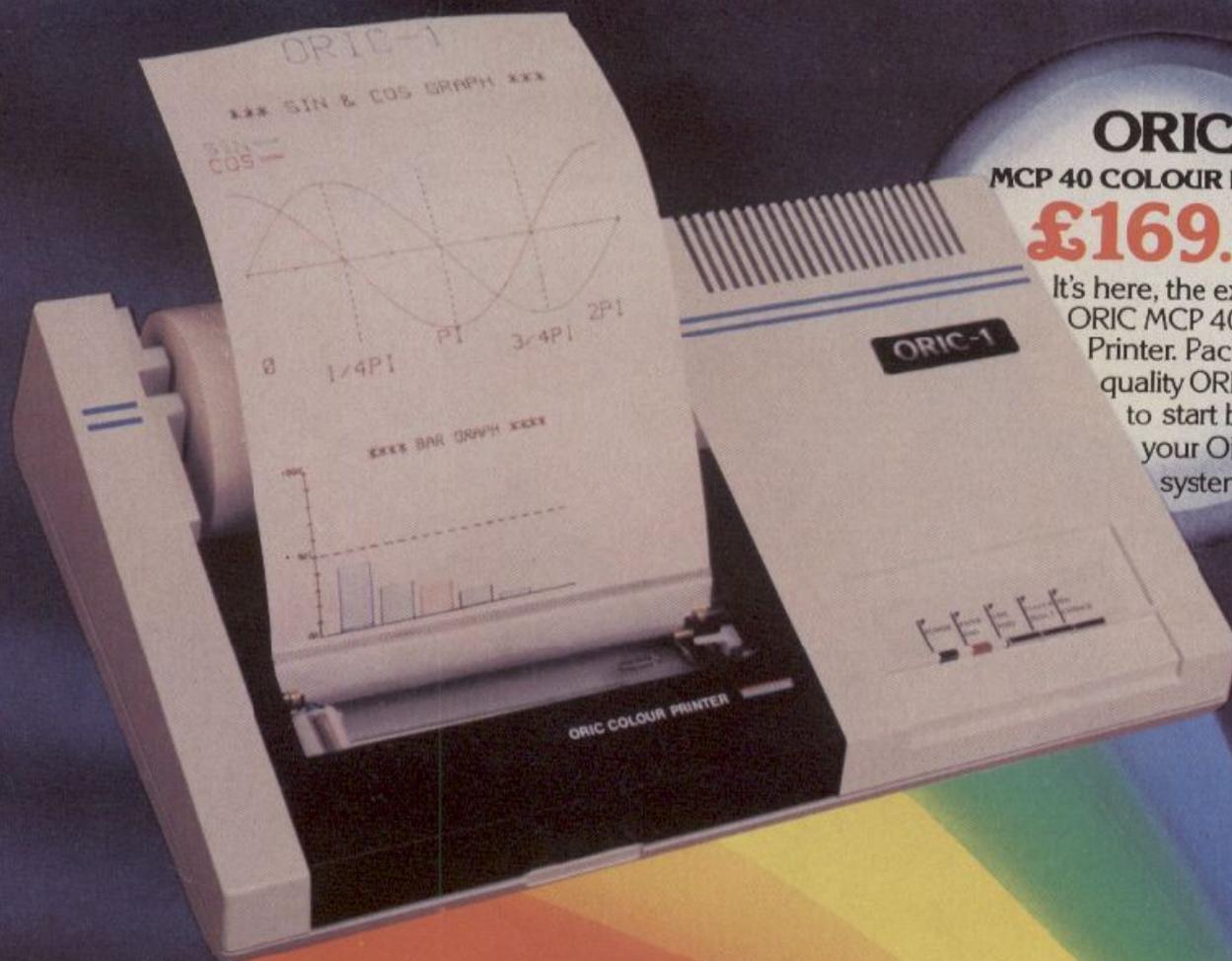


These games should be available from **W. H. SMITH, JOHN MENZIES, BOOTS,** other larger department stores and all major software retailers, alternatively send the coupon to **ULTIMATE PLAY THE GAME** for immediate dispatch. Subject to availability, you should receive your order within 3 days of posting.
£5.50 each
including VAT, first class postage and packing

Post this coupon now, to **ULTIMATE PLAY THE GAME** The
Green, Ashby de la Zouch, Leicestershire LE6 5JU
Please send me the following:
 JET PAC **PSSST**
 KEMPSTON joystick information
I enclose PO/cheque for £
Name
Address

ULTIMATE PLAY THE GAME is a trade name of Ashby de la Zouch Computers & Graphics Ltd.

ORIC MCP 40 COLOUR PRINTER



ORIC
MCP 40 COLOUR PRINTER

£169.95 incl.VAT.

It's here, the exciting new ORIC MCP 40, Colour-Printer. Packed with quality ORIC features to start building your ORIC system.

Superbly styled and quality engineered to provide 4 colour hard copy, for home and business use.

Just look at these leading features:

- **Quality hard copy on plain paper**
- **Superb graphics and text capability**
- **Prints 4 colours – Red, Green, Blue and Black**
- **Designed to match the futuristic style of ORIC 1**
- **Plugs straight into your ORIC – printer lead supplied**

ORIC

The ORIC MCP 40 – Setting new standards in Micro Computer Printers. ORIC The Real Computer System

ORIC PRODUCTS INTERNATIONAL LTD Coworth Park Mansion, Coworth Park, London Road, Sunninghill, Ascot, Berks. SL5 7SE

ORIC products available from:-
WH SMITH · DIXONS · GREENS · LASKYS · MICRO'C'
· MICRO PERIPHERALS · SPECTRUM · COMPUTERS FOR ALL
and hundreds of independent dealers.

ORIC-1 16K & 48K



**ORIC-1 16K
VALUE PACK**
ORIC 16K plus £30*
worth of ORIC Software
for ONLY
£129.95 incl.VAT.

*TEACH YOURSELF BASIC
HOME FINANCE ORIC FLIGHT
MULTI-GAMES



**ORIC-1 48K
VALUE PACK**
ORIC 48K plus £40*
worth of ORIC Software
for ONLY
£169.95 incl.VAT.

*TEACH YOURSELF BASIC
HOME FINANCE ORIC FLIGHT
MULTI-GAMES

ORIC 1 16K & 48K Micros

- **Superb Styling**
- **Ergonomic keyboard with 57 moving keys**
- **28 rows x 40 characters high resolution**
- **Teletext/Viewdata compatible graphics**
- **6 Octaves of real sound plus HI*FI output**
- **Centronics printer interface and cassette port**
- **Free user manual, cassette recorder lead and Driver game included.**

ORIC 1 Today's best value in real computer systems.

To be launched within the next few weeks - the revolutionary **ORIC 3" MICRO FLOPPY DISK DRIVES**, with incredible access time and data storage capacity.

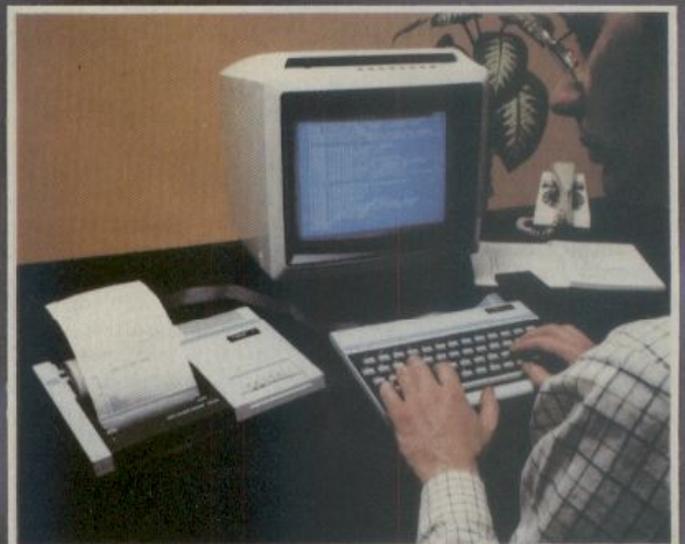
Other peripherals to be launched this year...

It is Oric's policy to continue to expand our product range, in order to offer our customers a comprehensive, professional, Micro Computer system, at a realistic price.

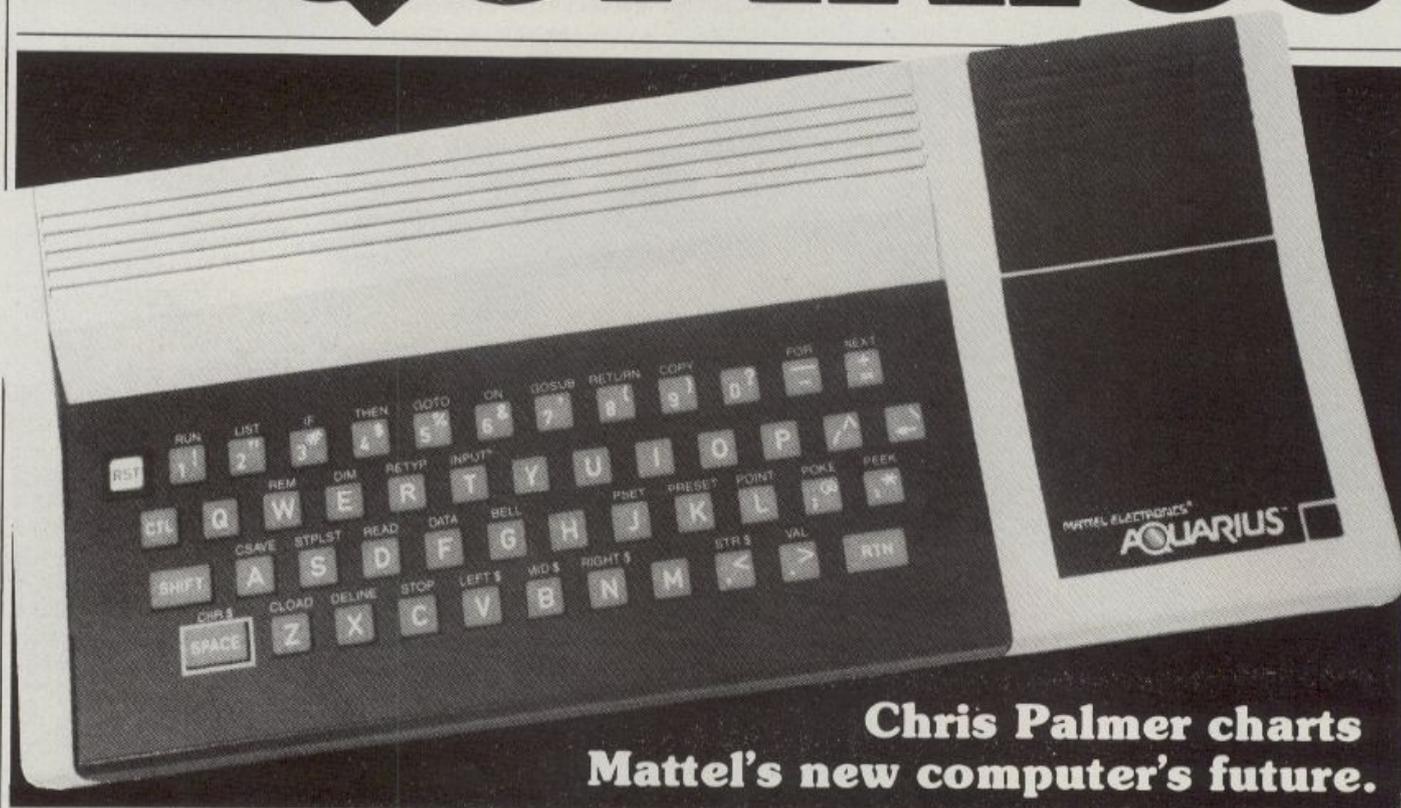
We believe that with the launch of our MCP 40 colour printer, and our combined computer/software value packs, we will continue to lead the small micro market in both quality and value.

*Titles may vary subject to availability but the approximate value will not.

© Copyright ORIC PRODUCTS INTERNATIONAL 1983



AQUARIUS



**Chris Palmer charts
Mattel's new computer's future.**

Until recently, the design and manufacture of home computers has been the domain of those companies whose roots lay in the electronics industry. The past year has seen an increase in interest from larger companies who have previously only dabbled with simple electronic games. First on the scene was the Mettoy sponsored Dragon 32 and following close on their heels is the subject of our review — Mattel Electronic's Aquarius.

Prior to the launch of the Aquarius, Mattel had made their name as one of the leading manufacturers of action toys. Their first serious dabblings with computer-style electronics resulted with the much acclaimed Intellevision games machine. Whilst there was a lot of talk about providing a keyboard for the Intellevision which would convert it into a computer this now looks unlikely with the arrival of the Aquarius.

Right. Enough of the history lesson, lets look at the Aquarius. The first thing that strikes you on

seeing the Aquarius is that the packaging is of a high standard. The outer box sports full colour pictures and graphics along with lists of all the add-ons. This is obviously designed to sell the computer without you even opening the box.

The box contains the computer, power supply, keyboard overlay, instruction manual, instruction cards, 10ft television cable and one of those switchboxes which lets you plug both the computer and the aerial into the television and switch between them. All you need to do is supply a mains plug and you are ready to start.

Despite adverse comments from some colleagues, I quite liked the styling of the Aquarius. Its angled back and two tone colour scheme apply a stylish yet rugged appearance. Around the back you have sockets for connecting the printer, cassette and television. There is also a channel selector, but seeing as this is only needed for American TVs the switch is not present on the UK models.

The expansion cartridge slot is incorporated into the right side of the computer. When not in use the slot is protected from dirt and grime by a removeable cover. It's a nice idea and one which should be implemented on other computers that have expansion sockets. One small problem was that after a few removals it became loose which meant that more often than not the Aquarius was left without a cover.

Into the expansion socket can be fitted either program ROM cartridges or memory RAM cartridges. These are constructed to the same high degree as the rest of the unit and fit flush, preserving the unit's neat appearance. Because they literally become part of the computer when fitted I cannot foresee any problems of the 'wobbly RAM pack' type which plague other computers of this price.

Now for the bad news, Mattel have opted for a rubber keyboard on the Aquarius. Admittedly it is one of the better rubber keyboards I have tried, but in no way does it measure

up to a proper typewriter keyboard for speed and ease of use. This coupled with a touch of keyboard bounce make entering code or data from the keyboard a bit of a chore.

The keyboard is laid out in standard QWERTY fashion. The only diversions from normal are the lack of a space bar, which is replaced by a space key positioned where you would expect to find the left shift key and the movement of the RETURN key to the position usually occupied by the right shift key. A reset key is also provided and this is situated out of harms way at the top-left end of the keyboard. If your fingers should accidentally stray to the reset key extra safety is provided by a ridge around the key.

Provided with the computer is a keyboard overlay. This plastic sheet fits neatly over the keyboard and is held securely by two plastic tabs at the side. On this overlay is printed a selection of keywords and commands which can be accessed by using the appropriate key in conjunction with the control key. While not all the commands are present on the overlay you do get the ones most often used. The two game cartridges we had with the machine also included their own overlays for both keyboard and controller to indicate which keys are used in the control of the game.

Turning On

On now to the actual operation of the Aquarius. On powering up, the screen displays the message 'BASIC — Press RETURN key to start'. Pressing the RETURN key clears the screen and displays the copyright notice from Microsoft, for it is their BASIC that the machine uses. Following this comes the Aquarius OK prompt and a solid black cursor.

The BASIC is a plain and simple version of standard Microsoft. In fact it has a lot of similarities to Level II Tandy BASIC. The most glaring omission is total lack of any command to let you clear the screen. If you want to clear the screen you have to resort to printing CHR\$(11). On a machine with the rubber keyboard the last thing you want is to cause more typing than is necessary.

Having recovered from that minor irritation I ran straight into one of the Aquarius's larger drawbacks. The problem here is editing, or rather, lack of editing. To say that the Aquarius possesses editing facilities is really stretching

the definition to its limits. You have a delete key which can be used in immediate and program mode to delete one character at a time. If you are in the middle of a line and you decide that you don't want that line you can type 'CTL X' and this will abort that line. You are also given a RETYP command which will prompt you again with the current line number. If, however, you want to edit a line which is already in the computer's memory you're out of luck.

The Aquarius offers no facilities for inserting characters or deleting characters in a line which you have previously typed. The manual offers the following advice: 'If you want to make a change AFTER you press RTN, simply re-type the line.' Obviously the people who put together the Aquarius want you to get lots of practice typing on that lovely rubber keyboard!!!

Graphics and Sound

For a computer which is going to have to compete with the Oric and Spectrum for a place in the homes of Britain, the Aquarius doesn't have a lot going for it in terms of graphics, sound and colour. First the good news. The Aquarius contains a good set of pre-defined characters. These can be accessed by printing them using CHR\$() or by POKEing them to the screen. The character set includes several small men in different positions, as well as spaceships and aircraft. I was suprised to find no PRINT AT command as this would

have complemented the graphics well and would also have made life easier for the beginner. As it is, if you want to place something on the screen outside of a normal PRINT, you have to resort to POKEing it there.

POKEing is something that the Aquarius owner is going to have to do a lot of if he wants to write colourful programs. This is because the Aquarius contains no commands to manipulate colour on the screen. To expand a little, the screen on the Aquarius is serviced by two areas of memory. One of these contains the information for which character is to be displayed at a particular position, the other contains the information relating to the colour of that character. The process for placing a character in a certain area of the screen is as follows.

Decide where you want the character and what colour you want it to be. Using the screen memory map in the manual decide on which memory location corresponds to that position on the screen. POKE the code for that character into the memory. Use the formula given in the manual to calculate the required foreground and background colour for your character. Finally work out the corresponding position in the colour memory and POKE the colour into it. If you want to place a string of characters in colour on the screen then you have to start looping.

This system is alright for games because this is the way you would go about it on most micro's, but for



AQUARIUS

anything else it is an unnecessary chore. Admittedly, the Aquarius does offer a larger range of colours than most comparable computers, but when it is so difficult to access them it hardly seems worth it. If you wanted to change the background colour of the screen you have to, from BASIC, POKE each position of the colour memory with the new value for your background colour.

The high resolution graphics facilities on the Aquarius are also quite limited. To start with you only have a screen resolution of 80 x 72. To access this you have just three commands — PSET, PRESET and POINT. PSET turns on a block on the screen, PRESET resets it and POINT tests to see whether a block has been set. Once again you have to POKE any colour you want directly into the colour memory, having calculated the position of the block. These sort of archaic graphics were restrictive back in the days of the TRS-80 computer and have no place on current generation machines.

The sound capabilities are basic as well. You get a single sound command with two parameters — tone and duration. This works acceptably except for the fact that the duration increases as the note gets lower, so once again you have to resort to writing little formulae to maintain a constant duration whatever the pitch. One interesting point here is that the specification for the mini expander which can be fitted to the Aquarius says that the expander provides another two sound channels. Nowhere in the documentation does it say how you are supposed to access these yourself so I assume they are reserved purely for use by any cartridges that you plug into the computer.

Peripherals

Having arrived at the subject of peripherals for the Aquarius, things start to look up. It looks like the Aquarius will be well supported when it arrives in the shops. Memory expansion is available in the form of 4K and 16K RAM packs. These can be plugged into either the expansion unit or directly into the computer. The Aquarius is one of those machines which demands extra memory from the start. The standard computer contains 4K of memory, but after the operating system has taken memory for its own workings and for the screen and colour memory you are left with just 1731 bytes for your own programs.

Another peripheral which will be an obvious first choice is the Mini Expander. This chassis fits into the expansion port on the Aquarius. It provides one cartridge slot for extra memory and one for ROM based program cartridges. A nice feature of this unit is that both cartridge ports are fitted with spring loaded doors. These move out of the way when a cartridge is inserted and spring back into place when the cartridge is removed, effectively protecting the sockets from the ravishes of the outside world.

At the back of the Mini Expander are sockets which allow the two games controllers to be fitted. These controllers come supplied with the Mini Expander and are an upgraded version of the Intellevision controllers. Instead of opting for the more usual joystick control, Mattel have decided to stick with their 'Direction Discs'. These take a bit of getting used to but on some games they are better than normal joysticks. Each controller also has

six buttons which can be used for various functions within a game. Once again there was no mention made in any of the manuals as to how you could access these controllers yourself for use in your own programs.

Mattel are also producing a printer for use with the Aquarius. It is capable of producing text, graphics or both. It can be accessed from within programs by the LPRINT or COPY statements. The latter enabling you to make a direct copy of the screen.

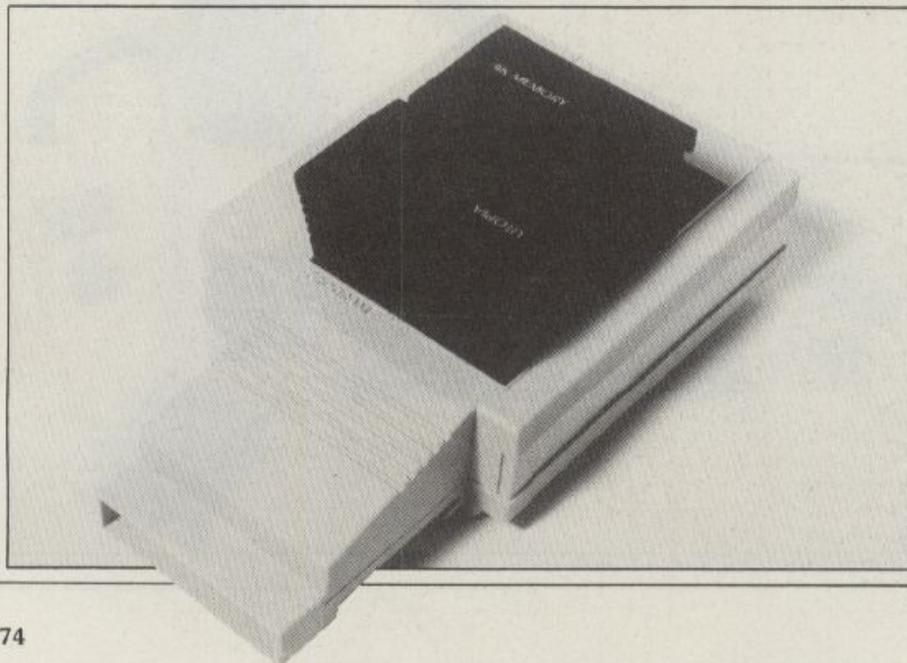
Other expansions that will be available for the Aquarius include a Data Recorder, a Modem cartridge for communications and a master expansion module which will allow the use of discs and the CP/M operating system. At the time of writing no prices had been set for any of these peripherals and all that could be said about the price of the Aquarius was that it was going to be under £100.

Software

At the moment all the software for the Aquarius is being produced by Mattel and will be available on cartridge. Titles will include the children graphic language LOGO and Extended Microsoft BASIC. This BASIC looks as if it might rectify some of the omissions I have mentioned in the standard BASIC, but this remains to be seen.

On the game front a lot of the software has been uprated from Intellevision versions. Titles include the Tron game, Deadly Discs, Snafu, Astrosmash and Burgertime. The latter is a rather intriguing game in which you have to make hamburgers while being menaced by hot dogs and pickles!

To round up, I must say I was disappointed with the Aquarius. I cannot see it competing with the Spectrum or even the Oric as a programmers machine. Like the TI 99/4a it really comes into its own when being used with pre-programmed cartridges be they games or business packs. If you are looking for a machine to explore the delights and frustrations of programming then you could do better than the Aquarius. You will find it is not capable of handling/producing complex programs. However, if you are looking for a computer to use in the passive sense than it might be worth your while checking out the Aquarius.



A VIDCOM CREATION

MIJID, BECAUSE YOUR PRODUCTS HAVE GROWN UP...

Video games: a 75% growth in 1982. A spectacular increase, giving food for thought! Home micro-computers and video games are nearing full-maturity. Having reached this stage of development, they can only strengthen their impact with the help of a vigorous commercial strategy. And thus Vidcom saw the need and created Mijid.

COINCIDING WITH VIDCOM, MIJID IS EXCLUSIVELY RESERVED FOR MICRO-COMPUTERS AND VIDEO GAMES

if you are a publisher, programmer or analyst, manufacturer or distributor, the success of your products will be enhanced by attending Mijid.

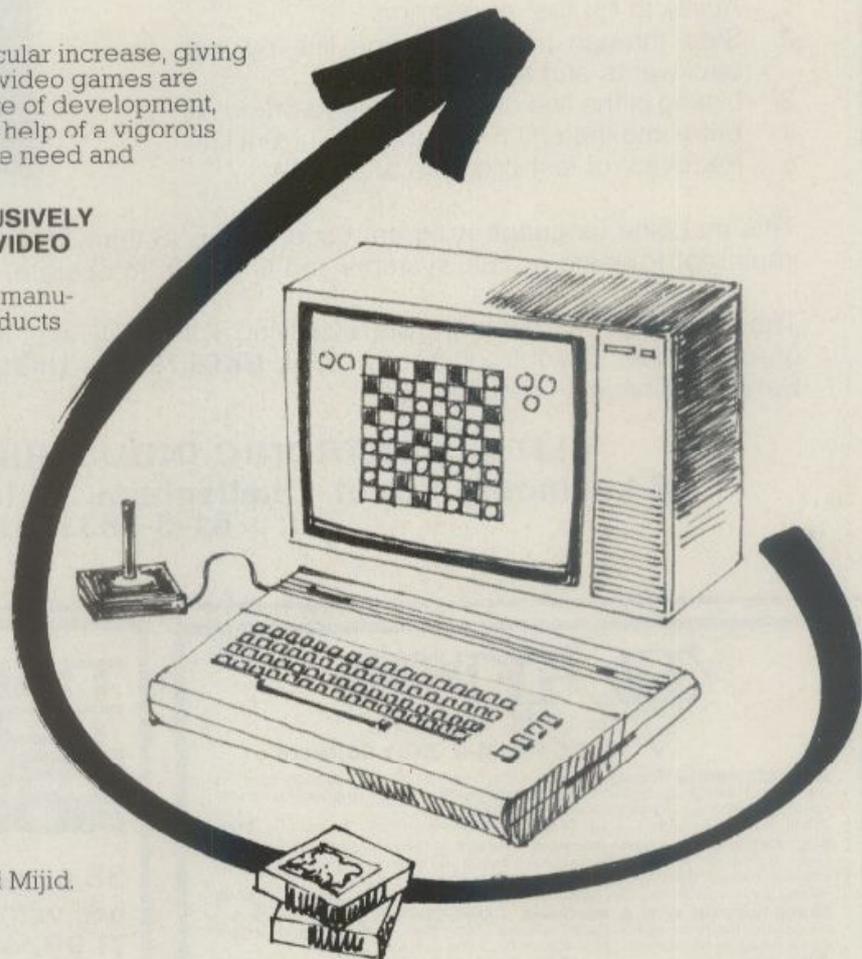
FIVE DAYS IN WHICH TO MEET PROFESSIONALS FROM AROUND THE WORLD

retailers and distributors creating and developing their sales networks; producers, from all domains of the software industry, looking for new programming ideas; writers and programmers negotiating rights for promotion, adaptation and distribution; international journalists, there to report on your new products.

MIJID IS A VIDCOM CREATION

and there is a strong tie between these two shows. It's normal: their interests are complementary. Furthermore, the professional attending Mijid will be able to count themselves among the regular, prestigious Vidcom attendance. A solid guarantee for contacts and contracts.

Get ready for the next surge of growth, attend Mijid.



Mijid

MIJID AND VIDCOM: A COMMON PASSPORT TO NEW COMMUNICATIONS

The first International Video Games, Personal and Home Computer Market
Palais Croisette Cannes (France), 3-7 October, 1983

Trade only

Veuillez m'adresser sans engagement votre documentation "Exposant". Please send me without any obligation, information for "Exhibitors".

Nom/Name: _____ Fonction/Position: _____

Société/Company: _____

Activités de la Société/Main activity of this Company: _____

Adresse/Address: _____

Tél: _____

Adresser ce coupon à / Please return this coupon to:

Commissariat Général: 179, Avenue Victor-Hugo 75116 Paris (France) - Tél.: (33) (1) 50514.03 - Télex 630.547 MIDORG
U.S. representative Harvey Seslowsky - Perard Associates (Syosset Office) 100 Lafayette Drive, Syosset, N.Y. 11791 - Tél.: (516) 364.3636 - Télex 6852011
U.K. representative Jack Kessler - International Exhibition Organisation Ltd 9 Stafford Street, London W1X 3PE - Tél.: (01) 499.2311 - Télex 25230

SUPA*EDIT

SUPA*EDIT is a powerful enhancement to level II basic's EDIT and LIST commands designed to suit the needs of the serious programmer/hobbyist. SUPA*EDIT will improve programming speed and is suitable for TRS80, Video Genie, Model I and Model III, 16K, 32K, 48K tape based systems. A lower case driver is also included for Model I systems.

Features evoked by SINGLE key stroke are:

1. Ability to list first or last line.
2. Step through program listing line by line, backwards and forwards.
3. Listing of the line currently being worked on.
4. Entry into the edit mode for the current line.
5. Recovery of lost program after NEW.



This machine language program occupies LESS than 0.5K of user memory — this is especially important to users of 16K systems and is simple to operate.

The Company manufacturing and supplying SUPA*EDIT has 10 years experience in worldwide mail order service. The introductory price is **UK£6.75** plus **UK£2.00** AIRMAIL postage, payment by Banker's Cheque/Draft. Contact:

ELITE ELECTRONIC INDUSTRIES PTY. LTD.,
36 Luxmoore Street, Cheltenham, Victoria 3192, Australia.
Tel: + 61-3-5831201

GEM SOFTWARE

for LYNX, DRAGON,
SPECTRUM & ZX81 Software

MONSTER MINE by W. E. MacGowan Escape from the mine with as much money as you can, but don't get closed in or caught by the prowling monsters. An addictive machine code game, with superb graphics and save facility.

Price (Lynx & Dragon)..... **£7.95** (Spectrum & ZX81)..... **£4.95**

SULTAN'S MAZE by Christopher Hunt Enter the 3D Maze in search of the Sultan's jewels, but beware, your strength may run out, or you may come face to face with the Mad Guardian. A multi-difficulty game with fantastic graphics and sound.

Price (Lynx & Dragon)..... **£7.95**

SPACE MISSION by W. E. MacGowan Launch from lunar base, fight your way through the asteroid belt to do battle with the enemy fleet. Multi-level space combat game, sets new standards in graphic excellence and attention to detail.

Price (Dragon)..... **£7.95** (Spectrum & ZX81)..... **£4.95**

CHARACTER GENERATOR by John Line A program for the programmer, allowing creation and saving of character sets/shape tables and subsequent inclusion into users basic program. Demonstration program and full ACSII character set included.

Price (Dragon)..... **£9.95**

GEMPACK IV by W. E. MacGowan Two great machine code games, with full colour graphics.

In **Sea Harrier** you must land your plane on the aircraft carrier, after dispersing the clouds with chemical bombs, but don't hit the ship!

In **Sub Chase** you must depth charge the wolf pack without being sunk. Both with 4 levels of play from easy to kamikaze!

Price (Lynx & Dragon)..... **£7.95**

CHATEAU by Pete Allen A new type adventure, in which you must wander the Count's old mansion in search of treasure! Of course, when the Count died and hid his treasure, he also left lots of unpleasant surprises for those brave enough to try and seek out his riches! Come face to face with Ghouls and Ghosts, Vampires and Troils; do you run or fight? Will the mysterious Travel Agent suddenly appear and whisk you away to far off places? Where can you find the key or the lamp? Is the clock booby-trapped? Will you die a cold and lonely death, or will you win through to claim the fantastic treasure of The Chateau??

Price (Dragon)..... **£7.95**

GAMES PACK III by Christopher Hunt

Reversi Pit your wits against the Lynx with this easy to learn, yet extremely demanding board game. Five skill levels, from novice to grand master.

Pontoon An excellent implementation of a favourite card game in full colour with sound. Lynx is a mean Banker.

Snake Guide the snake to the food, but watch out, he will grow and must not eat the wall or himself.

Price (Lynx)..... **£7.95**

All titles available mail order or Access
 All cassettes despatched by return of post

GEM SOFTWARE
 UNIT D, THE MALTINGS
 SAWBRIDGEWORTH, HERTS
 Telephone: (0279) 723567

Trade Enquiries Welcome — Please Ring for Dealer Pack

THE TEXAS PROGRAM BOOK

Vince Apps

35 programs for games, home and business use with the
TI 99/4A £5.95

Written for the home user these games are both fun and educational.

Now you can enter a **3D maze**, run a horse race, and even help a Penguin to save it's eggs. You can test your skills with anagrams, do metric conversions and run your own filing system and home accounts.

Available through bookshops everywhere or cheque or p.o.

Orders to

PHOENIX PUBLISHING ASSOC
14 VERNON ROAD BUSHEY
HERTS WD2 2JL

Price £5.95 plus 50p post.

NAME.....
 ADDRESS.....

post code.....

SOFTWARE & MICROS NOW IN STOCK AT

CLWYD PERSONAL COMPUTERS

Unit 19, Daniel Owen Pricinct, Mold, CH7 1AP.
Telephone: Mold 56842

SPECTRUM 16K & 48K



**Commodore 64
ATARI VIC 20 & ORIC 1
400 & 800**

sinclair ZX81

Software by:

Quicksilver

BUG-BYTE

IMAGINE

Over 200 Software in Stock



ORIC AND SINCLAIR COMPUTERS

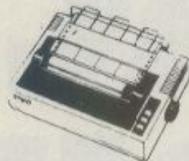
Oric 1 48K computer £147 (£158); Oric 1 16K n/a (n/a); Sinclair Spectrum 48K £113 (£133); Spectrum 16K £86.91 (£107); 32K memory upgrade kit for 16K Spectrum (Issue 2 only) £26.09 (£28); Fuller master unit for the Spectrum including speech synthesizer, sound synthesizer, amplifier and joystick ports £47.78 (£56); ZX microdrive n/a (n/a); ZX rs232 n/a (n/a); Keyboards with space bars for the ZX81 and the Spectrum £36 (£41); ZX printer £34.74 (£50); 5 printer rolls £10.43 (£16); ZX81 £43.43 (£52); ZX81 16K ram-packs £26.04 (£28). New luxury spectrum computers 48K with full sized typewriter keyboards complete with normal space bar enclosed in a larger plastic case which also houses the power supply and the computer pcb £138.20 (£174).

COMMODORE COMPUTERS

Commodore 64 £299 (£309). Special offer package - Vic 20 + cassette recorder + basic course + 4 games £121 (£149). Converter to allow the use of most ordinary mono cassette recorders with the Vic 20 and the Commodore 64 built £8 (£9); kit £6 (£7). Commodore cassette recorder £36.50 (£44). We stock most accessories.

OTHER COMPUTERS

Colour Genie £168 (£178); BBC Model B £424 (£440); Texas TI99-4A £139 (£169); Atari 800 £347 (£380); A'ari 400 16K with basic £173 (£215).



PRINTERS

The Epson MX80FT/3 has been replaced by the almost identical CT1 CP80 £262 (£282) and the very similar Star DP510 £262 (£282); Epson FX80 £378 (£408); Epson MX100/3 £425 (£465); New Star DP515 15" carriage printer £374 (£414); Seikosa GP100A £159 (£219); Oki Microline 80 £207 (£227); Oki Microline 82A £360 (£400); Oki Microline 84 £730; Oki Microline 92 £470. The Silver Reed, the latest miracle, a combined daisy wheel printer and electric typewriter for only £385 (£425); Juki 6'00 proportional daisy wheel printer £373 (£413); MCP 40 colour printer £139 (£159); Star STX 80 thermal printer £139 (£159). We can supply interfaces to run all the above from Sharp computers.

SWANLEY ELECTRONICS

Dept. PCT, 32 Goldsel Road, Swanley, Kent BR8 8EZ, England.

UK prices are shown first. UK customers must add postage (£1 on Sinclair products, £3.50 on other computers and disc drives and £4.50 on other printers) and the 15% VAT. The bracketed prices are European export prices and include insured airmail postage to all the countries of Europe including Norway, Sweden, Finland, Denmark, Spain and Italy. No VAT should be added to export prices. We are THE leading computer export specialists. Official UK credit orders welcome from government laboratories and educational establishments.

**DON'T MISS THIS
INCREDIBLE OFFER!
50 GAMES
£9.95**

YES, 50 GAMES! on cassette for all the following:

GALACTIC ATTACK
SPACE MISSION
LUNAR LANDER
PLASMA-BOLT
STARTREK
RADAR LANDING
ATTACKER
GALACTIC DOGFIGHT
ZION ATTACK
WAVEIVE ACTION
OKO
BOOGLES
PONTON
SKI JUMP
HANDMAN
OLD SONES
THRICE

MAZE EATER
ORBITTER
MOTORWAY
FORCE FIELD
NIM
TUNNEL ESCAPE
BARREL JUMP
CANNONBALL BATTLE
OVERTAKE
SITTING TARGET
SMASH THE WINDOWS
SPACE SHIP
JET FLIGHT
PHASER
INTRUDER
INFERNO
GHOSTS

SUBMARINES
ROCKET LAUNCH
PLANETS
BLACK HOLE
DYNAMITE
DO YOUR SUMS
DERBY DASH
SPACE SEARCH
UNIVERSE
BATS
TANKER
PARACHUTE
JETMOBILE
HIGH RISE
THE FORCE
EXCHANGE

**sinclair
SPECTRUM**

apple (ON DISC & CASSETTE)

**BBC
DRAGON**

ATARI VIC 20

ORIC-1

ZX81 LYNX

POSTAGE FREE TO U.K.
ORDER DIRECT TO:

U.T.S., P.O. Box 96
53 Lincoln Grove,
Harrogate,
North Yorkshire,
HG3 2UZ

PLEASE SEND ME _____
CHEQUE ENCLOSED, VALUE _____
NAME _____
ADDRESS _____
POSTCODE _____ G/423

**cut &
post
now**

GAMER

ATARI 400 & 800

400 (16K/inc. Basic) **£149** 800 (48K + Basic) **£285**
400 (16K) + Basic + Recorder + Joystick + 5 Blank
Cassettes + Demo Cassette **£199**
400 (48K) + All Above Items **£284**
800 (48K) + All Above Items **£339**
800 (48K) - Basic + Disc Drive + Joystick + 3 Blank Disks +
Demo Disk **£574**

DRAGON 32

Dragon 32 now only £175
Spectrum from **£99**
Oric 1 (48K) **£169**
Ace **£89.95**
ZX81 **£49.95**
Epson HX-20 **£462.00**
Vic 20 Pack **£139**
CBM64 **£329**
Sharp MZ80A **£499**
Sharp MZ80B **£899**

EPSON QX-10 NOW IN STOCK

Coming soon — Sord M5 — £189

ALL PRICES INCLUDE VAT

**24 GLOUCESTER ROAD
BRIGHTON BN1 6RJ**

CHARACTER BUILDING

Steve Dawson's comprehensive program to utilise the BBC Microcomputer's character definition facility to the fullest will vastly improve your programs



The design of custom characters for use in programs can be quite a laborious task using pen and paper. Not any more though because this program makes the task much easier. It will display the VDU statement required to produce the character which has been created. One further feature is that the characters defined by VDU 23 statements in published listings may be input directly and displayed on

the screen to be altered or saved as required. The characters defined may be saved as a database on tape in order that they may be used for future programs.

Getting Started

The program will run on a Model A or B machine with 32K RAM, MODE 1 being used for the screen display.

When the program is run, an 8x8 grid is presented on the screen and the ASCII codes 224-255 (user definable with O.S. 0.1) are printed out together with any characters which have already been defined. The program is menu driven with the following choices: -

- 1... Define character
- 2... Print VDU 23 string
- 3... Input VDU 23 string
- 4... End program

HINTS ON CONVERSION

The program contains several commands which are unique to BBC BASIC.

Procedures

These can usually be replaced by GOSUB except that the variables in brackets after the procedure definition statement are local variables and are not recognised outside the procedure.

Modes

MODE 1 and MODE 7 are used. MODE 7 is the teletext mode, text only with screen size of 40 x 25. In this mode, the colour and appearance of the text are changed with the following VDU codes.

- VDU130
- VDU131
- VDU133
- VDU136
- VDU141

Gives green text
 Gives yellow text
 Gives magenta text
 Gives flashing text
 Gives double height letters
 MODE 1 is a high resolution mode with graphics screen size of 320 x 256. It supports text having a screen size of 40 x 32. 4 colours are permissible in this mode. The colours used in this program are the logical colours 0 to 3 i.e. black, red, yellow

VDU5 and VDU4

- VDU7
- VDU11

- VDU12
- VDU23

and white respectively. The COLOUR command changes the text colour and is followed by the logical colour to be used. The GCOL 0,C statement changes the graphics colour to logical colour C. Other commands which may cause problems are:-
 These join and separate the graphics and text cursors. Thus, after the VDU5 statement, text may be printed at the graphics cursor within the graphics window, the position being determined by the MOVE command, with the top left hand corner of the text character being at any point on a 1280 x 1024 grid.
 Causes a short beep from the loudspeaker
 Moves the cursor to the start of the current line
 Clears the screen
 This is used to define the ASCII character (224-255) whose code is the number following the 23. The character is an 8x8 grid whose Nth row is a representation in binary of the Nth number following the

Full instructions are included within the program and the character design itself is very easy to accomplish. Crosshairs are moved around the 8x8 grid using the cursor keys. The square under the crosshairs may be filled or cleared by pressing F or C respectively. In a small box under the main grid the character is displayed 'actual.size' as it is produced. Once the character has been completed,

pressing E (End) will commit the character to memory and proceed with the program.

When the end program is selected from the menu, the newly defined characters are saved on tape for future use.

Saving The Data

Before the program can be run, a database must be created. To

do this SAVE the program as normal and then the following should be entered in command mode i.e. without line numbers: -
FOR I = 0 TO

256:?(&C00 + I) = 0:NEXT

This empty database should now be recorded straight after the main program using the command: -

*SAVE"DATA - 1" C00 D00

To run the program enter: -

CHAIN""

HOW IT RUNS

10-30	Print introduction	600-640	Displays the character on the 8x8 grid
40	Load database	650-670	Plots or unplots the individual squares within the 8x8 grid
50-70	Set up screen display, present menu	680-700	Prints the character in the small box under the 8x8 grid
80	Change order of program execution depending upon option selected	710-760	Accepts the input of a VDU 23 string from the keyboard, displays the character on the grid and actual size
90-110	Executed for option 3; input the character string	710-810	Called whenever a yes or no answer is required
120-250	Executed for option 1 and option 3 if the character is to be altered	820-840	Plots the crosshairs
130	Set cursor keys to produce ASCII codes	850-900	Fills or clears an individual square of the grid, alters the code in memory and replots the crosshairs
150	Plot crosshairs and character	910-940	POKES the new data into the relevant area of memory
160	Clear all internal buffers	950-1010	Alters the X and Y coordinates for the crosshairs if the cursor keys have been used
170-230	Check for key pressed. Call appropriate procedures to fill or clear squares or to move crosshairs	1020-1050	Outputs the VDU 23 string of a character
240	Put character code into memory	1060-1100	Delays program operation until the space bar is pressed (MODE 1)
250	Executed for option 2 and option 1 if the VDU string is required	1110-1150	Finishing procedure. Saves the new database
260-290	Executed for option 4 to end the program	1160-1420	Prints instructions
300-350	Plots 8x8 grid and small box under the grid to hold the character being worked on	1430-1460	Delays program operation until the space bar is pressed (MODE 7)
360-410	Sets up the codes 224 to 255 together with any characters which may have already been defined	1470-1530	Program introduction
420-450	Displays the menu	1540-1600	Loads data base
460-490	Checks the validity of input data		
500-520	Causes a delay		
530-560	Inputs the ASCII code of the character to be worked on		
570-590	PEEKs the data from memory for the character selected		

VDU24	code.	?(expression) = X	POKES the value of variable X into the memory location given by the expression
VDU28	Defines graphics window	X = ?(expression)	PEEKs the memory location given by the expression and returns its contents to the variable X
VDU31,X,Y	Defines a text window	&C00-&D00	The & symbol indicates that the number which follows is in hexadecimal. The area of memory &C00 to &D00 is reserved for user defined character definitions
PLOT6,X,Y	This is identical to the usual TAB(X,Y) command	*FX4,1	This enables the cursor keys to produce ASCII codes (136-139)
PLOT85,X,Y	Draws to the point X,Y from the last point visited in the logical inverse colour. i.e. draws black on white or white on black	*FX4,0	Returns the cursor keys to their normal editing duties
PLOT87,X,Y	Draws and fills a triangle (in the current graphics foreground colour) made up of point X,Y and the last two points visited	*FX15,0	Flushes all internal buffers
CLS	As for PLOT85 but the colour used is the current graphics background colour i.e. it effectively 'unplots' a triangle	*SAVE" name"	Saves the area of memory between &C00 and D00 on cassette. The file is then called 'name'
CHR\$(127)	Clears the text window	C00 D00	Loads the file called 'name' back into memory beginning at location &C00
CHR\$(11)	Moves the text cursor back one character and deletes the character at that position	LOAD" name" C00	Loads and runs the program called 'name'
SPC(X)	Same as VDU11	CHAIN" name"	These return the values TRUE or FALSE.
TIME = 0	Puts X spaces into the PRINT statement	Logical operators	These have the numeric values -1 and 0 respectively.
DIV	Sets the internal timer to zero. This increments in 1/100ths of a second		
MOD	Integer division		
	Returns the remainder after integer division		

CHARACTER BUILDING

Variables Used

ANS\$	Holds Yes or No in answer to a question
bit	Holds one of the eight bytes which make up the character definition
C	C can take the value 0 or 1. C = 0 indicates that the input is within the required range and thus valid. C = 1 rejects the input
check	Made equal to the variable to be validated by PROC-check
chr	ASCII code of the character being generated
GRID(8,8)	This array refers to the 8x8 grid. It holds 1 for a filled square or 0 for a cleared square
M	Returns the total of the binary equivalent of one line of the character
MEM(8)	This array holds the 8 bytes of the character code
move	Variable to show which key has been pressed. C(clear;67), F(fill;70) or E(end;69). Will also accept c(99), f(102) or e(101). Cursor keys (136-139)
opt	Takes the value 1-4 depending on the menu option selected
X	X coordinate of crosshairs
Y	Y coordinate of crosshairs

Local variables

CHAR	Points to the correct area of memory to place the data for a character whose VDU23 string is input from the keyboard
CHR	Points to the correct area of memory to find



factor	Holds 85 to fill a square or 87 to clear it
high	Highest number in the valid input range
low	Lowest number in the valid input range
period	Set in 100ths of a second for the internal timer
x,y	Coordinates of the square to be filled or cleared
z	Holds 1 to fill a square or 0 to clear it

PROGRAM LISTING

```

10REM VDU23 DESIGN by S.M.Dawson.
20ON ERROR GOTO280
30MODE7:PROC_intro
40PROC_load
50MODE1:DIM GRID(8,8),MEM(8)
60PROC_grid
70PROC_codes:PROC_menu:IF opt=4 THEN GOTOB0 ELSE P
ROC_character:PROC_string(chr):PROC_display:PROC_look

80ON opt GOTO 120,250,90,260
90PROC_instring(chr):COLOUR2
100PRINTTAB(0,27);"Do you wish to alter the charact
er (Y/N)":PROC_answer
110IF ANS$="No" THEN GOTO 70
120X=108:Y=888
130*FX4,1
140REPEAT
150PROC_xhair:PROC_look
160*FX15,0
170VDU7:PRINT"COMMAND ":REPEAT move=INKEY(0):UNTIL
move>0:VDU11
180IF NOT((move<71 AND move>68) OR (move<103 AND mo
ve>100) OR (move<140 AND move>135) OR move=67 OR move
=99) THEN 160
190IF move=70 OR move=102 THEN PROC_fill(85):ELSE I
F move<100 AND move<69 THEN PROC_fill(87)
200PROC_move
210UNTIL move=69 OR move=101
220PRINTTAB(0,27);"Do you want the VDU23 string (Y/
N)":PROC_answer
230IF ANS$="No" THEN GOTO70
240PROC_string(chr)
250PROC_outstring:GOTO70
260PROC_finish:MODE7
270PRINT"PROGRAM TERMINATED.":VDU7,7,7,7
280*FX4,0
290END
300DEFPROC_grid
310VDU24,0,288;1279;1023;28,0,31,39,23:GCOL0,1
320MOVE60,420:DRAW60,940:DRAW80,920:PLOT85,60,420:P

```

```

LOT85,80,440:PLOT85,580,420:PLOT85,560,440:PLOT85,580
,940:PLOT85,560,920:PLOT85,60,940:PLOT85,80,920
330GCOL0,2:FORI=1TO7:MOVE80+I*60,916:DRAW80+I*60,44
4:MOVE84,440+I*60:DRAW556,440+I*60:NEXT
340GCOL0,1:MOVE80,400:DRAW144,400:DRAW144,336:DRAW8
0,336:DRAW60,400
350ENDPROC
360DEFPROC_codes
370GCOL0,3:VDU5
380FORI=1TO16:MOVE544,960-I*32:PRINT(I+223);" ";CH
R$I27;CHR$(I+223);" ";(I+239);" ";CHR$I27;CHR$(I+
239):NEXT
390MOVE200,384:PRINT"CHR$="
400MOVE928,384:PRINT"C=Clear":MOVE928,352:PRINT"F=F
ill":MOVE928,320:PRINT"E=End":VDU4
410ENDPROC
420DEFPROC_menu
430COLOUR2:PRINT"SELECT OPTION""1....Define chara
cter""2....Print VDU23 string""3....Input VDU23 str
ing""4....End program":VDU7
440REPEAT:INPUT"OPTION (1-4)",opt:check=opt:PROC_ch
eck(1,4):UNTIL C=0:CLS
450ENDPROC
460DEFPROC_check(low,high)
470C=0:IF check >=low AND check <=high THEN ENDPROC
480PRINTCHR$11;SPC(20):COLOUR1:PRINTCHR$11;"ILLEGAL
ENTRY":VDU7,7:PROC_delay(150):COLOUR3:PRINTCHR$11;SP
C(20):C=1:PRINTCHR$11;CHR$11
490ENDPROC
500DEFPROC_delay(period)
510TIME=0:REPEAT UNTIL TIME >period
520ENDPRCC
530DEFPRCC_character
540COLOUR3:REPEAT:PRINTTAB(0,30);"CHR$ (224-255)= "
;:VDU7
550INPUT chr:check=chr:PROC_check(224,255):UNTIL C=
0:CLS
560ENDPROC
570DEFPROC_string(CHR)
580CHR=(CHR-224)*6+&C00:FORI=0TO7:MEM(I+1)=?(CHR+I)

```

PROGRAM LISTING

```

: NEXT
590 ENDPROC
600 DEFPROC display
610 FOR I=8 TO 1 STEP -1: bit=MEM(9-I): FOR J=8 TO 1 STEP -1: G
RID(J,I)=bit MOD 2
620 IF GRID(J,I)=1 THEN PROC_plot(J,I,1): ELSE PROC_p
lot(J,I,0)
630 bit=bit DIV 2: NEXT: NEXT
640 ENDPROC
650 DEFPROC_plot(x,y,z)
660 GCOLOR,3: MOVE x*60+24,y*60+384: MOVE x*60+76,y*60+38
4: PLOT 85-2*(z=0),x*60+24,y*60+436: PLOT 85-2*(z=0),x*60
+76,y*60+436
670 ENDPROC
680 DEFPROC_look
690 GCOLOR,2: VDU5: MOVE 96,384: PRINT " "; CHR$127: MOVE 96,
384: PRINT CHR$(chr): MOVE 400,384: PRINT " "; CHR$127: CHR
$127: CHR$127: chr: VDU4
700 ENDPROC
710 DEFPROC_instring(CHAR)
720 COLOUR2: PRINT TAB(0,27); "Input the 8 VDU bytes on
e at a time"
730 FOR I=1 TO 8: VDU7: PRINT "Byte "; I: REPEAT INPUT MEM(
I): check=MEM(I): PROC_check(0,255): UNTIL C=0: VDU11: PRI
NT SPC(12): VDU11: NEXT: CLS
740 CHAR=(CHAR-224)*8+&C00: FOR I=0 TO 7: ?(CHAR+I)=MEM(I
): NEXT
750 PROC_display: PROC_look
760 ENDPROC
770 DEFPROC_answer
780 VDU7: REPEAT ANS$=GET$: UNTIL ANS$="Y" OR ANS$="y"
OR ANS$="N" OR ANS$="n"
790 IF ANS$="Y" OR ANS$="y" THEN ANS$="Yes" ELSE ANS
$="No"
800 PRINT ANS$: PROC_delay(150): CLS
810 ENDPROC
820 DEFPROC_xhair
830 MOVE X-12,Y: PLOT 6,X+12,Y: MOVE X,Y-12: PLOT 6,X,Y+12
840 ENDPROC
850 DEFPROC_fill(factor)
860 GCOLOR,3
870 MOVE X-24,Y-24: MOVE X+28,Y-24: PLOT factor,X-24,Y+28
: PLOT factor,X+28,Y+28
880 GRID(INT((X-108)/60)+1,INT((Y-468)/60)+1)--1
*(factor=85)
890 PROC_memplace: PROC_xhair
900 ENDPROC
910 DEFPROC_memplace
920 M=0: I=INT((Y-468)/60)+1: FOR J=8 TO 1 STEP -1: M=GRI
D(J,I)*(2^(8-J))+M: NEXT: I=8-1
930 ?(chr-224)*8+&C00+I)=M: PROC_look
940 ENDPROC
950 DEFPROC_move
960 PROC_xhair
970 X=X+60*(move=136)-60*(move=137)
980 IF X<110 THEN X=110 ELSE IF X>530 THEN X=530
990 Y=Y+60*(move=138)-60*(move=139)
1000 IF Y<470 THEN Y=470 ELSE IF Y>890 THEN Y=890
1010 ENDPROC
1020 DEFPROC_outstring
1030 COLOUR2: PRINT TAB(0,27); "The VDU string is :_" : C
OLOUR1: PRINT "VDU23,"; chr;
1040 FOR I=1 TO 8: PRINT " "; MEM(I); : NEXT: PRINT "": PROC_con
tinue
1050 ENDPROC
1060 DEFPROC_continue
1070 COLOUR2: VDU7
1080 PRINT TAB(0,30); "<PRESS SPACE BAR TO CONTINUE>"
1090 REPEAT UNTIL GET=32: CLS
1100 ENDPROC
1110 DEFPROC_finish
1120 COLOUR1: PRINT TAB(0,25); "Insert blank cassette in
to recorder in" "order to save new database.": COLOUR2
: VDU7,7
1130 *SAVE"DATA 1" C00 D00
1140 COLOUR1: PRINT TAB(0,30); "Database recorded.": VDU7
,7: PROC_delay(200): VDU12
1150 ENDPROC
1160 DEFPROC_instruct
1170 VDU131: PRINT "This program will allow you to defi
ne"
1180 VDU131: PRINT "the characters 224 to 255 and save
the"

```

```

1190 VDU131: PRINT "results on tape."
1200 VDU131: PRINT "When the program is loaded initiall
y"
1210 VDU131: PRINT "all the characters will be blank th
us"
1220 VDU131: PRINT "allowing you to build up a data bas
e"
1230 VDU131: PRINT "_ or data bases _ of useful defined
"
1240 VDU131: PRINT "characters."
1250 VDU131: PRINT "Alternatively, a VDU23 string may b
e"
1260 VDU131: PRINT "input directly and the resulting"
1270 VDU131: PRINT "character will be displayed on the"
1280 VDU131: PRINT "screen. This may then be altered o
r"
1290 VDU131: PRINT "saved as you wish."
1300 VDU131: PRINT "For all options, whenever an input"
1310 VDU131: PRINT "is required, a short beep will be"
1320 VDU131: PRINT "heard from the loudspeaker."
1330 PROC_cont
1340 VDU31,2,2,131: PRINT "In order to alter or define
the"
1350 VDU131: PRINT "character presented on the grid, us
e"
1360 VDU131: PRINT "the cursor keys to move the crossha
irs"
1370 VDU131: PRINT "to the correct position and then us
e"
1380 VDU131: PRINT "C....to clear the square"
1390 VDU131: PRINT "F....to fill the square or"
1400 VDU131: PRINT "E....to end"
1410 PROC_cont
1420 ENDPROC
1430 DEFPROC_cont
1440 VDU31,2,23,7,130: PRINT "<Press space bar to conti
nue>"
1450 REPEAT UNTIL GET=32: CLS
1460 ENDPROC
1470 DEFPROC_intro
1480 VDU31,5,10,141,130: PRINT "USER DEFINED GRAPHICS"
1490 VDU31,5,11,141,130: PRINT "USER DEFINED GRAPHICS"
1500 VDU31,2,15,136,133: PRINT "<Turn cassette recorder
off>": VDU7,7
1510 PROC_cont
1520 PRINT "Do you want instructions (Y/N) ?": PROC_ans
wer: IF ANS$="Yes": PROC_instruct
1530 ENDPROC
1540 DEFPROC_load
1550 VDU31,0,14,133: PRINT "Turn cassette recorder on t
o load"
1560 VDU133: PRINT "database.": VDU7,7: PROC_cont
1570 *LOAD"DATA 1" C00
1580 VDU31,7,12,130: PRINT "Database is now loaded."
1590 VDU31,3,17,133: PRINT "<Turn cassette recorder off
>": VDU7,7,7: PROC_cont
1600 ENDPROC
>

```



AGF

PROGRAMMABLE JOYSTICK INTERFACE

ONLY
32.95
+£1.00pp

for

Sinclair ZX Spectrum 81

ABOUT OUR PROGRAMMABLE INTERFACE

Surpassing the outstanding specification of our Interface Module II which still offers the best software support at its price, a Joystick Interface that is compatible with ALL SOFTWARE through its unique hardware programmable design.

The Interface plugs on to the rear connector of your ZX81 or ZX Spectrum.

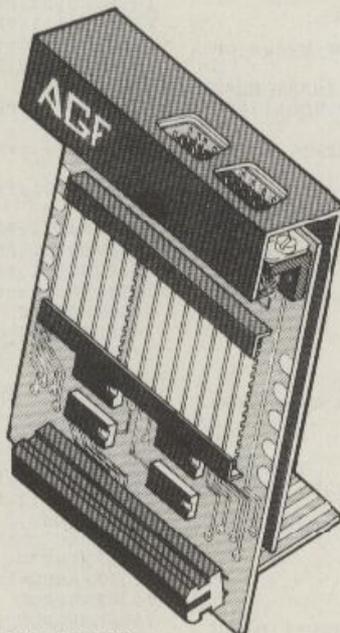
Quick clip-on connections, which are configured from a reference card supplied, allow you to define which of the forty keys are simulated by which action of the Joystick. A pack of ten Quick Reference Programming Cards makes setting for your favourite games even easier. These can be filled in to show at a glance the configuration required and stored in the cassette case of the particular game. When you change to a game using different keys the module is re-programmed in a few seconds.

As with our Interface Module II the Programmable Interface accepts all standard switch Joysticks that are Atari-compatible. Two sockets are available which are connected together for two player games which use the same keys for both players.

The Interface resides in the keyboard address space and does not affect its operation or interfere with any other add-ons. A rear extension edge connector will accommodate expansion of your system.

The unique AGF key simulation principle makes it extremely easy to incorporate Joystick action in your own programs. All eight directions and fire are read by simple BASIC.

With every order comes a free demonstration program called 'Video Graffiti' plus a full set of instructions.



KEY FEATURES

- ★ Programmable design gives TOTAL software support.
- ★ Accepts Atari, Competition Pro, Wico, Starfighter, Quick Shot, Le Stick etc.
- ★ Rear extension connector for all other add-ons.
- ★ Free demo program and instructions.

PACKAGE CONTENTS SUPPLIED

- Programmable Interface Module as illustrated, complete with clip-on programming leads.
- Self adhesive programming chart detailing how to define which key is simulated by UP, DOWN, LEFT, RIGHT, and FIRE. This can be fixed on to the case of your computer or if preferred the protective backing can be left on. The chart is made of a very durable reverse printed plastic and is extremely easy to read.
- One pack of ten Quick Reference Programming Cards for at-a-glance setting to your games requirements. The card allows you to mark the configuration in an easy to read fashion with space to record the software title and company name.
- Video Graffiti demonstration program which is written totally in BASIC to illustrate how all eight directions and fire can be read. This is also a useful high resolution drawing program.
- 12 months guarantee and full written instructions.

JOYSTICKS

ATARI

CONTROLLERS

FOR USE WITH OUR INTERFACE Module or VIC 20, Commodore 64, Atari VCS, Atari 400, Atari 800

If you require extra Joysticks for our original interface module mark order 'OLD' Joysticks

ONLY £7.54 inc VAT + P&P

FROM: MR/MRS/MISS			
ADDRESS			
SEND C.W.O. (NO STAMP NEEDED) TO: A.G.F. HARDWARE, DEPT. PCT			
FREEPOST, BOGNOR REGIS, WEST SUSSEX, PO22 9BR			
QTY	ITEM	ITEM PRICE	TOTAL
	PROGRAMMABLE INTERFACE	33.95	
	JOYSTICK(S)	7.54	
	PACK(S) QUICK REFERENCE CARDS	1.00	
ONE	VIDEO GRAFFITI	FREE	
ZX81 <input type="checkbox"/> ZX SPECTRUM <input type="checkbox"/>		Please tick	
DEALER ENQUIRIES WELCOME		EXPORT PRICES ON APPLICATION	
		FINAL TOTAL	

THE GAMES YOU'VE BEEN DYING TO SEE!

For the Unexpanded VIC-20

TVIC 3 Skramble!	£7.95
TVIC 4 Terminal Invaders	£5.95
TVIC 5 Meteor Blaster	£5.95

This Month Only, Reduced from £7.95

TVIC 6 Gridder	for just £4.95
TVIC 7 Line Up 4/Reversi	£7.95
TVIC 8 Get Lost! (3D Maze)	£5.95

Adventures for VIC-20 with 16K Expansion

TVIC 9 The Curse of the Werewolf	£9.95
TVIC 10 Rescue from Castle Dread	£9.95

Commodore 64 Software

TC641 Super Skramble	£9.95
----------------------	-------

For the Dragon 32

TDRAG 1 Line Up 4	£4.95
-------------------	-------

DEALER ENQUIRIES WELCOME

Machine-code programmers wanted! We will pay up to £1000 for good, original programs for any of the popular micros.

Demand our games at all good computer shops or buy mail order from:

TERMINAL SOFTWARE, DEPT. PCT
28 Church Lane, Prestwich, Manchester M25 5AJ

Bamby software

Leverburgh, Isle of Harris PA83 3TX

Tel: 085 982 313

Introduce original games for Dragon 32

Golden Apples: Steal the apples, then defeat the warlock	£5.95
Planetary Trader: Choose your cargo (that's the easy bit) then deliver it	£5.95
Surprise: Spells, giants, a magic ring, but not another 'Lord of the Rings'	£8.45
Mini-games: 4 games per tape, simple but compelling!	£5.95
Bopswizzle	£5.95
Alien Odyssey: Parts I & II	£9.95
Spectrum: Master code	£6.50
Mystery manor	£6.50
TI99/4A: Alone at Sea	£6.50
K64	£6.50
Underground adventure	£8.45

Write to us at the above address, or ring anytime between 9 a.m. and 9 p.m.

ALTERNATIVE PHONE NO.
085 982 239



Can you stop them?

Protect your dam from wave after wave of enemy bombers. Different skill levels, stunning graphics and sound. A colourful arcade style game for the Atari 400/800 with 32K and the Oric 48K. (Please state which.)

£14.50 (inc. VAT + P&P7)

AVAILABLE ONLY FROM:

D. FROST SUPPLIES LTD

34 Field Road, Reading.

Tel: (0734) 581682

CHEQUES & PO's ONLY DEALER ENQUIRIES WELCOME

MAIL ORDER PROTECTION SCHEME

If you order goods from Mail Order Advertisers in this magazine and pay by post in advance of delivery, this publication will consider you for compensation if the advertiser should become insolvent or bankrupt, provided:

1. You have not received the goods or had your money returned; and
2. You write to the publisher of this publication explaining the position not earlier than 28 days from the day you sent your order and not later than 2 months from that day.

Please do not wait until the last moment to inform us. When you write, we will tell you how to make your claim and what evidence of payment is required.

We guarantee to meet claims from readers made in accordance with the above procedure as soon as possible after the advertiser has been declared bankrupt or insolvent to a limit of £1,800 per annum for any one advertiser, so affected, and up to £5,400 p.a. in respect of all insolvent advertisers. Claims may be paid for higher amounts, or when the above procedures have not been complied with, at the discretion of this publication, but we do not guarantee to do so in view of the need to set some limit to this commitment and to learn quickly of reader's difficulties.

This guarantee covers only advance payment sent in direct response to an advertisement in this magazine (not, for example, payments made in response to catalogues, etc. received as a result of answering such advertisements):

CLASSIFIED ADVERTISEMENTS ARE EXCLUDED.

Abbex

A + F

Quicksilva

Bug Byte

Artic

Sumlock

Hewson

Mikro-gen

Micro Power

Salamander

Melbourne House

Interceptor Micros

Elfin

Kansas

Algray

Quest

I J K Software

Romik

Rabbit

Imagine

J K Greye

Channel 8

Impact

Ultimate

Juniper

PCS

DISTRIBUTION

RETAILERS!

THE BIGGEST HOME COMPUTER
SOFTWARE WHOLESALER IN
GT. BRITAIN

WE OFFER *VERY*
GENEROUS
DISCOUNTS
ON SOFTWARE

GUARANTEED 24 HOUR DELIVERY

Save time and frustration. Get all your
software needs from one company. For
details ring now on

0254 691211 / 2 or write to:

**PCS DISTRIBUTION,
UNIT 6, SCOTSHAW BROOK IND EST,
BRANCH ROAD, LOWER DARWEN,
DARWEN, LANCS., BB3 0PR.
Tel: 0254 691211/2**

ORIC 1 COMPUTERS

Distributor for MR. MICRO LTD.
SOLE DISTRIBUTOR FOR MERCURY + SOUND SOFTWARE
Proprietors: Cardbrand Ltd.
Directors: Brian Greenwood and Dave Ridyard

J. K. Grey
Enterprises

Micro Deal

Oric Software

Oric Computers

Severn Software

Digital Fantasia

Solar

Simonsoft

P.S.S.

M. C. Lothlorien

Secta

New Generation
S/W

Vulcan Electronics

Superior Software

Cosma

Micro Byte

Elephant Software

D K Tronics

Workforce

Peaksoft

Arcadia

Rushton

Jilsoft

Titan

Software Invasion

Cosma

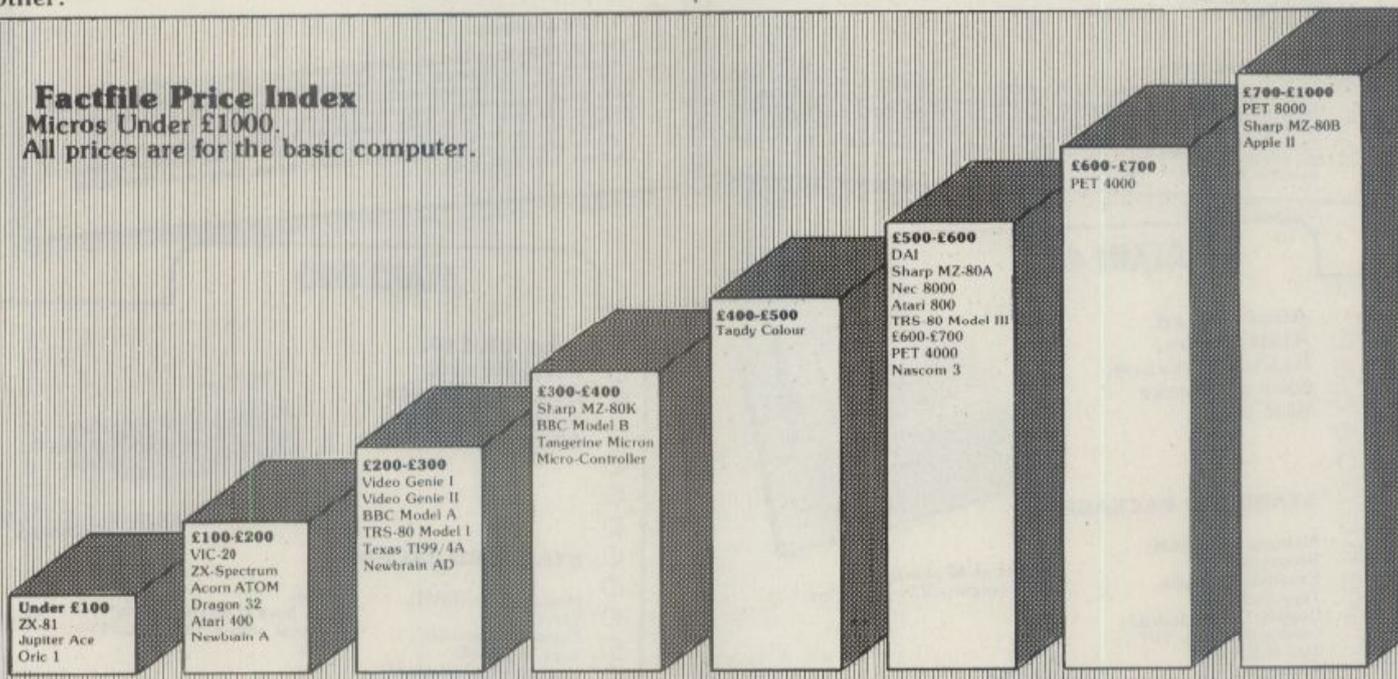
MICRO FACTFILE

Factfile is our regular buyer's guide to microcomputers. Herein you will find all the important facts and figures on 28 of the most important micros on the market under £1000. The idea is that you are able to directly compare what different manufacturers are offering you and how much they are charging you for it. Many brochures and adverts bury the reader in a mass of irrelevant facts and figures, which make it difficult to judge one against the other.

Factfile sorts it all out for you! Just look down the price-range index to discover which machines are in your price-range and then consult the 'cards' on each. All the information is in a standard form and has all been checked by our technical staff. The section is presented alphabetically.

As new machines become available, we will add them into the FACTFILE as soon as we can.

Factfile Price Index
Micros Under £1000.
All prices are for the basic computer.



Factfile

RAM: Stands for Random Access Memory and it is in there to accept the user's programs. Amount of memory is measured in "thousands of bytes" or "K" ie, 8K. A byte is a computer 'word' or single piece of information, made up of eight 'bits' which are just 1 or 0. Hence you need thousands of bytes to store a reasonable size program, since each letter, number, full stop, comma, line number, etc, uses up computer 'words' quite rapidly.

As a guideline - you can get about 50 program lines into 1K and 250 into 8K. This is a rough estimate - don't take it literally! The figures are not straight multiples, because you need to allow the machine space to work on your listing, once you've typed it in.

ROM: Read Only Memory. The machine can look and see what is stored in the memory, but it cannot alter the contents, nor store anything new. Generally used for control programs, where the micro consults the memory to see what to do next at various points in the program. Languages, such as BASIC, are stored in ROM and allow the machine to interpret what you type in, in terms of its own 'machine code'.

SIZE OF BASIC: The number of bytes occupied by the BASIC language is important, as it is an approximate guide to the BASICs versatility. The more powerful the language, the easier it should be to use.

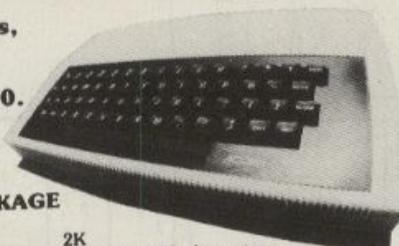
BUS CONNECTION: A socket on the micro which allows it to be linked up to various add-ons. This can take the form of many various items, ie, expansion box, printer, disc drives, plotting device. In short a BUS is an information 'window' through which the micro communicates with the outside world.

SERIAL/PARALLEL OUTPUT: This refers to the manner in which the micro transmits data to other units. If it puts out information in a long string, one bit after another, down a single wire or connector, it is a serial output. Parallel output is where pins or wires carry information simultaneously and are 'read' together as a block by whatever it is the micro is communicating with.

VIDEO OUTPUT: an output which will drive a monitor, as opposed to a TV set, allowing it's use as a screen for the computer.

ACORN ATOM

Acorn Computers,
4A Market Hill,
Cambridge.
Tel: 0223-245200.



STANDARD PACKAGE

Memory Size (RAM)	2K
Screen Size	16 lines of 32 characters
Expansion Sockets	BUS connector, Printer, Video output
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£140 kit, £174.50 built

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	12K internal, 32K external options	£45-149
Printer	Yes	—
Monitor	No	£299
Disc Drives	Yes	£11.50
Other Languages	Yes	—
Multi-user	Yes	—
Capabilities	Yes, BBC BASIC	£50
BASIC extensions (Toolkits)		

OTHER ADD-ONS:

Centronics-type connector, Technomatic Ltd, 17 Burnley Road, London NW10, E8.50; **TMS 5100 Talking Board**, GM Microtronics Ltd, Unit 14, Godinton Way Industrial Estate, Godinton Road, Ashford, Kent, £82.95; **DUO-1 64K add-on**, Industrial Estate, Godinton Road, Ashford, Kent, £82.95; **DUO-1 64K add-on**, Audio Computers, 87 Bournemouth Park Road, Southend-on-sea, SS5 2JJ, £64 kit, £70 built; **MZ163 RAM expansion boards**, Timedata Ltd, 57 Swallowdale, Basildon, Essex SS15 5BZ, £59.50-76.

APPLE II

Apple Computer (UK) Ltd,
Finway Road,
Hemel Hempstead,
Herts, HP2 7PS



STANDARD PACKAGE

Memory Size (RAM)	48K
Screen Size	24 lines of 40 characters
Expansion Sockets	BUS connections
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8 or 12K
Average Price	£812

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	Yes various	£200-1700
Monitor	Yes	£134
Disc Drives	Yes	£379
Other Languages	Yes	£84-500
Multi-user	Yes	—
Capabilities	No	—
BASIC extensions (Toolkits)	Yes	£26

OTHER ADD-ONS:

TMS 5100 Talking Board, GM Microtronics Ltd, Unit 14, Godinton Way Industrial Estate, Godinton Road, Ashford, Kent, £82.95; **Multifunction Card**, Datex Micros, 193 Touring Road, Worthing, W. Sussex, £85; **5 1/4" Winchester disc drive**, Independent Computer Engineering Ltd 16/18, Littleton Road, Ashford, Middlesex, TW15 1UQ; **16K RAM Board**, DDP Research & Marketing, 17 Novel Square, Basildon, Essex, SS13 1LP, £75; **U-port, 8 serial interfaces**, U-Microcomputers, Ltd, Winstanely Industrial estate, Long Lane, Warrington, Cheshire, WA2 8PR, £195.

ATARI 400

Atari UK Ltd,
Atari House,
Railway Terrace,
Slough, Berks
SL2 5BZ.



STANDARD PACKAGE

Memory Size (RAM)	16K
Screen Size	24 lines of 40 characters
Expansion Sockets	Serial output, BUS connector
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£149.99

MANUFACTURER'S EXPANSIONS

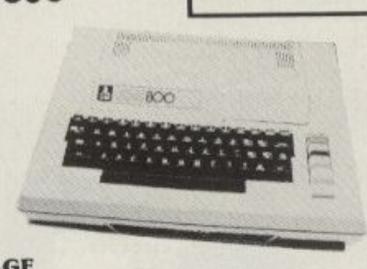
	DETAILS	PRICE
RAM	No	—
Printer	Yes	—
Monitor	No	£199.90
Disc Drives	Yes	£299.99
Other Languages	Yes	£39.79
Multi-user	Yes	—
Capabilities	No	—
BASIC extensions (Toolkits)	Yes	TBA

OTHER ADD-ONS:

TMS 5100 Talking Board, GM Microtronics Ltd, Unit 14, Godinton Way Industrial Estate, Godinton Road, Ashford, Kent, £82.95

ATARI 800

Atari UK Ltd,
Atari House,
Railway Terrace,
Slough, Berks
SL2 5BZ.



STANDARD PACKAGE

Memory Size (RAM)	48K
Screen Size	24 lines of 40 characters
Expansion Sockets	Serial output, BUS connector
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£399.95

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	Yes	£199.99
Printer	No	—
Monitor	Yes	£299.99
Disc Drives	Yes	£39.79
Other Languages	Yes	—
Multi-user	No	—
Capabilities	Yes	TBA
BASIC extensions (Toolkits)	Yes	—

OTHER ADD-ONS:

TMS 5100 Talking Board, GM Microtronics Ltd, Unit 14, Godinton Way Industrial Estate, Godinton Road, Ashford, Kent, £82.95; **Carrying case**, CJE Microcomputer, 25 Henry Avenue, Rustington W. Sussex, BN16 2PA, £18.50

BBC MICROCOMPUTER

**BBC Model A,
BBC Microcomputer
Systems,
PO Box 7,
London W3 6JX.**



STANDARD PACKAGE

Memory Size (RAM)	16
Screen Size	32 lines of 40 characters (max)
Expansion Sockets	Parallel serial output, analogue output, Bus connection
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	16K
Average Price	£299

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	up to 32K	£100
Printer	TBA	—
Monitor	Yes	£200
Disc Drives	TBA	—
Other Languages	TBA	—
Multi-user	—	—
Capabilities	Yes	—
BASIC extensions (Toolkits)	TBA	—

OTHER ADD-ONS:

Disc drives, single and dual. Cumara Ltd, 35 Walnut Street Close, Guildford, Surrey GU1 4UN, Tel: 0483 50321, £199-799; **BBC Cassette Recorder.** Surrey GU1 4UN, Tel: 0483 50321, £199-799; **BBC Cassette recorder.** Microage Electronics, 135 Hale Lane, Edgware, Middx, £28; **Colour Monitor.** Portatel Conversions Ltd, 25 Sunbury Cross Centre, Staines Roach West, Sunbury-on-Thames, Middx, TW16 7BB, £299; **Floppy Disc Controller Kit.** Sunbury-on-Thames, Middx, TW16 7BB, £299; **Floppy Disc Controller Kit.** Midwich Computer Co Ltd, Hewitt House, Northgate Street, Bury St. Edmunds, Suffolk IP33 1HQ, £42.50; **Analogue Joystick, Light Pen.** Sack Computers, 290-298 Derby Road, Bootle, Liverpool.

BBC MICROCOMPUTER

**BBC Model B
BBC Microcomputer
Systems,
PO Box 7,
London W3 6JX**



PACKAGE

Memory Size (RAM)	32
Screen Size	30 lines of 80 characters
Expansion Sockets	Serial and parallel output, analogue output, printer BUS connection
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	No
Size of BASIC	Yes
Average Price	£399

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	—	—
Monitor	TBA	TBA
Disc Drives	No	—
Other Languages	TBA	TBA
Multi-user	TBA	TBA
Capabilities	Yes	—
BASIC extensions (Toolkits)	TBA	TBA

OTHER ADD-ONS:

Disc drives, single and dual. Cumara Ltd, 35, Walnut Tree Close, Guildford, Surrey GU1 4UN, Tel: 0483 50321, £199-799; **BBC Cassette recorder.** Microage Electronics, 135 Hale Lane, Edgware, Middx, HA8 9QP, £28; **Colour Monitor.** Portatel Conversions Ltd, 25 Sunbury Cross Centre, Staines Road West, Sunbury-on-Thames, Middx, TW16 7BB, £299; **Floppy Disc Controller Kit.** Midwich Computer Co Ltd, Hewitt House, Northgate Street, Bury St. Edmunds, Suffolk, IP33 1HQ, £42.50; **Carrying Case.** CJE Microcomputers, 25 Henry Avenue, Rustington, W. Sussex, BN16 2PA, £18.50.

COMMODORE PET 4000

**Commodore,
675 Ajax Avenue,
Slough, Berks**



STANDARD PACKAGE

Memory Size (RAM)	16 or 32K
Screen Size	25 lines of 40 characters
Expansion Sockets	IEEE 488 standard, parallel output
Tape Included?	Yes
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	12K
Average Price	£632.50, £799.25

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	Yes several	£454-1604
Monitor	N/A	—
Disc Drives	Yes	£396
Other Languages	Yes, single or dual	£454-1029
Multi-user	—	—
Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Universal Interface. Technomatic Ltd, 17 Burnley Road, London NW10, £149; **TMS 5100 Talking Board.** GM Microtronics Ltd, Unit 14, Godinton Way Industrial Estate, Ashford, Kent, E82.95; **64K DRC Module.** Audio Computers, 87 Bournemouth Park Road, Southend-on-sea S55 2JJ, £70 kit, £80 built.

COMMODORE PET 8000

**Commodore,
675 Ajax Avenue,
Slough, Berks**



STANDARD PACKAGE

Memory Size (RAM)	32K or 96K
Screen Size	25 lines of 80 characters
Expansion Sockets	IEEE 488 standard, parallel output
Tape Included?	Yes
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	12K
Average Price	£980, £1374

MANUFACTURER'S EXPANSIONS

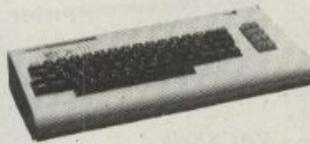
	DETAILS	PRICE
RAM	No	—
Printer	Yes various	£454-1604
Monitor	N/A	—
Disc Drives	Yes single or dual	£454-1029
Other Languages	Yes	—
Multi-user	—	—
Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Universal Interface. Technomatic Ltd, 17 Burnley Road, London NW10, £149; **TMS 5100 Talking Board.** GM Microtronics Ltd, Unit 14, Godinton Way Industrial Estate, Ashford, Kent, E82.95; **64K DRC Module.** Audio Computers, 87 Bournemouth Park Road, Southend-on-sea S55 2JJ, £70 kit, £80 built.

COMMODORE VIC20

Commodore,
675 Ajax Avenue,
Slough, Berks



STANDARD PACKAGE

Memory Size (RAM)	5K
Screen Size	23 lines of 22 characters
Expansion Sockets	BUS connection, Disc, Printer, Serial output, joystick
Tape Included?	Yes
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£129.99

MANUFACTURER'S EXPANSIONS

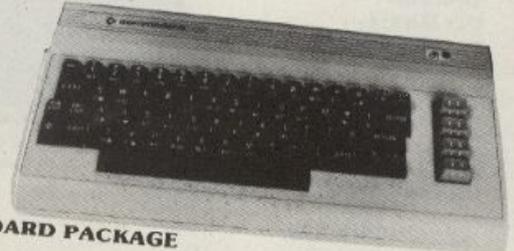
	DETAILS	PRICE
RAM	3K,8K,16K expansion options	£30,£45,£75
Printer	Yes	£270
Monitor	No	—
Disc Drives	Yes	£396
Other Languages	Yes	£38.95
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

VCR-20.
20K RAM cartridge. Audio Computers, 87 Bournemouth Park Road, Southend on Sea SS5 2JJ, £39 kit, £45 built; **Expansion Board.** 3K-16K, Arfon Microelectronics Ltd, Glyn Industrial Estate, Caernafon, Gwynedd, Wales LL55 2BD, £220. Languages VIC Forth, Adda Computers, 154 Victoria Road, Acton, London, W3.

COMMODORE 64

Commodore,
675 Ajax Avenue,
Slough, Berks



STANDARD PACKAGE

Memory Size (RAM)	64K
Screen Size	25 lines of 40 characters
Expansion Sockets	BUS, Serial, Video
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£350

MANUFACTURER'S EXPANSIONS

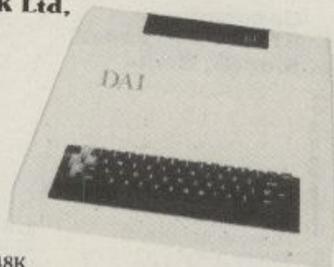
	DETAILS	PRICE
RAM	No	—
Printer	No	—
Monitor	Yes	£230-276
Disc Drives	No	—
Other Languages	Yes	£299
Multi-user Capabilities	Yes	—
BASIC Extensions	Yes	—

OTHER ADD-ONS:

Light Pen, 4 slot motherboard, Joystick, RS232 Interface. Stack Computers, 290-298 Derby Road, Bootley Liverpool. 051-933 5511.

DAI

Data Applications UK Ltd,
16B Dyer Street,
Cirencester,
Gloucestershire,
GL7 2PF



STANDARD PACKAGE

Memory Size (RAM)	48K
Screen Size	24 lines of 60 characters
Expansion Sockets	BUS connection, Serial output, joystick socket
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	16K
Average Price	£575

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	No	—
Monitor	No	—
Disc Drives	Yes	TBA
Other Languages	No	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	Yes, maths pack	£149

OTHER ADD-ONS:

None Reported

DRAGON 32

Dragon Data Ltd
Queensway,
Swansea
Industrial Estate,
Swansea, SA5 4EH



STANDARD PACKAGE

Memory Size (RAM)	32K
Screen Size	16 lines of 32 characters
Expansion Sockets	Yes
Display Unit Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	16K
Average Price	£199

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	—	—
Printer	No	—
Monitor	No	—
Disc Drives	No	—
Other Languages	Yes	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Joystick, Light Pen, 4 slot motherboard. Stack Computers 290-298 Derby Road, Bootle, Liverpool. 051-933 5511.

JUPITER ACE

Jupiter Cantab
 22 Foxhollow
 Bar Hill
 Cambridge
 CB3 8EP



STANDARD PACKAGE

Memory Size (RAM) 3K
 Screen Size 24 lines of 32 characters
 Expansion Sockets Not known
 Tape Included? No
 Display Unit Included? No
 Usable Domestic TV? Yes
 Size of BASIC Resident language is FORTH at 8K
Average Price £89.95

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	TBA	--
Printer	TBA	--
Monitor	TBA	--
Disc Drives	TBA	--
Other Languages	TBA	--
Multi-User Capabilities	TBA	--
BASIC extensions (toolkits)	N/A	--

OTHER ADD-ONS:

None Reported.

NASCOM 3

Lucas Logic, NASCOM
 Microcomputers Division,
 Welton Road,
 Wedgenock Industrial
 Estate,
 Warwick, CV34 5PZ.
 Tel: 0926-497733



STANDARD PACKAGE

Memory Size (RAM) 0-48K
 Screen Size 25 lines of 40 or 80 character
 Expansion Sockets Parallel & serial outputs, BUS connections
 Tape Included? No
 Display Unit Included? No
 Usable Domestic TV? Yes
 Size of BASIC 8-10K
Average Price £549

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	up to 48K (max)	£130
Printer	Yes	£215-1285
Monitor	Yes	£99-120
Disc Drives	Yes, single or dual	£470-685
Other Languages	Yes	£50
Multi-user	No	--
Capabilities	Yes	--
BASIC extensions (Toolkits)	Yes	-15-50

OTHER ADD-ONS:

Olivetti disc drives, single and dual, Kram Electronics, Victoria House, 17, Highcross St., Leicester, LE1 4PF, £179-349; **A/D Board,** 10, Research Ltd, 6, Laleham Avenue, Mill Hill, London NW7 3HL, £120 + VAT; **Hobbit - mini-cassette system,** Ikon Computer Products, Kilo Lane, Laugharne, Cwmnathen, Dyfed, £99 + VAT; **Disc drives, single and dual,** Micro-Spares, 19, Roseburn Terrace, Edinburgh, EH12 5N9, £199-279.

NEWBRAIN

Grundy Business
 Systems Ltd,
 Grundy House,
 Somerset Road,
 Teddington
 TW11 8TD.



STANDARD PACKAGE

Memory Size (RAM) 32K
 Screen Size 25 lines of 40 or 80 characters
 Expansion Sockets Printer, serial, video, data bus
 Tape Included? No
 Display Unit Included? No (Single line option on model AD)
 Usable Domestic TV? Yes
 Size of BASIC 18K
Average Price £199 model A, £299 Model AD

MANUFACTURER'S EXPANSIONS

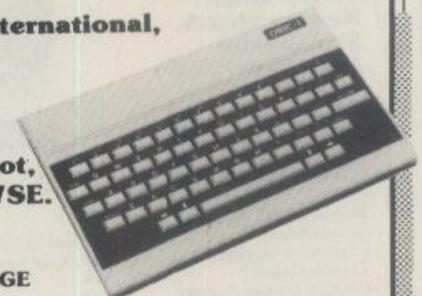
	DETAILS	PRICE
RAM	64 - 512K,	£75 - £445
Printer		
Monitor		
Disc Drives	NYA	--
Other Languages	NYA	--
Multi-user	NYA	--
BASIC extensions	NYA	--

OTHER ADD-ONS:

None Reported.

ORIC 1

Oric Products International,
 Coworth
 Mansion,
 Coworth Park,
 London Road,
 Sunninghill, Ascot,
 Berkshire, SL5 7SE.



STANDARD PACKAGE

Memory Size (RAM) 16K, 48K
 Screen Size 28 X 40
 Expansion Sockets Yes
 Tape Included? No
 Display Unit Included? No
 Usable Domestic TV? Yes
 Size of BASIC 8K
Average Price £99, £169

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	N/A	--
Printer	TBA	--
Monitor	No	--
Disc Drives	TBA	--
Other Languages	N/A	--
Multi-user	No	--
Capabilities	TBA	--
BASIC extensions	TBA	--

OTHER ADD-ONS:

FACTFILE

SHARP MZ-80A

Sharp UK Ltd,
Thorn Road,
Newton Heath,
Manchester
M10 9BE
Tel: 061-205 2333



STANDARD PACKAGE

Memory Size (RAM)	48K
Screen Size	25 lines of 40 characters
Expansion Sockets	BUS connector
Tape Included?	Yes
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	12K
Average Price	£549

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	£450-800
Printer	Yes	—
Monitor	N/A	£600
Disc Drives	Yes, dual	£45
Other Languages	Yes	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:
None Reported

SHARP MZ-80B

Sharp UK Ltd,
Thorn Road,
Newton Heath,
Manchester M10 9BE



STANDARD PACKAGE

Memory Size (RAM)	64K
Screen Size	25 lines of 40 or 80 characters
Expansion Sockets	BUS connector
Tape Included?	Yes
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	16K
Average Price	£990

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	Yes	£120
Printer	Yes	£450-800
Monitor	N/A	—
Disc Drives	Yes, dual	£600
Other Languages	Yes	£45
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Multi-vision and triple-vision, Datron Micro Centre, 2 Abbeydale Road, Sheffield S7 1FD, £35-79

SHARP MZ-80K

Sharp UK Ltd,
Thorn Road,
Newton Heath,
Manchester
M10 9BE



STANDARD PACKAGE

Memory Size (RAM)	48K
Screen Size	25 lines of 40 characters
Expansion Sockets	BUS connector
Tape Included?	Yes
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	12K
Average Price	£350

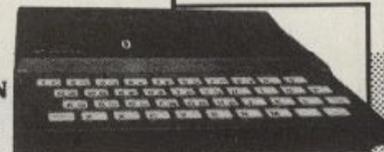
MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	Yes	£450-800
Monitor	N/A	—
Disc Drives	Yes, dual	£600
Other Languages	Yes	£45 upwards
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:
None Reported

SINCLAIR ZX 81

Sinclair Research,
6 Kings Parade,
Cambridge CB2 1SN



STANDARD PACKAGE

Memory Size (RAM)	1K
Screen Size	24 lines of 32 characters
Expansion Sockets	BUS connections
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£49.95 built

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	16K RAM pack	£29.95
Printer	ZX Printer	£59.95
Monitor	No	—
Disc Drives	No	—
Other Languages	No	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Memory expansion unit 16K or 64K, Memotech Ltd, 3 Collins St, Oxford OX4 1XL, £39.95-79; Memory Expansion 64K, Downsway Electronics (UK) Ltd, Dept M, Downsway House, Epsom Road, Ashted, Surrey: £59.95; **Key Bleep Unit**, Microtronix, 3 Buxton Avenue, Coultou, Nottingham, N94 3RK, £8.85 kit, £9.95 built; **Maximem 1.1**, East London Robotics, Finlandia House, 14 Darwell Close, East Ham, London, E84 BT, £93.50; **Music Synthesiser + 16 line control port**, William Stuart Systems Ltd, Dower House, Billicicay Road, Herongate, Brentwood, Essex CM13 3SD, £19.50; **Full-size keyboard**, Protos Computer Systems, Frome Computing, 20 Ashtree Road, Frome, Somerset, BA11 2SF, £64.95; **ZX99 Automatic tape control**, Data-cassette, 44, Shroton Street, London NW1 6UG, £59.95.

SINCLAIR ZX SPECTRUM

Sinclair Research,
6 Kings Parade,
Cambridge, CB2 1SN



STANDARD PACKAGE

Memory Size (RAM)	16-48K
Screen Size	24 lines of 32 characters
Expansion Sockets	BUS connections
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	10K
Average Price	£125 or £175

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	48K RAM for 16K version	£60
Printer	ZX Printer	£59.95
Monitor	No	—
Disc Drives	ZX Microdrive	TBA
Other Languages	No	—
Multi-user Capabilities	No	TBA
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Memory Expansion 32K, Downsway Electronics (UK) Ltd, Dept M, Downsway House, Epsom Road, Ashted, Surrey: £42.50

TANDY TRS 80 I

Tandy Corporation,
12th Floor,
Tameway Tower,
Walsall,
West Midlands
WS1 1LA.



STANDARD PACKAGE

Memory Size (RAM)	4 or 16K
Screen Size	16 lines of 32 or 64 characters
Expansion Sockets	BUS connection
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8 or 12K
Average Price	£229 or £339

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	32K extra in expansion unit	£349
Printer	Yes	£239-1200
Monitor	Yes	£100
Disc Drives	Yes	£369
Other Languages	Yes	£100
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	Yes	£100

OTHER ADD-ONS:

Disc drives, single and dual, Cumana Ltd, 35 Walnut Tree Close, Guildford, Surrey GU1 4UN, £199-799; **Olivetti disc drives single and dual**, Kran Electronics, Victoria House, 17 Highcross St., Leicester LE1 4PF, £179-349; **48K internal RAM**, General Northern Microcomputers, (GNOMIC) 46 Middle Street, Blackhall, Marlepool, Cleveland, £70 + VAT; **32K RAM card**, Audio Computers, 87 Bournemouth Park Road, Southend on Sea, SS5 2JJ, £40 kit, £46 built.

TANDY TRS 80 III

Tandy Corporation,
12th Floor,
Tameway Tower,
Bridge Street,
Walsall,
West Midlands,
WS1 1LA



STANDARD PACKAGE

Memory Size (RAM)	4-48K
Screen Size	16 lines of 32 or 64 characters
Expansion Sockets	BUS connection, parallel & serial output
Tape Included?	No
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	16K
Average Price	£599-1799

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	16K modules	£70
Printer	Yes various	£239-1200
Monitor	N/A	—
Disc Drives	Yes	£600
Other Languages	Yes	£100
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	Yes	£100

OTHER ADD-ONS:

Disc drives, Cumana Ltd, 35, Walnut Tree Close, Guildford, Surrey GU1 4UN, £199-799; **Olivetti disc drives single and dual**, Kran Electronics, Victoria House, 17, Highcross St, Leicester LE1 4PF, £179-349; **48K internal RAM**, General Northern Microcomputers, (GNOMIC), 46 Middle Street, Blackhall, Hartlepool, Cleveland, £70 + VAT; **32K RAM card**, Audio Computers, 87 Bournemouth Park Road, Southend on Sea, SS5 2JJ, £40 kit, £46 built.

TANDY COLOUR

Tandy Corporation,
12th Floor,
Tameway Tower,
Bridge Street,
Walsall,
West Midlands
WS1 1LA



STANDARD PACKAGE

Memory Size (RAM)	16-32K
Screen Size	16 lines of 32 characters
Expansion Sockets	Serial output, ROM pack, joystick socket
Tape Included?	No
Display Unit included?	No
Usable Domestic TV?	Yes
Size of BASIC	8-16K
Average Price	£499

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	Yes various	£239-1200
Monitor	No	—
Disc Drives	Yes	£439
Other Languages	No	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

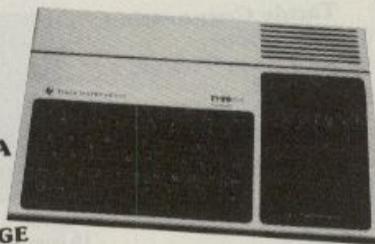
OTHER ADD-ONS:

Olivetti disc drives single and dual, Kran Electronics, Victoria House, 17 Highcross St., Leicester LE1 4PF, £179-349.

FACT FILE

TEXAS TI99/4A

Texas Instruments,
European
Consumer
Division,
Manton Lane,
Bedford MK41 7PA



STANDARD PACKAGE

- Memory Size (RAM) 16K
- Screen Size 24 lines of 32 characters
- Expansion Sockets ROM pack, Bus connector, joystick, socket
- Tape Included? No
- Display Unit Included? No
- Usable Domestic TV? Yes
- Size of BASIC 14K
- Average Price £199

MANUFACTURER'S EXPANSIONS

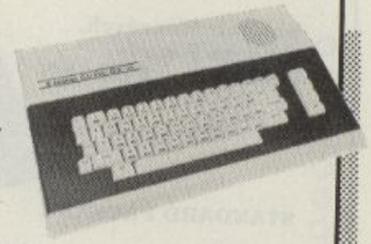
	DETAILS	PRICE
RAM	up to 48K (max)	£300
Printer	Yes	£275
Monitor	No	—
Disc Drives	Yes	£300
Other Languages	Yes	£50-£100
Multi-user	No	—
Capabilities	No	£100
BASIC extensions (Toolkits)	Yes	—

OTHER ADD-ONS:

Speech Synthesiser, Texas Instruments, £46.60; Terminal Emulator II, Texas Instruments, £37.80; RS232 Interface, Texas Instruments.

COLOUR GENIE

Low Computers,
Bently Bridge,
Chesterfield Road,
Matlock
Derbyshire DE4 5LE
Tel: 0629 4995 / 4057



STANDARD PACKAGE

- Memory Size (RAM) 16K
- Screen Size 24 lines of 40 characters
- Expansion Sockets Parallel & serial output, expansion BUS
- Tape Included? No
- Display Unit Included? No
- Usable Domestic TV? Yes
- Size of BASIC 16K
- Average Price £194

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	16K	£38.56
Printer	Yes	£220
Monitor	No	—
Disc Drives	No	—
Other Languages	No	—
Multi-user	No	—
Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

VIDEO GENIE I

Low Electronics,
Bentley Bridge,
Chesterfield Road,
Matlock,
Derbyshire,
DE4 5LE



STANDARD PACKAGE

- Memory Size (RAM) 16K
- Screen Size 16 lines of 64 characters
- Expansion Sockets BUS connector
- Tape Included? Yes
- Display Unit Included? No
- Usable Domestic TV? Yes
- Size of BASIC 12K
- Average Price £279

MANUFACTURER'S EXPANSIONS

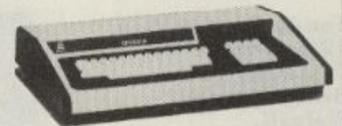
	DETAILS	PRICE
RAM	optional 48K in expansion unit	£200
Printer	Yes	£210
Monitor	Yes	£69-99
Disc Drives	Yes, single and dual	£220-375
Other Languages	No	—
Multi-user	No	—
Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Disc drives, single and dual, Cumana Ltd, 35 Walnut Tree Close, Guildford, Surrey GU1 4UN, £199-799; Olivetti disc drives single and dual, Kram Electronics, Victoria House, 17 Highcross St, Leicester LE1 4PF, £179-349; EG3014 Expansion box with 16K/32K RAM, Swanley Electronics, 32 Goldsel Road, Swanley, Kent BR8 8EZ, £199-213 48K internal RAM, General Northern Microcomputers, GNDMIC, 46 Middle Street, Blackhall, Martlepool, Cleveland, £70 + VAT; 32K RAM Card Audio Computer, 87 Bournemouth Park Road, Southend-on-sea, SS5 2JJ, £40 kit, £46 built.

VIDEO GENIE II

Low Electronics,
Bentley Bridge,
Chesterfield Road,
Matlock,
Derbyshire DE4 5LE



STANDARD PACKAGE

- Memory Size (RAM) 16K
- Screen Size 16 lines of 32 or 64 characters
- Expansion Sockets BUS connector
- Tape Included? No
- Display Unit Included? Yes
- Usable Domestic TV? 13K
- Size of BASIC 13K
- Average Price £299

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	optional 48K in expansion unit	£200
Printer	Yes	£210
Monitor	Yes	£69-99
Disc Drives	Yes, single and dual	£220-375
Other Languages	No	—
Multi-user	No	—
Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Disc drives, single and dual, Cumana Ltd, 35 Walnut Tree Close, Guildford, Surrey, GU1 4UN, £199-799; Olivetti disc drives single and dual, Kram Electronics, Victoria House, 17 Highcross St, Leicester LE1 4PF, £179-349; EG3014 Expansion box with 16K/32K RAM, Swanley Electronics, 32 Goldsel Road, Swanley, Kent BR8 8EZ, £199-213; 48K internal RAM, General Northern Microcomputers, GNDMIC, 46 Middle Street, Blackhall, Martlepool, Cleveland, £70 + VAT; 32K RAM Card Audio Computers, 87 Bournemouth Park Road, Southend-on-sea, SS5 2JJ, £40 kit, £46 built.

SPECTRUM

24 LINE INPUT/OUTPUT PORT	£18.95
(motherboard not required)	
MOTHERBOARD - SIX SLOTS	£26.50
MOTHERBOARD PCB ONLY	£ 6.50
SPECTRUM 28 WAY CONNECTOR	£ 3.25
MALE CONNECTOR	£ 1.90
34 WAY RIBBON CABLE	per metre £ 1.80

ZX81

40 KEY KEYBOARD	£20.00
SPARE KEYS	each £ 0.30
MOTHERBOARD - TWO SLOTS	£15.00
24 LINE INPUT/OUTPUT PORT	£18.95
16K RAM PACK	£22.95
MUSIC BOARD	£18.95
23 WAY FEMALE CONNECTOR	£ 2.50
MALE CONNECTOR	£ 1.60
24 WAY RIBBON CABLE	per metre £ 1.40
GETTING ACQUAINTED WITH YOUR ZX81	£ 5.95
PROGRAMMING FOR REAL APPLICATIONS	£ 6.95
REAL APPLICATIONS TAPE	£11.44
MASTERING MACHINE CODE	£ 7.50

Prices are for built items. Postage 40p under £4.00.
Export postage (surface) £1.80. Send SAE for full catalogue.
Cash with order or ACCESS

REDDITCH ELECTRONICS

PCT, 21 FERNEY HILL AVENUE,
REDDITCH, WORCS B97 4RU

SOFTWARE FOR THE VIC AND COMMODORE 64

BUGSY (Joystick only)	£5.50
You are in a minefield: collect all the yellow bombs before the time runs out by moving on the blue stepping stones. Gain extra time and score by collecting the purple boxes but watch out for the mines marked with red cross bones. Sounds easy? Every stone you step on disappears, as you move around the screen you leave an empty trail but not to worry, a loveable little green creature called BUGSY moves around randomly filling in the empty spaces but run into him and he turns nasty and your dead. Clear the screen and another appears with more mines. How long can you stay alive? A very original, compulsive and challenging game.	
JACKPOT Own a fruit machine, just like the real thing, can you win the jackpot, you will be amazed by the graphics, colours, and many sound effects, with nine different tunes, a full machine code program, a very compulsive game	£5.50
SWAG-MAN Chase the bullion van round the streets of New York, picking up the swag, but beware you must defuse the time bombs, to gain extra time and fuel, full colour and sound effects, a very original game, requires 3K expansion	£5.50
DATABASE Create your own files and records on tape	£7.50
BANK MANAGER Computerise your bank account	£5.00
SUPER BANK MANAGER A full feature version, needs 3K expansion, but will run on any memory size	£7.50
M/C SOFT Machine code monitor and disassembler, any memory size	£7.50
CHARACTER EDITOR With our own window facility	£4.50
Full documentation with all utility programmes.	
COMMODORE 64:	
LUNAR RESCUE Our own machine code version of that popular arcade game	£7.50
M/C SOFT 64 Machine code assembler and disassembler	£7.50
Other software available for the VIC and Commodore 64, send for free brochure.	

CHEQUES/P.O.s TO:

MR CHIP SOFTWARE

Dept PCT, 1 Neville Place, Llandudno, Gwynedd LL30 3BL. Tel: 0492 49747.

WANTED: Good quality software, top royalties paid.

New Super JRS Software Competition!

for DRAGON 32, VIC-20, and BBC programs - ENTER NOW and

WIN £250 PLUS

A 14" COLOUR T.V.

Second prize of £150, 3 Third Prizes of £50 each.

As an added bonus, JRS Limited may offer you a substantial cash payment for the distribution rights to your program, even if you do not win a prize. To be eligible, you must own the copyright to the entry, and it must not be already marketed in the U.K. or Overseas. Entries are restricted to U.K. residents only, and must be received by **31st July, 1983.**

All programs submitted must be accompanied by an official entry form available from JRS Software Limited, which contains full details of the rules and conditions of the competition.

Fill in the coupon below to JRS Limited Summer Competition, and post it today and enclose a large stamped addressed envelope.

ZX SOFTWARE COMPETITION RESULTS:-

- 1st Prize - K. D. Pridmore, Ilkeston, Derby.
2nd Prize - D. A. Elliott, Ulverston, Cumbria.
3rd Prizes - N. Beer, Longdown, Exeter; K. R. Browne, Wakefield, West Yorkshire; W. I. Cooksey, Harlton, Cambridge.

Please send me an entry form for the Super JRS Summer Competition.

Name

Address

For a copy of the JRS Catalogue, enclose £1.00 (refundable against first purchase)

Ref: PCT 8

JRS SOFTWARE
19 WAYSIDE AVENUE, WORTHING, SUSSEX. BN13 3JU Telephone: (0903) 65691

COMPUSOUND TELESOUND 84

"THE ONLY ONE OF ITS KIND TO
FIT INSIDE THE SPECTRUM"

Probably the worlds smallest modulator!

TELESOUND 84 is ready built and tested so get full Spectrum sound through your unmodified television set, black/white or colour. The unit can be fitted in minutes without any previous experience. Telesound 84 has been developed using the very latest ultra miniature components so that the size is kept to an absolute minimum.

TELESOUND 84 FEATURES

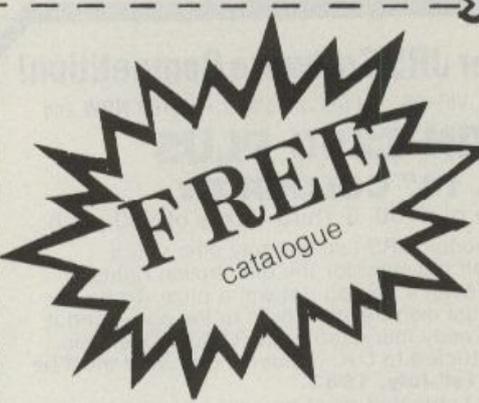
- Sound and vision together for added realism
- Beep volume controllable from a whisper to a roar
- Keyboard prompt click clearly hard to assist program entry
- Programs can be heard when loaded
- Compatible with all other ZX add ons
- No soldering or case cutting required
- Additional amplifier not necessary
- Separate power supply not required

TELESOUND 84 comes complete with a free sound effects program and costs **£9.95** inclusive of post, packing etc. Please state your computer when ordering (allow 28 days delivery).



COMPUSOUND

32 Langley Close, Redditch,
Worcs B98 0ET



VIC 20
ZX81
SPECTRUM
DRAGON

**PROBABLY
THE FINEST SELECTION OF
SOFTWARE**

**FREE OFFERS
FREE VOUCHERS
FREE GIFTS**

FOR FURTHER DETAILS.
send large S.A.E. for catalogue (state which computer)

ROMOCO
33 victoria rd. timperley, cheshire.

48K ORIC 1
ONLY £159.00

DRAGON 32
ONLY £189.00

Including VAT and Postage

Available From Stock For Immediate Delivery

FROM: ACCESS PERSONAL COMPUTERS LTD
DEPLEACH HALL, WILMSLOW ROAD
CHEADLE, CHESHIRE

Please supply for immediate delivery

ONE 48K ORIC 1 MICROCOMPUTER @ £159.00

ONE DRAGON 32 MICROCOMPUTER @ £189.00

ENCLOSED CHEQUE/P.O. No. FOR £

ACCESS/BARCLAY CARD HOT ORDER LINE
TELEPHONE 061-483 9140

Please allow 14 days for delivery



**IF YOU HAVE A BBC MICRO
THEN YOU NEED**

LASERBUG

Laserbug is the newsletter of the Independent National BBC Microcomputer Users Group. If you want the best source of information in the BBC Micro you can't do without Laserbug. No matter what your interest - hardware, software, business, games or education then Laserbug has something for you.

Also, Laserbug has available many special offers including dust covers (for computer, monitor, printer, disks), cassette leads and 1.2 ROMS FOR ONLY £5.50 INCLUSIVE - THE CHEAPEST PRICE ANYWHERE (Members Only)

Laserbug defies description - send off for a sample copy and you'll find that it sells itself to you. See one and you'll be hooked for life!!!

Please supply me with

- more details about Laserbug and your special offers
- a sample copy for £1.00 and an A4 SAE (17p postage)
- 1 UK 12 Month Subscription for £12.00
- 1 UK 6 Month Subscription for £6.00
- 1 Overseas Surface Mail Subscription for £14.00 (air mail rates on application)

Please send the goods to:

NAME ADDRESS

I enclose a cheque/PO for £ p made payable to LASERBUG.

Please send the form to LASERBUG Dept. C, 10 Dawley Ride, Coombe, Slough, Berks, SL3 0QJ.

They came suddenly — without warning — they attacked our planet — viciously and without mercy — the remnants of human kind were scattered throughout the Galaxy — the outsiders took our planet for themselves — built huge ugly cities deep underground — each city housed their ultimate power units — although it has taken 10,000 of your years we have gathered together and developed a ship capable of flying through their defences — we request you fly this ship and deliver the deadly missile into the heart of each and every city you can find — destroy the outsiders and give us back our beloved planet. This is not an easy mission. Complete it and we shall be eternally grateful.

HIDDEN CITY

for the 48K Spectrum only **£5.95**

BYTEWELL
203 Court Road, Barry,
South Glamorgan CF6 7EW
Tel: (0446) 74249

DEALER ENQUIRIES WELCOME
GENEROUS DISCOUNTS AVAILABLE

SOFTWARE LISTING

Looking for a program to buy? Look no further! If it's available, it's listed here in our exclusive and comprehensive software checklists.

Looking through any computer magazine can be a bewildering experience if you're in search of a program. Count the hundreds of ads and thousands of titles on sale and it would be easy to lose heart!

We've tried to sort out the confusion, and the sheer numbers, to present an easily understood list for each machine. Where possible, we have eliminated duplications, so that the same tape with a different label is not listed twice. Rather it should be credited once, with as many suppliers as we could find.

Table Codes

In order to fit as many programs as possible into our pages, we have had to use codes for some columns, considerably shortening the wording.

The information given for each program is: Title, memory required to run it, company producing it,

whether tape/cartridge or disk, type and supplier and price.

The codes we have used are:

Program Type

- GM = Game
- BS = Business routine
- UT = Utility (ie. programming aid)
- DO = Domestic
- ED = Educational

How Sold

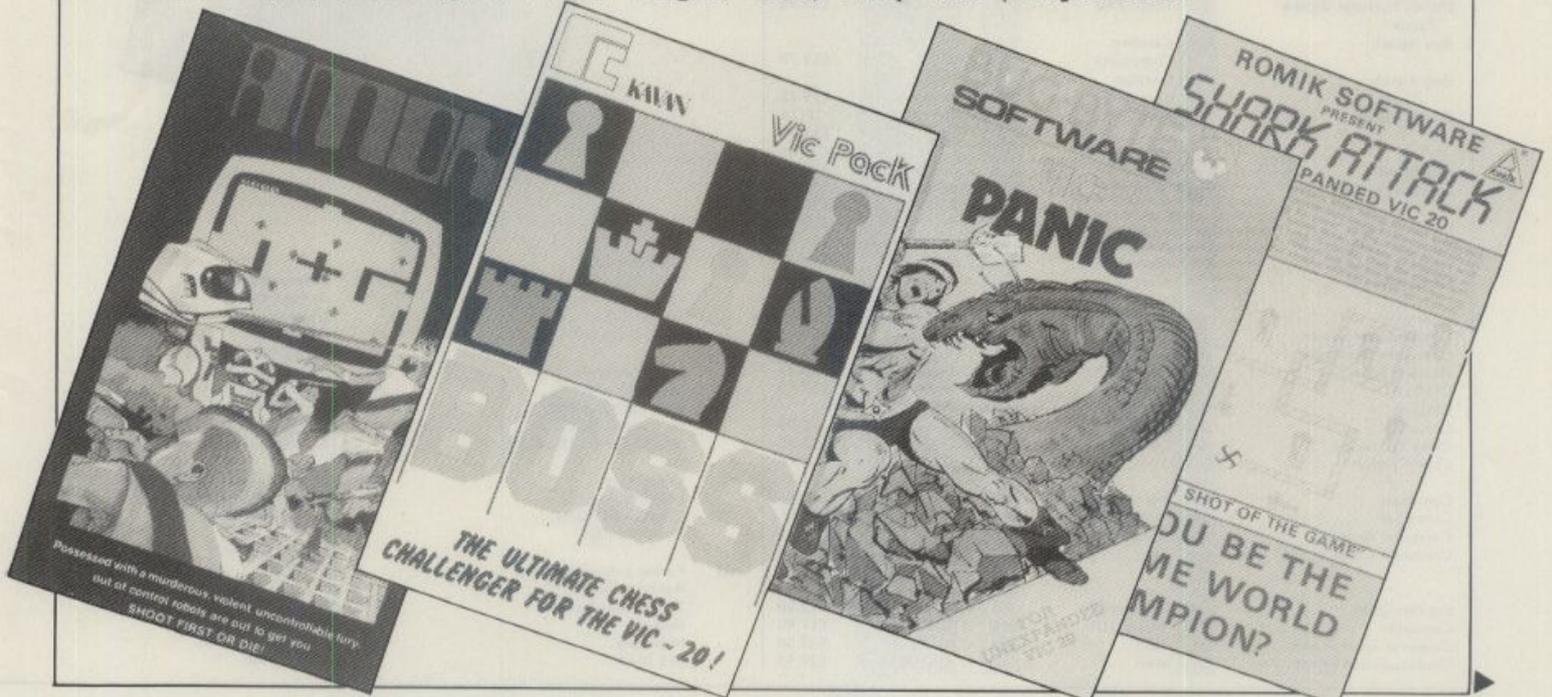
- R = Cartridge (may include memory)
- C = Tape (cassette)
- D = Disc (for expanded systems)
- L = Listing (sold as print-out)

Due to overwhelming response we have been forced to alternate machines included in our checklist each month. Out this month are the VIC, Dragon, BBC, Sharp and

TRS-80. But don't panic, they will be featured in September for you to make your software selection. You'll notice that this month we have reverted to our policy of including suppliers address. This will help you order your software immediately.

Not Here?

To companies whose products are not listed herein we can only say TELL US ABOUT IT! This applies particularly to the smaller retailer who may sell only half a dozen or so programs for one machine. If you produce software for any of the machines on the market today, then we would love to include your wares in our checklists. Send it in to us, marked for the attention of the Editor (in our format Please!) or ring Chris Palmer on 01-437 1002 as soon as possible.



SOFTWARE DEALERS

Conversational German	Ed	Atari	16K	C AC,BC,JK	£32.50
Conversational German	Ed	Atari	16K	R AB,HM,JK	£39.95
Conversational Italian	Ed	Atari	16K	R AB,HM,JK	£39.95
Conversational Italian	Ed	Atari	16K	C AC,BC,JK	£32.50
Conversational Spanish	Ed	Atari	16K	R AB,HM,JK	£39.95
Conversational Spanish	Ed	Atari	16K	C AC,BC,JK	£32.50
Convoy Raider	Gm	Avalon Hill	16K	C BH	£10.95
				GB,AB	£12.50
Crazitack	Gm	Allrian	16K	C JS	£16.00
Cribbage and Dominoes	Gm	Thorn EMI	16K	C CH,BC,HM,IK	£14.95
Cross Fire	Gm	On Line	16K	C HM	£19.95
Cross Fire	Gm	On Line	32K	D HM	£19.95
Crush, Crumble, Chomp	Gm	Avalon Hill	16K	C GB,JK	£15.50
Crush, Crumble, Chomp	Gm	Avalon Hill	16K	D GB,JK	£17.95
Crypts of Terror	Gm	In Home S/W	16K	C CH,HM	£19.95
Curse of Rah	Gm	Auto Simulations	32K	C JR	£13.80
Curse of Rah	Gm	Auto Simulations	32K	D JR	£13.80
Curse of Crawley Manor	Gm	Adventure Int.	16K	C AB	£16.50
Cyclod	Gm	Sirius Software	32K	D JR	£19.25
Cypher Bowl	Gm	Artsci Inc.	32K	D BC	£22.45
DI Nuclear Bomber	Gm	Avalon Hill	16K	C BH	£10.95
Darts	Gm	Thorn EMI	16K	C CH,BC,HM,IK	£19.95
Data Management S/W	Bs	C E S/W	48K	D AB	£101.00
Data Management System	Du	Atari	32K	D AB	£20.50
Datestone of Ryn	Gm	Avalon Hill		D GB,JK	£15.50
Datestone of Ryn	Gm	Avalon Hill		C BC	£14.95
				GB,JK	£13.50
Deadline	Gm	Infocom	32K	C JR	£34.50
Deflections	Gm	Adventure Int.	8K	C AB,JK	£12.50
DeLuxe Invaders	Gm	Rocklan	32K	D JR	£22.99
Disc Fixer	Ut	Atari	16K	D AB	£22.50
Diskassembler	Ut	Allrian	32K	D JS	£27.95
Display List	Ed	Santa Cruz	16K	C BC	£9.95
Display List	Ed	Santa Cruz	16K	D BC	£10.95
Dnieper River	Gm	Avalon Hill	48K	C BH	£15.95
				CH	£14.50
Doctor Goodcodes Cavern	Gm	Gebelli Software	32K	D JR	£18.95
Domination	Gm	Atari	24K	C GC	POA
				AB	£16.75
		Allrian	24K	C JS	£16.00
Dos 2	Ut	Atari	32K	D AB	£21.95
Dragon of Hong Kong	Gm	Adventure Int.	32K	C AB	£16.50
Drawpic	Ut	Artworx	16K	C JR	£22.75
Drawpic	Ut	Allrian	16K	C JS	£24.50
Drawpic	Ut	Artworx	16K	D JR	£25.00
Eastern Front	Gm	Atari	16K	C CH	£24.95
Eastern Front	Gm	Atari	16K	D AB	£30.25
Empire of the Overmind	Gm	Avalon Hill		C BH	£17.95
				CH	£18.95
				D GB,AB	£24.95
Empire of the Overmind	Gm	Avalon Hill		C JS	£19.50
Encounter at Questar IV	Gm	Allrian	24K	C JS	£19.50
Escape from Tramm	Gm	Adventure Int.	16K	C AB	£16.50
European Capitals	Ed	Atari	16K	C AC,BC,AB,HM,JK	£8.95
				AB,HM,JK	£9.95
European Scene Jigsaw	Gm	Thorn EMI	16K	C BC,HM,JK	£19.95
Puzzle					
Extended WSNA	Ut	Atari	16K	C AB	£19.00
Fantasy land 2041	Gm	Chrystal	48K	C CH,AB,JK	£34.99
Fastgammon	Gm	Quality S/W	16K	C BC	£9.95
Forest Fire	Gm	Dinacomp	24K	C AB,JK	£15.99
Frog	Gm	C E S/W	16K	C AB	£9.95
Frogger	Gm	On Line	16K	C HN	£22.95
Frogger	Gm	On Line	32K	D HN	£22.95
Galactic Chase	Gm	Spectrum	16K	C AB,BC,HM	£15.99
Galactic Chase	Gm	Spectrum	16K	D AB	£20.25
Galactic Chase	Gm	Spectrum	16K	D BC,HM	£17.95
Galactic Empire	Gm	Adventure Int.	32K	C BC	£14.95
				AB,JK	£16.50
Galactic Guest	Gm	Chrystal	48K	C CH,AB,JK	£19.99
Galactic Trader	Gm	Adventure Int.	32K	C AB,CH,JK	£16.50
Galaxy	Gm	Avalon Hill	16K	C BH	£12.95
Galaxy	Gm	Avalon Hill	16K	D BH	£14.95
Ghost Hunter	Gm	Arcade Plus	16K	C HM	£19.95
Ghost Hunter	Gm	Arcade Plus	16K	D HM	£22.95
Ghost Town	Gm	Adventure Int.	24K	C BC	£14.95
				AB,JK	£16.50
Giant Slalem	Gm	Dinacomp	16K	C AB	£11.99
Golden Voyage	Gm	Adventure Int.	24K	C BC	£14.95
				AB	£16.50
Gomoku	Gm	Artsci Inc	16K	C BC	£14.95
Graph it	Ut	Atari	16K	C AC,BC,JK,AB,HM	£11.95
				AB,HM	£13.95
				GC	POA
				AB	£16.75
Graphic Sound Demo	Gm	Atari	16K	D GC	£16.75
				AB	£13.50
Graphics Machine	Ut	Santa Cruz	16K	C AB	£12.95
Guns of Fort Defiance	Gm	Avalon Hill	32K	C BH	£12.95
HMS Impetuous	Gm	Adventure Int.	32K	C AB	£16.50
Hangman	Gm	Atari	16K	C AC,BC,AB,HM,JK	£8.95
				AB,HM,JK	£9.95
Hickory Dickory Dock	Gm	Thorn EMI	16K	C BC,HM,JK	£19.95
Home Financial Mg'ment	Dm	Thorn EMI	16K	D HM	£29.95
Horizontal/Vertical Scrolling	Ed	Santa Cruz	16K	C AB	£13.95
House of Usher	Gm	Chrystal	48K	C AB,CH,JK	£19.99
Humpty Dumpty/Jack & Jill	Gm	Thorn EMI	16K	C BC,HM,JK	£19.95

AP KGB Micros Ltd
14 Winsor Road
Slough
Berks
Slough (0753) 38581/38319

AQ Broadside
2 The Spinney
North Cray
Kent

AR Software Ltd
387 8832/388 9927

AS Lucas Logic Ltd
Nascom Microcomputers
Division
Welton Road
Wedgcock Industrial Estate
Warwick CV34 5PZ

AT Atlantic Micro System
70-72 Honor Oak Park
London SE23 1DY
01 699 2202

AU TCL Software
59/61 Theobalds Road
London WC1
405 5240/2113

AY Microstore
327 Kings Road
London SW3
352 9291

AZ London Retail
98 Moysen Road
London SW16 6SH
01 677 2052/7341

BA Micro-Spares
19 Roseburn Terrace
Edinburgh EH12 5NG
031 337 5611

BB CAPS Ltd
28 The Spain
Petersfield
Hampshire
GU32 3LA

BC Maplin
PO Box 3
Rayleigh
Essex
0702 552911/554155

BD Caxton Software
Publishing Co.
10-14 Bedford Street
Covent Garden
London WC2
01 379 6502

BE Cornshall Ltd
32-34 Great Peter Street
London SW1



AV IAS
Cambridge Road
Orwell
Royston
Herts
0223 207689

AW Intelligent Artefacts Ltd
Cambridge Road
Orwell
Royston
Herts
0223 207689

AX Kuma Computers
11 York Road
Maidenhead
Berks
0628 71778

BF Micro Technology
Royal Sussex Assembly Rooms
The Pantiles
Tunbridge Wells
Kent
0892 32116

BG Eicon Research Ltd
Viking Way
Banhill
Cambridge CB3 8EZ
0954 81825

BH Avalon Hill Games
650 High Street
North Finchley N12
445 3044

REFERENCE

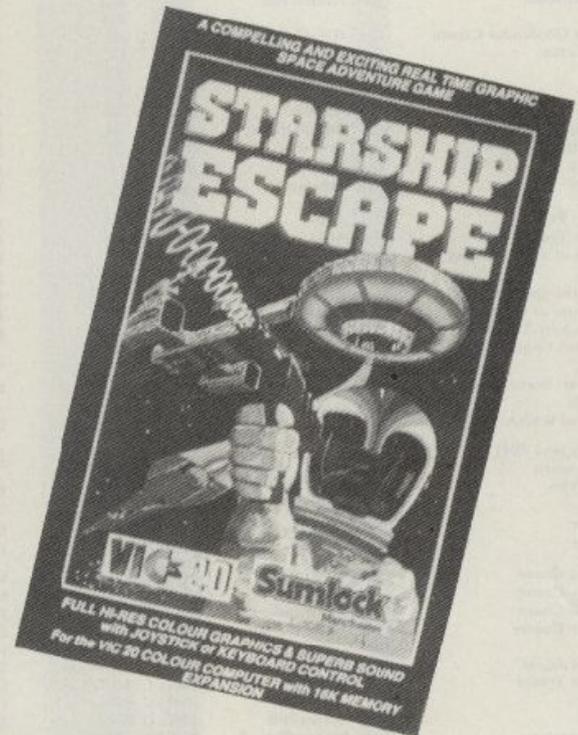
SOFTWARE LISTING

ATARI

Title	Program Type	Program Produced By	Memory Req'd	How Sold	Supplier Codes	Prices
Intruder Alert	Gm	Dinacomp	16K	C	AB,IK	£15.99
Invasion Orion	Gm	Avalon Hill		C	CB,IK	£13.25
Invasion Orion	Gm	Avalon Hill		D	GB,IK	£15.75
Invitation to Prog I	Ed	Atari	16K	C	AB,HM,IK	£15.95
Invitation to Prog. II	Ed	Atari	16K	C	GC,IK	POA
					AB,BC,HM	£22.95
Invitation to Prof. III	Ed	Atari	16K	C	AB,BC,HM,IK	£22.95
Nautilus	Gm	Synapse	32K	C	HM	£20.00
Nomino's Jigsaw	Gm	Dinacomp	24K	C	AB,IK	£15.99
Norton Forth	Gm	Adventure Int.	32K	C	AB	£24.95
Nuke War	Gm	Avalon Hill	16K	C	BH	£10.95
Old McDonald's Farm	Gm	Adventure Int.	16K	C	AB	£12.50
Operating System A Plus	Ut	OSS S/W	48K	D	BC	£52.50
Outlaw Howitzer	Gm	Atari	24K	C	GC	POA
					AB	£16.75
Pacific Coast Highway	Gm	Datasoft	16K	C	HN	£20.00
Pacific Coast Highway	Gm	Datasoft	16K	D	HN	£20.00
Pac-Man	Gm	Atari	16K	R	GC,IK,BC,HM	£29.95
Page Flipping	Ed	Santa Cruz	16K	C	BC	£9.95
Page Flipping	Ed	Santa Cruz	16K	D	BC	£10.95
Personal Finance	Gm	Atari		R	BC,HM,IK	£49.00
Pilot (Educator)	Ut	Atari	16K	C/R	AB,BC,HM	£79.95
Pirate Adventure	Gm	Adventure Int.	24K	C	BC	£14.95
					AB,IK	£16.50
Planet Miners	Gm	Avalon Hill	24K	C	BH	£10.95
Player Missile Graphics	Ed	Santa Cruz	24K	D	BC	£19.95
Player Missile Graphics	Ed	Santa Cruz	24K	C	BC	£18.95
					AB	£19.95
Poker & Solitaire	Gm	Artscl Inc.	16K	C	BC	£10.95
Program Pack I	Ut	Avalon Hill	16K	C	GB	£3.50
Protector	Gm	Synapse	32K	C	HN	£19.95
Purchase Ledger	Bs	Atari	48K	C	AB,IK	£149.95
Pyramid of Doom	Gm	Adventure Int.	24K	C	BC,AB,IK	£14.95
					AB,IK	£16.50
QS Forth	Ut	Quality S/W	24K	D	BC	£44.90
Quest for Power	Gm	Chrystal	48K	C	CH,AB	£26.99
Race in Space	Gm	Analog S/W	16K	C	BC	£14.95
Race in Space	Gm	Analog S/W	16K	C	HN	£15.95
Race in Space	Gm	Analog S/W	16K	D	HN	£15.95
Raster Blaster	Gm	Budgeo	32K	C	HN	£22.95
Rescue at Rigel	Gm		32K	C	BC,IK	£22.45
Reversi	Gm	Artscl Inc	16K	C	BC	£14.95
Rings of the Empire	Gm	Dinacomp	16K	C	AB,IK	£15.99
Rotate and Tilt	Gm	Thorn EMI	16K	C	BC,HM	£14.95
Sales Ledger	Bs	Atari	48K	C	AB,IK	£149.95
Sands of Mars	Gm	Chrystal	48K	C	CH,AB,IK	£26.99
Savage Island I	Gm	Adventure Int.	24K	C	BC,IK	£14.95
Scram	Gm	Atari	16K	C	GC,IK,AB,CH,HM	POA
					AB,CH,HM	£17.50
Shooting Arcade	Gm	Datasoft	16K	C	HM	£20.00
Shooting Arcade	Gm	Datasoft	16K	D	HM	£20.00
Shooting Gallery	Gm	Analog S/W	16K	C	BC	£15.95
Shooting Gallery	Gm	Analog S/W	16K	D	BC	£15.95
Six Microstories	Gm	Adventure Int.	32K	C	AB	£12.50
Sky Warrior	Gm	Adventure Int.	16K	C	AB	£16.50
Snake Byte	Gm	Sirius Software	32K	D	JR	£19.25
Snooker and Billiards	Gm	Thorn EMI	16K	C	BC,HM,IK	£19.95
Sound Editor	Gm	Atari	16K	C	GC,AB	POA
					AB	£16.75
Sound Tutorial	Ed	Santa Cruz	16K	C	AD	£13.95
Space Ace	Gm	London S/W	16K	C	HM	£19.95
Space Ace	Gm	London S/W	16K	D	HM	£19.95
Space Invaders	Gm	Atari	16K	R	AB,CH,HM,BC,IK	£19.95
Space Tilt	Gm	Dinacomp	16K	C	AB,IK	£29.95
Space Trap	Gm	Allirian	16K	C	JS	£15.50
Space Trap	Gm	Dinacomp	24K	C	AB,IK	£9.99
Space Trek	Gm	Atari	24K	C	CC,AB,HN	POA
					AH	£13.50
Star Raiders	Gm	Atari	16K	R	HM,AC,BC,CH,IK	£29.95
Star Trek 3.5	Gm	Adventure Int.	32K	C	BC,AB	£14.95
					AB	£16.50
Star Warrior	Gm	Epyx	32K	C	BC,IK	£28.95
States and Capitals	Ed	Atari	16K	C	AC,BC,IK,AB,HM	£8.95
					AB,HM	£9.95
Statistics I	Fm	Atari		C	AC,BC,IK	£11.95
Stock and Bonds	Gm	Avalon Hill	32K	C	BH	£12.95

SOFTWARE DEALERS

BI	Call Apple (UK) c/o SBD Software, Freepost Richmond Surrey 940 5194	BR	IBR Microcomputers Suttons Industrial Park London Road Earley Reading 0734 664111
BJ	Lifeboa: Associates PO Box 125 London WC2H 9LU 836 9028	BS	Computer Plus 47 Queens Road Watford Herts WD1 2LH 0923 33927
BK	L & J Computers 192 Honey Pot Lane Queensbury Stammore Middlesex HA7 1EE 204 7525	BT	The Essential Software Co. (Visconti Ltd) 47 Brunswick Centre London WC1 866 5445
BL	Peach Tree Software International MSA House 99 King Street Maidenhead Berks 0628 7:011	BU	Guestel 8-12 New Bridge Street London EC4 583 2255
BM	ACT (Microsoft) Ltd Freepost Birmingham B16 8BR (David Low) 021 454 8585	BV	Low Electronics Chestersfield Road Matlock Derbyshire DE4 5LE 0629 4995
		BW	Gate Micro System Ltd The Nethergate Centre 35 Yeaman Shore Dundee 0382 28194



BN	Personal Computer Palace 4-6 Castle Street Reading Berks 0734 589249	BX	Abbey House Bothwell Street Glasgow 041-221-9372
BO	Sinclair Software Sinclair Research Ltd 6 Kings Parade Cambridge CB2 1SN 0276 66104	BY	Almarc Data Systems Ltd Great Freeman Street Nottingham NG3 1FR 0602 52457/8/9
BP	Leicester Computer Centre Ltd 67 Regent Road Leicester LE16YF 0533 556268	BZ	Interam Computer Systems Ltd 46 Balham High Road London SW12 675 5325/6/7
BQ	TABs Ltd Sopers House Chantry Way Andover Hants SP10 1JU 0264 58933	CA	Terodec Ltd Unit 58 Suttons Park Avenue Earley Reading 0734 664343/6

SOFTWARE DEALERS

Stone of Sisyphus	Gm	Adventure Int.	24K	C BH	£12.95
Strange Odyssey	Gm	Adventure Int.	24K	C BC,IK	£14.95
				AB	£16.50
Stud Poker	Gm	Dinacomp	16K	C AB,IK	£10.99
Stud Poker	Gm	Allrian	16K	C JS	£14.00
Submarine Commander	Gm	Thorn EMI	16K	C BC,HM,JK	£24.50
Summer	Gm	Chrystal	16K	C AB	£11.99
Sunday Golf	Gm	Adventure Int.	16K	C AB,IK	£16.50
Super Breakout	Gm	Atari	16K	C AC,HM,JK	£24.50
Super Breakout	Gm	Atari	16K	R AB,IK	£35.95
T:A Text Display Device	De	Allrian	16K	C JS	£16.00
Tack Trek	Gm	Atari	24K	C GC	POA
				AB	£13.50
Tank Trap	Gm	Quality S/W	16K	C BC	£8.95
Tank Trap	Gm	Quality S/W	16K	D BC	£11.95
Tanktrics	Gm	Avalon Hill	32K	C CH	£16.95
Tari Trek	Gm	Quality S/W	16K	C BC	£8.95
Teachers Pet	Ed	Allrian	16K	C JS	£14.00
Tari Trek	Gm	Quality S/W	16K	D BC	£11.95
Tele Link	Gm	Atari	16K	R HM,JK	£21.50
Tele Link	Ut	Atari	16K	R AB,JK	£19.95
Teelink	Ut	Data Soft	16K	R BC,JK	£14.95
Terrie	Gm	Atari	32K	C GC	POA
				AB	£16.75
Text Editor	Bs	Allrian	32K	D JS	£30.00
Text Wizard	Ut	Data Soft	16K	D AB	£99.95
The Count	Gm	Adventure Int.	24K	C BC,IK	£14.95
				AB	£16.50
The Cranston Manor					
Adventure	Gm	Allrian	32K	D JS	£30.00
The Vaults of Zurich	Gm	Allrian	24K	C JS	£19.50
The Predictor	Bs	Allrian	32K	D JS	£27.95
The Rings of the Empire	Gm	Allrian	16K	C JS	£15.50
Threshold	Gm	On-Line	32K	C HM,JK	£24.95
Thunder Island	Gm	Analog S/W	16K	C BC	£10.95
Touch Typing	Ed	Atari	16K	C AC,BC,JK	£14.95
				AB,HM	£15.95
Tournament Pool and 8 Ball Pool	Gm	Thorn EMI	16K	C CH,BC,HM	£19.95
				IK	
Track Attack	Gm	Broadsa Bond	32K	D HM	£32.95
Triple Blockade	Gm	Dinacomp	16K	C AB,IK	£12.99
Tumble Bugs	Gm	Datasoft	24K	D HM	£19.95
Two Heads of the Coin	Gm	Adventure Int.	32K	C AB	£16.50
Ulysses	Gm	On-Line	40K	D HM	£24.95
Video Easel	Gm	Atari	16K	R GC,IK	POA
				AB,BC,HM	£24.50
Visicalc	Bs	Personal S/W	32K	D BC,IK	£119.95
Voodoo Castle	Gm	Adventure Int.	24K	C BC,IK	£14.95
				AB	£16.50
Voyager	Gm	Avalon Hill	32K	C CH,BH	£12.95
Waterloo	Gm	Chrystal	48K	C CH,IK	£32.99
Wizard and the Princess	Gm	On Line	48K	D CH,IK	£22.95
World War III	Gm	Chrystal	48K	C CH,AB,JK	£19.99

ATOM

3-D Asteroids	Gm	Program Power	5K	C GK	£6.85
747 Flight simulator	Gm	Bug Byte	12K	C CH,GA,GB	£8.00
Adventure	Gm	Program Power	12K	C CH,GK	£9.15
Adventures	Gm	Acornsoft	12K	C EJ	£30.00
Air Attack	Gm	Program Power	12K	C CH,GK	£9.15
Air Attack	Gm	Program Power	12K	C GK	£7.95
Air Strike	Gm	Pro S/W	9K	C LD	£6.00
Alien Maze	Gm	Program Power	8K	C GK	£5.69
Astrafire	Gm	Program Power	5K	C GK	£4.54
Astro Birds	Gm	Program Power	12K	C CH,GK	£9.15
Atom Adventure	Gm	Acornsoft	12K	C GA,AL	£11.50
Atom Adventure	Gm	Hopesoft	12K	C JV	£6.75
Atom Breakout	Gm	Bug Byte	4K	C HO	£4.00
Atom Business Games	B,G	Program Power	12K	C GK	£7.99
Atom Business Cassette	Bt	Acornsoft		C AL	£7.50
Atom Business Pack	Bs	Acornsoft		C AY,FA	£11.50
Atom Chess	Gm	Acornsoft	12K	C GA,EA,AL	£11.50
Atom Chess	Gm	Acornsoft	12K	C GK	£11.44
Atom Forth	Ut	Acornsoft		C GA,EJ,AL	£11.50
Atom Invaders	Gm	Bug Byte	12K	C HO	£8.00
Atom Life Category	Bs	Acornsoft		C AL,GA	£11.50
Atom List	Ut	Acornsoft		C AL	£17.25
Atom Man	Gm	Hopesoft	12K	C JV	£6.75
Atom Store	Bs	Program Power	12K	C GK	£9.15
Atom Synthesiser	Gm	Acornsoft	12K	C AL,GA	£11.50
Atomic Cube	Gm	A&F S/W	12K	C GE	£4.95
Backgammon	Gm	Bug Byte	7K	C GA	£7.00
Blitz	Gm	Rucksoft	4K	C KO	£2.65
Chaser	Gm	Hopesoft	4K	C JV	£3.75
Chess	Gm	Bug Byte	12K	C CH,GA,GB	£9.00
Chess	Gm	Program Power	12K	X GK	£9.15

CB	Poolsoft 17 Blatchington Road Saford East Sussex 0323 890604	CW	Cambell Systems Rous Road Buckhurst Hill Essex IG9 6BL
CC	Highlight Software 3 Nether Court Halstead Essex 0787 475714	CX	Microdeal Deal House Bridges Bpdmn Cornwall
CD	Omega Plus 2c Graham Road London E8 1BZ	CY	Prof. F. H George Bureau of Information Science Commerce House High Street Chalfont St Giles Bucks
CE	Southern Software PO Box 39 Castleigh Hants S05 5WQ	CZ	J Wolstencroft Sagar Fold Preston Chipping (09956) 327
CF	Sigma Systems 54 Park Place Cardiff Cardiff 21515/34869	DA	Ground Control Alfreda Avenue Hullbridge Essex S55 6LT Southend (0702) 230324
CG	Planet Software 10 Norton Drive Eaton Norwich	DB	Mick Bignell 01 953 8385
CH	Brighton Game 24 Gloucester Road Brighton Sussex 0273 698424	DC	Giltrole Ltd PO Box 50 Rugby Warks CV21 4DH
CI	Picturesque 6 Corkscrew Hill West Wickham Kent BR4 9BB	DD	Deep Thought Software 20 Chautauanger Alton Hants
CJ	7 Liddett Crescent Roundhay Leeds	DE	Silversoft 40 Empress Avenue Ilford Essex
CK	Chrisalid 13 High Street Berkinstad Herts 74569	DF	Michael Orwin 26 Brownlow Road Willesden London NW10
CL	MED 1736 Church Hill Road Thurmaston Leicester Leicester 704492	DG	Hisoft 60 Hallam Moor Liden Swindon Wiltshire
CM	Simple Software 15 Havelock Road Brighton Sussex 0273 504879	DH	The Soft Option Bamberplan Ltd PO Box 11 Cranbrook Kent 058080 310
CN	Buffer Micro Shop 374A Streatham High Road London SW16 769 2887	DJ	Microcomputer Spacedrome 3 Westholm London NW11 01 458 5845
CO	Pixel Productions 39 Ripley Gardens London W1 4HF	DK	Spider Software 98 Avondale Road Wouth Croydon Surrey 01 680 0267
CP	Computics Microsoft 1 Bell Lane Wheatley Oxford 0X9 1XY	DL	Xavier Business Systems 7 North Lane Clayton Scarborough Yorkshire (0723) 583509
CQ	KW Software 155 Ronginglow Road Sheffield S11 7PS	DM	Camden Electronics (Systems Division) 462 Coventry Road Small Heath Birmingham 021 773 8240/021 772 5718
CR	Sideline Freepost Oxford OX2 8BR	DN	Sumlock Electronic Services Royal London House 198 Deansgate Manchester M3 3NE
CS	IQ Services Canal House Ardrigshaig Argyll Scotland 0546 3212	DO	Microstyle 29 Belvedere Lansdowne Road Bath (0225) 334569
CT	Willow Software PO Box 6 Crediton Devon EX17 1DL	DP	Small Systems Engineering Ltd 2-4Canfield Place London NW6 01 328 7145
CU	Level 9 Computing 229 Hughenden Road High Wycombe Bucks	DQ	Woodland Software 103 Oxford Gardens W10 6NF 01 960 4877
CV	J Perves 12 Stobhill Road Gorebridge Midlothian EH23 4PL		

SOFTWARE LISTING

ATOM

Title	Program Type	Program Produced By	Memory Req'd	How Sold	Supplier Codes	Prices
Constellation	Gm	Program Power	12K	C GK		£7.99
Constellation	Gm	Program Power	12K	C GK		£7.99
Colour Invaders	Gm	Hopesoft	12K	C JV		£3.75
Cowboy Shootout	Gm	Program Power	12K	C CH,GK		£7.99
Cylon Attack	Gm	A&F S/W	12K	C GE		£4.95
Dambusters	Gm	Program Power	10K	C GK		£5.69
Data Base	Ut	Acornsoft	6K	C EJ,FZ,FA,GA		£11.50
Death Satellite	Gm	A&F S/W	12K	C GE		£6.00
Demon Dungeon	Gm	Program Power	5K	C GK		£6.85
Derby, Blitz and Rat Race	Gm	Program Power	12K	C GK		£6.84
Desk Diary	Bs	Acornsoft	12K	C FA,EJ,AL,GA		£11.50
Detective	Gm	Computersmith	12K	C IC		£4.95
Disassembler	Ut	Hopesoft	3K	C JV		£1.75
Disassemble Program	Ut	Program Power	4K	C GK		£6.85
Dragon's Lair	Gm	Program Power	12K	C GK		£6.85
Early Warning	Gm	A&F S/W	12K	C GE		£4.95
Earth Rescue	Gm	Rucksoft	6K	C HO		£2.80
Easy Talker	Ed	Acornsoft	16K	C AW		£5.00
Escape	Gm	A&F S/W	8K	C GE		£4.95
Fall of Rome	Gm	Program Power	12K	C GK		£7.99
Forth Tape	Ut	Acornsoft		C FA		POA
Forth, Theory & Practice	Bs	Acornsoft		C AL		£6.00
Fruit Machine	Gm	Bug Byte	8K	C HO		£4.00
Galactica	Gm	Program Power	12K	C GK		£5.69
Galaxian	Gm	Bug Byte	12K	C CH,GA,GB		£8.00
Galaxian War and Invasion	Gm	Program Power	2K	C GK		£6.84
Golf	Gm	Computersmith	12K	C IC		£4.95
Golf	Gm	Bug Byte	6K	C HO		£5.00
High Stats	Bs	Program Power	12K	C GK		£7.99
Hyper Fire	Gm	Program Power	12K	C GK		£9.15
Introductory Pack	Ed	Acornsoft	3K	C GA,FA,AL		£23.00
Invader Force	Gm	Program Power	12K	C GK		£9.15
Invaders	Gm	Bug Byte	12K	C CH,GA,GB		£8.00
Labyrinth	Gm	Bug Byte	12K	C HO		£6.95
Last Run	Gm	Bug Byte	7K	C HO		£3.00
Lunar Lander	Gm	Program Power	12K	C GK		£7.99
Martians	Gm	Program Power	12K	C GK		£7.99
Maths Pack 1:	Ed	Acornsoft	4K	C EJ,FA,FZ,AL,GA		£11.50
Maths Pack II:	Ed	Acornsoft	6K	C EJ,FA,FZ,AL,GA		£11.50
Maze Ball	Gm	Program Power	12K	C GK		£5.69
Microbudget	Bs	Program Power	12K	C GK		£9.15
Mine Field	Gm	A&F S/W	6K	C GE		£4.95
Missile Command	Gm	A&F S/W	12K	C GE		£4.95
Mode 4 VDU	Ut	Program Power	12K	C GK		£7.99
Moon Lander	Gm	Rucksoft	6K	C HO		£2.25
Munchy Man	Gm	Program Power	12K	C GK		£5.69
Music Box	Gm	Program Power	12K	C GK		£7.99
Parachute	Gm	Rucksoft	5K	C HO		£2.25
Peeko Computer	Ed	Acornsoft	6K	C GA,FA,AL		£11.50
Pinball	Gm	Bug Byte	6K	C HO		£4.50
Pirate Island	Gm	Hopesoft	12K	C JV		£6.75
Polaris	Gm	A&F S/W	12K	C GE		£3.95
Polecat	Gm	A&F S/W	12K	C GE		£4.95
Pontoon	Gm	A&F S/W	12K	C GE		£3.95
Programmer's Toolkit	Gm	Program Power		C GK		£28.15
Reversi	Gm	Program Power	8K	C GK		£5.69
Rhino and Wiggle	Gm	Bug Byte	10K	C HO		£5.00
Robot Control	Ed	Acornsoft	16K	C AW		£35.00
Robot Nim	Gm	A&F S/W	6K	C GE		£3.95
Sketch Pad Program	Gm	Program Power	5K	C GK		£5.69
Softscreen	Ut	Computer Concepts	12K	C GJ		£11.50
Space Invaders	Gm	Pro S/W	12K	C LD		£6.00
Space Fighter	Gm	Program Power	12K	C GK		£9.15
Space Invaders	Gm	Computer Concepts	12K	C GJ		£7.80
Space Adventure	Gm	Pro S/W	12K	C LD		£6.00
Space Storm	Gm	Program Power	4K	C GK		£5.69
Spirographics	Gm	Rucksoft	8K	C HO		£2.45
Star Raid	Gm	Rucksoft	11K	C HO		£3.30
Star Trek	Gm	Program Power	5K	C GK		£6.85
Star Trek	Gm	Bug Byte	12K	C HO		£5.00
Statistics Pack	Ut	Bug Byte	12K	C HO		£20.00
Stockbroker	Gm	Program Power	5K	C GK		£4.54
Super Race Track	Gm	Program Power	12K	C GK		£5.69

SOFTWARE DEALERS

DR	Telesystems Ltd PO Box 12 Great Missenden Bucks HP16 9DD	EK	Holly Products Blackthorn House Dukes Lane Gerrards Cross Bucks
DS	Macronics 26 Spiers Close Knowle Solihull West Midlands B93 9ES	EL	I G Systems 6 Laleham Avenue Mill Hill London NW7 01 959 0106
DT	Hewson Consultants 7 Graham Close Blewbury Oxon (0235) 850075	EM	Merton Electronics 85/87 Station Road W Croydon 68) 8606
DU	Silicon Office Servics 240 Durants Road Enfield Middx EN3 7AZ 01 805 0903	EN	DaVinci Computer Shop 65 High Street Edware Middlesex
DV	Siron Computer Systems Unit 14 29 Willow Lane Mitcham Surrey 01 640 6931	EO	Calco Software Lakeside House Kingstone Hill Surrey 01 546 7256
DW	Psion Ltd 2 Huntsworth Mews Gloucester Place NW1 6DD	EP	Richard Francis 22 Foxhollow Barhill Cambridge
DX	JRS Software 19 Wayside Avenue Worthing 65691 (evening and weekends only)	EQ	Microtek Ltd 15 Lower Brook Street Ipswich Suffolk (0473) 50512 or 52466
DY	Callisto Computers Ltd 119 John Bright Street Birmingham B1 1BE 021 632 6458	ER	Diskwise Ltd 25 Fore Street Callington Cornwall 05793 3780
DZ	Micro Gen 24 Agar Crescent Bracknell Berks 0344 27317	ES	Control Technology 39 Gloucester Road Gee Cross Hyde Cheshire SK14 5JG 061 368 7558
EA	Anglia Computer Centre 88 St. Benedicts Street Norwich NR2 4AB 0603 25002	ET	Comp Shop 311 Edgware Road London W2 01 262 0387
EB	SBD Software 15 Jocelyn Road Richmond TW9 2TJ 01 948 0461	EU	Micro Computer Products Cambridge House Cambridge Road Barking Essex IG11 8NT 01 591 6511
EC	Abacus Software PO Box 7211 Grand Rapids Michigan USA 49510	EV	GW Computers 55 Bedford Court Mansions Bedford Avenue London WC1 01 636 8210
ED	Qdos Business Software 9 Tintern Close Streety Birmingham 021 353 0058	EW	C/WP Computers 108 Rochester Row London SW1P 1JP 01 828 3127
EE	4K'tronics 23 Sussex Road Gorleston Great Yarmouth Norfolk (0493) 602453	EX	Metrotech Mail Order Waterloo Road Uxbridge Middx 0895 588111 x 274/269
EF	Computech Systems 168 Finchley Road Londos NW3 6HP 01 794 0202	EY	Microsystems Ltd Summerfield House Vale Guernsey 0481 473377
EG	Electronics Experts Avondale Workshops Woodland Way Kingswood Bristol BS15 1QH	EZ	Superior Systems Ltd 178 West Street S14ET 0742 755005
EH	Artic Computing 396 James Reckitt Avenue Hull HU8 0JA	FA	Control Universal Ltd Unit 2 Andersons Court Newnham Road Cambridge 0223 358757
EI	Knights TV & Computers 108 Rosemount Place Aberdeen 0224 630526	FB	Pete & Pam Computers 98 Moyser Road London SW16 01 677 2052/7341
EJ	Microage Electronics 135 Hale Lane Edgware Middx 01 959 7119	FC	Zenith Data Systems Bristol Road Gloucester 0452 29451

SOFTWARE DEALERS

Squares, Simon and Parachute	Gm	Bug Byte	7K	C HO	£5.00
Tangle	Gm	A&F S/W	6K	C GE	£3.95
The Soft VDU	Gm	Acornsoft	8K	C AY,FA,GA EJ,AL,CH,FZ	£11.50
The Park	Gm	Program Power	12K	C GK	£5.69
Time Tutor	Ed	A&F S/W	6K	C GK	£3.95
2K Programs (1)	Gm	Bug Byte	2K	C HO	£4.50
2K Programs (3)	Gm	Bug Byte	2K	C HO	£4.50
Typist	Ut	Bug Byte	6K	C HO	£4.00
Tunnel	Gm	Rucksoft	6K	C HO	£2.65
UFO Bomber	Gm	Bug Byte	7K	C HO	£4.00
Utility Pack 1	Ut	Acornsoft	2K	C FA,GA,AL,GA	£11.50
Warlords	Gm	Program Power	12K	C GK	£7.99
Word Pack ROM	Ut	Acornsoft	8K	C AJ,EJ,CA	POA
Word Processings Pack	Bs	Acornsoft	8K	C FA	POA
Word Tutor	Bs	Acornsoft	12K	C GA,EJ,FA,AL	£11.50
Write Your Own Adventure	Ut	Hopesoft	12K	C JV	£5.75
Yan	Gm	Program Power	3K	C GK	£5.69
Yellow Pearl	Gm	Rucksoft	7K	C HO	£3.30

TEXAS

3D O's and X's/Mastermind	Gm	Apex S/W	16K	C JT	£4.95
A-Maz-Ing	Gm	Texas	8K	R AB,CH	£24.00
Addition, Subtraction I	Ed	Texas	8K	R AB	£35.00
Addition, Subtraction II	Ed	Texas	8K	R AB	£35.00
Attack	Gm	Texas	8K	R AB	£30.00
Adventure Land	Gm	Texas	8K	C AB	£24.95
Battlefront	Gm	TX Software	16K	C JU	£6.00
Beginning Grammar	Ed	Texas	8K	R AB	£20.00
Blackjack Poker	Gm	Texas	8K	R AB	£24.00
Blasto	Gm	Texas	8K	R AB	£25.00
Car Wars	Gm	Texas	8K	R AB,CH	£25.00
Chequebook Manager	Bs	Texas Max	16K	D AB	£19.00
Chess File	Gm	TX Software	16K	C JU	£6.00
Connect 4	Gm	Texas	8K	R AB	£24.00
Early Reading	Ed	Texas	8K	R AB	£35.00
Editor Assembler	Ut	Texas	8K	R AB	£115.00
Electrical Eng'g Library	Bs	Texas Max	16K	C AB	£24.00
Electrical Eng'g Library	Bs	Texas Max	16K	D AB	£35.00
Extended Basic	Bs	Texas	8K	R AB	£100.00
Four in a Row	Gm	TX Software	16K	C JU	£6.00
Gamestape 1	Gm	Apex S/W	16K	C JT	£1.95
Gamestape 2	Gm	Apex S/W	16K	C JT	£3.95
Gamestape 3	Gm	Apex S/W	16K	C JT	£4.95
Ghost Town	Gm	Texas	8K	C AB	£24.95
Golden Voyage	Gm	Texas	8K	C AB	£24.95
Golf	Gm	TX Software	16K	C JU	£6.00
Graphing Package	Do	Texas Max	16K	C AB	£14.00
Graphing Package	Do	Texas Max	16K	D AB	£19.00
Hangman	Gm	Texas	8K	R AB	£24.00
Haunted House	Gm	Apex S/W	16K	C JT	£5.95
Household Money Management	Do	Texas	8K	R AB	£25.00
Hunt The Wumpus	Gm	Texas	8K	R AB,CH	£25.00
Hustle	Gm	Texas	8K	R AB	£30.00
Lunar Lander	Gm	Apex S/W	16K	C JT	£4.95
Mailing List	Bs	Texas Max	16K	D AB	£60.00
Market Simulation	Bs	Texas	32K	C AB	£9.00
Market Simulation	Bs	Texas	32K	D AB	£19.00
Maths Routine Library	Ed	Texas Max	16K	C AB	£24.00
Maths Routine Library	Ed	Texas Max	16K	D AB	£35.00
Maze/Towers of Hanoi	Gm	Apex S/W	16K	C JT	£5.95
Mind Challenges	Gm	Texas	16K	R CH	£24.95
Minimemory	Ut	Texas	8K	R AB	£89.95
Minimemory	Ut	Texas	8K	C C	£89.95
Mission Impossible	Gm	Texas	8K	C AB	£24.95
Multiplication	Ed	Texas	8K	R AB	£35.00
Munchman	Gm	Texas	8K	R AB	£29.95
Music Makers	Do	Texas	8K	R AB	£35.00
Music Maker	Ed	Texas	16K	D AB	£14.00
Music Skills Trainer	Ed	Texas Max	16K	C AB	£19.00
Music Skills Trainer	Ed	Texas Max	16K	D AB	£24.00
Mystery Funhouse	Gm	Texas	8K	C AB	£24.95
Nim/O's and X's	Gm	Apex S/W	16K	C JT	£4.95
Number Magic	Ed	Texas	8K	R AB	£18.00
Oldies but Goodies	Gm	Texas Max	16K	C AB	£9.00
Oldies but Goodies	Gm	Texas Max	16K	D AB	£14.00
Othello	Gm	Texas	8K	R AB	£40.00
Personal Financial Aid	Do	Texas	8K	C AB	£9.95

FD	Commodore Information 675 Ajax Avenue Slough Berks Slough 79292	FV	The Avery Computer Company 13 The Mall Bar Hill Cambridge (Crafts Hill 80991)
FE	Logic Computers 31 Palmer Street London SW1H 0PR 01 222 1122/5492	FW	Hilderbrey Ltd 8/10 Parkway Regents Park London NW1 01 485 1059
FF	Overseas Computer Systems Cons. 182a Queens Road Watford Watford 48580	FX	Micromedia Vine Cottage Tentelow Lane Norwood Green Middx 01843 9457
FG	Blyth Computers Wenhaston Halesworth Suffolk 050 270 565	FY	Wida Software 2 Nicholas Gardens London W5 5HY 01 567 6941
FH	Taurus Computer Design 47 High Street Baldock Herts SG7 6BG	FZ	Superior Systems Ltd 178 West Street Sheffield 0742 755005
FI	HITEC Zollgasse 15 A-1070 Vienna Austria 01043 222 934331	GA	Eltec Services Limited 231 Manningham Lane Bradford BD8 7HH (0274) 491372
FJ	Graffcom Systems 102 Portland Road Holland Park London W11 01 727 5561	GB	Anglo American Software 138a Stratford Court Sparkhill Birmingham 021 771 2995
FK	Electronic Aids Mythe Crest The Mythe Twekesbury Glos GL20 6EB 0386 831020	GC	Castle Electronics 15 Castle Street Hastings East Sussex 0424 437375
FL	BUG-BYTE 98-100 The Albany Old Hall Street Liverpool	GD	Quicksilva 95 Upper Brownhill Road Maybush Southampton Hants 0703 771248
FM	Learning Computer Systems 37 St Andrews Drive Seaford Sussex BN25 2SB	GE	A&F Software 10 Wilpshire Avenue Longsight Manchester 061 320 5482
FN	Jentech Services Ltd Nordley Bridgenorth Shropshire WV16 4SU 07462 5287	GF	SRS Microsystems 161 Bramley Road Oakwood London N14 4XA 01 363 8060
FO	Work Force 140 Wilsden Avenue Luton Beds LU1 5HR	GG	Stirling Microsystems 241 Baker Street NW1 01 486 7671
FP	Twickenham Computer Centre 72 Heath Road Twickenham Middx 892 7896 or 891 1612	GH	Microtan Software 234 Dulwich Road London OBD 01693 7659
FQ	Sbd Software 15 Jocelyn Road Richmond 948 0461	GI	Lander Microsystems 32 Clockhouse Lane Collier Row Romford Essex Romford 26325
FR	Beebug PO Box 50 St Albans Herts (Independent User Group for BBC Micro)	GJ	Computer Concepts 16 Wayside Chipperfield Herts 09277 62955
FS	RAM Computer Services Ltd 15-17 North Parade Bradford 0274 39116	GK	Program Power 5 Wensley Road Leeds LS7 2LX 0532 683186
FT	Ozwise Computers 28 Crofts Road Harrow Middx HA1 2PH 01 863 2309	GL	Syrtris Software 23 Quantock Road Bridgewater Somerset
FU	Compusense PO Box 169 Palmer's Green London N13 4HT 01 882 0681	GM	Lutterworth Software 6 Cromwell Close Walcote Lutterworth LE17 4JJ
		GN	Collins Computing The Gatehouse Whinburgh Dereham Norfolk

REFERENCE

SOFTWARE LISTING

TEXAS

Title	Program Type	Program Produced By	Memory Req'd	How Sold	Supplier Codes	Prices
Personal Record Keeping	Do	Texas	8K	R	AB	£50.00
Personal Report Generator	Do	Texas	8K	R	AB	£70.00
Physical Fitness	Do	Texas	8K	R	AB	£20.00
Pirate Adventure	Gm	Texas	8K	R	AB	£39.95
Pre-School Learning Fun	Ed	Texas	8K	R	AB	£17.00
Programming Aids I	Ut	Texas	16K	C	AB	£9.00
Programming Aids I	Ut	Texas	16K	D	AB	£14.00
Programming Aids II	Ut	Texas	16K	D	AB	£24.00
Programming Aids III	Ut	Texas	16K	D	AB	£19.00
Pyramid of Doom	Gm	Texas	8K	C	AB	£24.95
Roulette/Craps	Gm	Apex S/W	16K	C	FT	£4.95
Savage Island I	Gm	Texas	8K	C	AB	£29.95
Savage Island II	Gm	Texas	8K	C	AB	£29.95
Saturday Night Bingo	Gm	Texas Max	16k	C	AB	£14.00
Soccer	Gm	Texas	8K	R	AB,CH	£30.00
Sorcerers Castle	Gm	Apex S/W	16K	C	FT	£5.95
Speech Editor	Ut	Texas	8K	R	AB	£35.00
Statistics	Do	Texas	8K	R	AB	£45.00
Strange Odyssey	Gm	Texas	8K	C	AB	£24.95
Structural Eng'g Library	Bs	Texas	16	C	AB	£24.00
Structural Eng'g Library	Bs	Texas Max	16K	D	AB	£35.00
TI Logo	Ut	Texas	48K	R	AB	£160.00
TI Invaders	Gm	Texas	8K	R	AB,CH	£40.00
TI Trek	Gm	Texas Max	16K	D	AB	£14.00
Teach Yourself Extended Basic	Ed	Texas	32K	C	AB	£20.00
Teach Yourself Extended Basic	Ed	Texas	32K	D	AB	£29.00
Teach Yourself Basic	Ed	Texas	32K	C	AB	£30.00
Teach Yourself Basic	Ed	Texas	32K	D	AB	£40.00
Terminal Emulator	Ut	Texas	8K	R	AB	£57.00
The Count	Gm	Texas	8K	C	AB	£24.95
Tombstone City	Gm	Texas	8K	R	AB,CH	£40.00
Tunnels of Doom	Gm	Texas	8K	R	AB,CH	£40.00
UCSD PASCAL 4	Ut	Texas	48K	D	AB	£380.00
US Football	Gm	Texas	8K	R	AB	£24.00
Video Chess	Gm	Texas	8K	R	AB,CH	£50.00
Video Games I	Gm	Texas	8K	R	AB,CH	£25.00
Video Games II	Gm	Texas	8K	R	AB	£25.00
Voodoo Castle	Gm	Texas	8K	C	AB	£24.95
Yahtzee	Gm	Texas	8K	R	AB	£30.00
Zero Zap	Gm	Texas	8K	R	AB	£24.00

ZX SPECTRUM

3D Mazenture	Gm	Softek	48K	C	OK	£3.95
3D Tanx	Gm	dK'tronics	16/48K	C	EE	£4.95
3D Tunnel	Gm	New Generation	16/48K	C	OM	£4.95
Adventure	Gm	Foilkade	16/48K	C	ON	£5.95
Adventure	Gm	Abersoft	48K	C	HX	£9.95
Adventure 1	Gm	D J Moody	16K	C	OO	£5.00
Adventure 2	Gm	D J Moody	16K	C	OO	£5.00
Adventure 3	Gm	D J Moody	16K	C	OO	£5.00
Adventure 4	Gm	D J Moody	16K	C	OO	£5.00
Adventure Quest	Gm	Level 9	48K	C	CU	£9.90
Airline	Gm	Cases Computer Simulations	16K	C	KZ	£5.00
Alien	Gm	Spectra Soft	16K	C	JJ	£3.95
Alien Command	Gm	Microware	16K	C	OP	£4.75
Angles	Ed	AVC Software	16K	C	M	£3.00
Arcade Pack 1	Gm	Ohmega Electronics	16K	C	IO	£4.82
Arcadia	Gm	Imagine Software	16/48K	C	OR	£5.50
Aspect Assembler	Ur	Bug-Byte	16/48K	C	FL	£9.00
Assembler	Ur	Artic	16K	C	EH	£9.95
Assembler/Disassembler	Ur	Hewson	16/48K	C	DT	£8.95
Associative Database System	Do	Docimodus	16K	C	HE	£15.00
Asteroids	Gm	Abbe Electronics	16K	C	OT	£5.95
Astro Scramble	Gm	C Tech	16/48K	C	OU	£2.95
Atoms	Gm	Cornhill	16K	C	JK	£5.50
Audio Sonics	Ur	Work Force	16/48K	C	FO	£4.99
Autochef	Do	Cases Computer Simulations	16K	C	KZ	£5.00
Avenger	Gm	Abacus Electronics	16K	C	OS	£4.95
Awari	Gm	Foilkade	16/48K	C	ON	£5.95
Backgammon	Gm	Microware	16K	C	OP	£5.00
Battle Of Britain	Gm	MS	48K	C	OW	£5.95
Bermuda Triangle	Gm	Kricon Ltd	48K	C	QK	£9.75

SOFTWARE DEALERS

GO	Datafax Riviera House Queens Road Buckhurst Hill Essex	HH	J K Greye Software 16 Park Street Bath Avon BA1 2TE
GP	C C Soft 83 Longfield Street Soutfields London SW18	HI	John Prince 29 Brook Avenue Levenshire Manchester M19
GQ	Microx 52 The Strand Worthing Sussex Worthing 49584	HJ	Titan Programs 83 Ashwood Road Rudloe Corsham Wiltshire SN13 0LG (0225) 810132
GR	Pro Software 121 Tyn-Y-Twr Baglan Port Talbot West Glamorgan SA12 8YE	HK	Micro Computer Software Unit D6 Pear Industrial Estate Stockport Road Lower Bredbury Stockport SK6 2BP 061 494 2441
GS	Sussex Software Wallsend House Pevensy Bay East Sussex	HL	Phipps Associates 99 East Street Epsom Surrey KT17 1EA
GT	Rose Cassettes 148 Widney Lane Solihull West Midlands B91 3LH	HM	Gemini Electronics 50 Newton Street Manchester M1 061 236 3083
GU	Axis 71 Brocfield Avenue Loughborough Leics LE11 3LN	HN	The Vic Centre 154 Victoria Road Acton London W3 6UL 01-992-9904
GV	PR Software 28 The Fairway South Ruislip Middx HA4 0RY	HP	R & R Software 34 Bourton Road Gloucester GL4 0LE 0452-502819
GW	Bridge Software 36 Fernwood Marple Bridge Stockport Cheshire SK6 SBE	HQ	Town Book & Toys 15 Eastgate Street Gloucester Glos
GX	Video Software Limited Stone Lane Kinver Stourbridge West Midlands Kinver 2462	HR	Screen Scene 144 St Georges Road Cheltenham Glos
GY	J M Steadman 6 Carro Close Leightor Buzzard Beds LU7 7XB	HS	Software Masters Ltd 30 Lincoln Road Olton Birmingham
GZ	Transform Ltd 41 Keats House Porchester Mead Beckenham Kent 01 658 1661	HT	John Prince Software 29 Brook Avenue Levenshulme Manchester M19
HA	Baust Computing Consultants 31 Peak Lane Fareham Hants PO14 1RX 0329 281480	HU	Nick Godwin 4 Hurkur Crescent Eymouth Berkshire TD14 5AP
HB	University Computers 5 St Barnabas Road Cambridge CB1 2BU	HV	A Parsons 23 Coxhill Gardens Rivers Dover Kent
HC	Educare 139a Sloane Street London SW1X 9AY	HW	Bryants (Educational) Software 1 The Hollies Chalcraft Lane North Berstead Bognor Regis West Sussex PO21 55X
HD	Simon Software Freepost New End Redditch	HX	Abersoft 7 Maes Afallen Bow Street Dyled SY24 5BA
HE	Docimodus 161 Walmersley Road Bury Lancashire BL9 5DE	HY	D.C. Roberts 107a Royal George Road Burgess Hill Sussex
HF	M C Associates 4 Granby Road Cheadle Hulme Cheshire SK8 6LS	HZ	Hard & Soft 85 Snowdown Avenue Hillingdon Middx UB10 0SE
HG	Addictive Games PO Box 278 Conniburrow Milton Keynes MK14 7NE		

SOFTWARE DEALERS

Bit, Byte Rotation	Ut	Cornhill	16K	C JK	£4.50
Biorhythms	Do	ICL	16K	C OX	£6.95
Black Crystal	Gm	Carnell Software	48K	C OY	£7.50
Bridge	Gm	ZX SAS	16K	C OV	£6.50
Bomber	Gm	Llamasoft	16K	C KG	£2.95
Business Bank Account	Bg	Transform	16K	C GZ	£8.75
Business Model Modeller X	Bg	Cases Computer Simulations	16K	C KZ	£8.00
Business Pack	Bg	Transform	16K	C GZ	£25.00
Breaker	Gm	Wizard	48K	C PA	£3.50
Cabman	Gra	Micro Power	16K	C OZ	£3.95
Centipede	Gra	dK'tronics	16/48K	C EE	£4.95
Chess	Gm	Artic	48K	C EH	£9.45
City	Gra	Docimodus	48K	C HE	£8.00
Club Record Collector	Do	ICL	48K	C OX	£9.95
Collector's Pack	Do	ICL	48K	C OX	£9.95
Colossal Adventure	Gra	Level 9	48K	C CU	£9.90
Commercial Accounts	Do	Gemini	16/48K	C PB	£19.95
Compiler	Ut	Softek	48K	C PC	£14.95
Compufile	Do	Jaysoft	16/48K	C PD	£4.95
Conflict	Gra	Martech Games	48K	C PE	£9.50
Cosmos	Gra	Abxex Electronics	16K	C OT	£4.95
Count-down	Ed	AVC Software	16K	C IM	£3.00
Crevasse/Hotfoot	Gra	Microsphere	16K	C PF	£4.95
Dallas	Gm	Cases Computer Simulations	16K	C KZ	£5.00
Database	Do	Buffer	16K	C CN	£4.50
Data Base	Ut	Gemini	16/48K	C PB	£19.95
Derby Day	Gm	Computer Rentals	48K	C PG	£5.95
Digital X-Word Compiler	Gm	N Darwood	16K	C JB	£6.00
Dragon Adventure	Gra	Level 9	48K	C CU	£9.90
Editor/Assembler	Ut	Picturesque	16/48K	C PH	£8.50
Educational Quiz	Ed	Rose Cassettes	48K	C GT	£4.50
Electronics	Ed	Spectre	48K	C PJ	£5.95
English Literature	Ed	ICL	16K	C OX	£6.95
Escape	Gm	New Generation S/W	16K	C OM	£4.95
Espionage Island	Gm	Artic	48K	C EH	£6.95
ETX	Gm	Abxex Electronics	16K	C OT	£5.95
Everest Ascent	Gm	Richard Shepherd	16/48K	C PK	£6.50
Evolution	Gm	Microsphere	48K	C PF	£6.95
Faust's Folly	Gm	Abxex Electronics	16K	C OT	£5.95
Figaro II	Do	Saxon	48K	C PL	£14.95
Football Manager	Gm	Addictive Games	48K	C PM	£7.95
Football Pools	Gm	Hartland	48K	C PN	£5.95
Fortune	Do	AVC Software	16K	C IM	£3.00
French	Ed	AVC Software	16K	C IM	£3.00
Frog/Showdown	Gm	Artic	16/48K	C EH	£4.95
Frogger	Gm	A&P Software	48K	C GE	£7.00
Fruita	Gm	Wizard	48K	C PA	£6.50
Galaxian	Gra	Artic	16K	C EH	£3.95
Galaxy Conflict	Gra	Martech Games	48K	C PE	£9.50
Galleons	Gra	Wizard	48K	C PA	£5.00
Game of Logic	Ed	N Darwood	16K	C JB	£8.00
Games 4	Gm	ICL	16K	C OX	£4.95
Games Pack 1	Gm	Abacus Electronics	16K	C OS	£4.95
Geography 1	Ed	ICL	16K	C OX	£6.95
Gobblerman	Gm	Artic	16K	C EH	£3.95
Gold	Gm	Hilderbay	48K	C FW	£8.00
Golf	Gm	R&R Software	16K	C HP	£3.75
Gorfian	Gm	C Tech	16/48K	C PO	£5.00
Grail	Gm	Severn Software	16/48K	C PP	£4.95
Graph	Ed	AVC Software	16K	C IM	£3.00
Graph	Ut	Spectre Soft	16K	C JJ	£4.95
Graphics Creator	Ut	Llamasoft	16K	C RG	£2.95
Great Britain Ltd	Gm	S W Hessel	48K	C IW	£14.39
Ground Attack	Gm	Silversoft	16/48K	C DE	£5.95
Ground Force Zero	Gm	Titan	16/48K	C HJ	£5.00
Gulpman	Gm	Cambell Systems	16K	C PR	£5.95
Hangman	Gm	Spectre Soft	16K	C JJ	£4.95
Hangperson	Ed	AVC Software	16K	C IM	£3.00
Harrier	Gm	Abxex Electronics	16K	C OT	£5.95
Headbanger	Gm	Llamasoft	48K	C KG	£4.95
High Noon	Gm	Abxex Electronics	16K	C OT	£5.95
History 1	Ed	ICL	16K	C OX	£6.95
Home Accounts	Do	Gemini	16/48K	C PB	£19.95
Horace Goes Sking	Gm	Pision	16/48K	C DW	£5.95
Hungry Horace	Gm	Pision	16/48K	C DW	£5.95
Inca Curse	Gm	Artic	48K	C EH	£6.95
Income Tax	Do	ZX SAS	16/48K	C OV	£6.50
Index/Retrieval System	Do	ZX SAS	16/48K	C OV	£4.50
Infrared	Ut	ACS Software	16/48K	C PS	£6.75
Inheritance	Gm	S W Hessel S/W	48K	C IW	£5.95
Intermediate English 1	Ed	Rose Cassettes	16K	C GT	£4.50
Intermediate English 2	Ed	Rose Cassettes	48K	C GT	£4.50
Intermediate Maths 1	Ed	Rose Cassettes	48K	C GT	£4.50
Intermediate Maths 2	Ed	Rose Cassettes	48K	C GT	£4.50
Invaders	Gm	Artic	16/48K	C EH	£4.95
Invasion	Gm	Abxex Electronics	16K	C OT	£5.95
Inventions 1	Ed	ICL	16K	C OX	£6.95

IA	Microdeal Deal House Luxulyan Bodmin Cornwall PL30 5E 0726-850-821	IS	Microcomputer Applications 41 Queens Road Blandford Forum Dorset DT11 7LA
IB	Aztec Software 25 St Mark Road Deepcar Sheffield S30 5TS	IT	I.J.K. Software 55 Fitzroy Road Bisphan Blackpool Lancs
IC	Orgre Games & Software Fantasy Department 47 Chislehurst Avenue Liverpool 25 Merseyside	IU	Aardvark Software 15 Queensbury Avenue Hartlepool Cleveland TS26 9NW
ID	Tridata Micro's Ltd Smithfield House Digbeth Birmingham B5 6BS 021-662 6085/6	IV	James Hager 7 Basset Street Cambourne Cornwall
IE	Plympton Computer Services 5 Turnbill Gardens Plympton Plymouth Devon PL7 3XF 0752-330176	IW	Simon Hessel Software 15 Lytham Court Cardwell Crescent Sunninghill Berkshire
IF	Electronics Applied 4 Dromore Road Carrickfergus Co Antrim BT38 7PJ	IX	Mayday Software 181 Portland Crescent Stanmore Middx HA7 1LR
IG	Emjay 17 Langbank Avenue Rise Park Nottingham NG5 5BU	IY	Persoft Freepost Baildon Shipley West-Yorkshire BD17 6EQ
IH	Kansas City Systems Unit 3 Sutton Springs Wood Chesterfield 0246-850357	IZ	Micro-Aid 25 Fore Street Praze-An-Beeble Cambourne Cornwall TR14 0JX
II	Serious Software 7 Woodside Road Bickley Bromley Kent BR1 2ES	JA	Hexagon Software 17 Cambridge Green Orley
IJ	Computercat 224 Chapel Street Leigh Lancashire WN7 2DW 0942-605730	JB	N. Darwood Ltd Halfacres Stroud PETERSFIELD Hampshire
IK	Silica Shop 1-4 The Mews Hatherly Road Sidcup Kent DA14 4DX	JC	Futura Software 63 Lady Lane Chelmsford Essex CM2 0TQ
IL	V & H Computer Services 182c Kingston Road Staines Middx	JD	Ultra-Tec Services 30a Billing Road Northampton NN1 5AZ
IM	AVC Software PO Box 415 Harborne Birmingham B17 9TT	JE	9 Franklin Road Saltcoats Ayrshire KA 21 5AT
IN	Computator 3 Thalia Close Greenwich SE10 4NA	JF	Gary Smith 'Brynllwyd' Capel Seion Aberystwyth Dyfed
IO	Omega Electronics 37 Chichester Square Carrickfergus Co Antrim BT38 8JU	JG	Aquarius Software 53 Towncourt Crescent Potts Wood Kent BR5 1PH
IP	A.V.O. Software Distribution 131 Lord Street Hoddesdon Hertfordshire EN11 8NG	JH	Precision Software Engineering 20 Shelton Avenue Newark Notts NG24 4NX
IQ	Big Softie 5 Aston Park Finaghy Belfast BT10 0JQ	JI	Spectre Soft Dunelm Cottage Maltmans Lane Gerrards Cross SL9 8RS
IR	Adamsoft 18 Norwich Avenue Rochdale Lancs OL11 5JZ	JK	Cornhill Services 2 Penrith Way Aylesbury Bucks HP21 7JZ
		JM	Morris Associates (Computing) 37 St Catherines Road Baglan Port Talbot SA12 8AT

SOFTWARE LISTING

ZX SPECTRUM

Title	Program Type	Program Produced By	Memory Required	How Sold	Supplier Codes	Prices
Jackpot	Gm	Computer Rentals	48K	C	PG	£5.95
Jackpot Fruit Machine/ Submarine Attack	Gm	Richard Shepperd	48K	C	PK	£4.95
Junior Education	Ed	Calpac	16/48K	C	KL	£5.50
KRAKIT	Gm	Artic	16K	C	EH	£9.95
Krazy Kong/Panic Island	Gm	C Tech	16/48K	C	PO	£5.00
L-Game	Gm	Quicksilva	16K	C	GD	£3.95
Learning	Ed	AVC Software	16K	C	IM	£3.00
Machine Code Test Tool	Ut	Oxford Computer Publishing	16/ 48K	C	PI	£9.95 £3.50
Magic Cards	Gm	Cornhill	16K	C	JK	£19.95
Mailing List	Do	Gemini	16/48K	C	PB	£6.95
Masterchess	Gm	Mikro Gen	48K	C	PQ	£15.00
Masterfile	Do	Cambell Systems	48K	C	PR	£8.00
Maths	Ed	ZX SAS	16/48K	C	OV	£4.95
Mazing	Gm	Spectre Soft	16K	C	JJ	£4.95
Mazeman	Gm	Abersoft	16K	C	HX	£4.95
Meteor Storm	Gm	Quicksilva	16K	C	GD	£4.95
Meteroids	Gm	Softek	16/48K	C	OK	£4.95
Meteroids	Gm	dK'tronics	16/48K	C	EE	£4.95
Mined-out	Gm	Quicksilva	48K	C	DG	£5.95
Mines of Moria	Gm	Severn Software	48K	C	PP	
Mines of Saturn/Return To Earth	Gm	Saturn Developments	16/ 48K	C	PU	£7.50
Monitor	Ut	Picturesque	16/48K	C	PH	£7.50
Monitor and Disassemblies	Ut	Crystal Computing	16/48K	C	PV	£8.95
Mortgage	Do	ZX SAS	16/48K	C	OV	£5.00
Multi Function Cash Controller	Do	Richard Shepherd	48K	C	PK	£10.00
Muncher	Gm	Silversoft	16/48K	C	PE	£5.95
Music 1	Do	ICL	16K	C	OX	£6.95
Namitar Raiders	Gm	Artic	16K	C	EH	£3.95
Night Flight	Gm	Hewson	16/48K	C	DT	£5.95
Numerics	Ed	Spectre	48K	C	PJ	£5.95
O-Level Chemistry	Ed	Calpac	48K	C	KL	£5.50
Omnicalc	Do	Microsphere	48K	C	PF	£9.95
Oro	Gm	Impact Software	48K	C	PW	£5.00
Orbiter	Gm	Silversoft	16/48K	C	PE	£5.95
Over The Spectrum No. 1	G/U	Melborne House	16K	C	PX	£5.95
Over the Spectrum No. 2	G/U	Melborne House	16K	C	PX	£5.95
Parity	Ed	N Darwood	16K	C	JB	£6.00
Pascal 4	Ut	Hisoft	48K	C	PY	£25
Pastimes 2	Gm	ICL	16K	C	OX	£4.95
Payroll	Bg	Hilderbay	48K	C	FW	£25
Penetrator	Gm	Melbourne House	48K	C	PX	£6.95
Personal Accounting Utility Ledger	Do	Jaysoft	48K	C	PD	£8.95
Personal Banking System	Do	Hilton	48K	C	PZ	£9.95
Phantasmagraphics	Do	Saxon	16/48K	C	PL	£6.95
Pharaoh's Tomb	Gm	Software For All	48K	C	KN	£6.95
Physprob	Ed	AVC Software	16K	C	IM	£3.00
Pilot	Gm	Hewson	16K	C	DT	£5.95
Pimania	Gm	Automats	48K	C	QA	£10.00
Planet Of Death	Gm	Artic	16/48K	C	EH	£6.95
Pools	Gm	Kricon Ltd	16K	C	QK	£4.95
Primary Arithmetic	Ed	Ross Cassettes	48K	C	GT	£4.50
Print Shot	Gm	Cases Computer Simulations	16K	C	KZ	£5.00
Programmer's Dream	Ut	Work Force	16/48K	C	QB	£6.99
Programmer's Toolkit	Ut	JRS Software	16/14K	C	DX	£5.95
Programs From Spectrum Machine Language Book	G/U	Melbourne House	16K	C	PX	£5.95
Purchase Day Book	Bg	Transform	16/48K	C	QC	£8.75
Purchase Ledger	Do	ZX SAS	16/48K	C	OV	£10.00
Quarterly Analysis	Bg	Transform	16/48K	C	QC	£4.75
Remember Delete	Ut	Work Force	16/48K	C	QB	£4.75
Rescue	Gm	Computer Rentals	48K	C	PG	£5.95
Retail Accounting	Do	ZX SAS	16/48K	C	OV	£10.00
Reversi	Gm	Sinclair Research	16K	C	BO	£7.95
Reversi	Gm	Spectre Soft	16K	C	JJ	£4.95
Roman Empire	Gm	M C Lothiorian	16/48K	C	QD	£5.50
Rox III	Do	Llamosoft	16K	C	KG	£2.95
Sales Day Book	Bg	Transform	16/48K	C	QC	£8.75
Sales Ledger	Do	ZX SAS	16/48K	C	OV	£10.00
Samurai Warriors	Gm	M C Lothiorian	16/48K	C	QD	£5.50
Schizoids	Gm	Imagine Software	16/48K	C	OR	£5.50
Scramble	Gm	Work Force	16/48K	C	QB	£4.95
Scramble	Gm	Mikro Gen	16/48K	C	PQ	£5.50
Shaken But Not Stirred	Gm	Richard Shepherd	48K	C	PK	£6.50
Ship Of Doom	Gm	Artic	48K	C	EH	£6.95
Ship Of The Line	Gm	Richard Shephard	16/48K	C	PK	£6.50
Snackman	Gm	Amba Software	16K	C	QE	£4.95

SOFTWARE DEALERS

JN	Terminal Software 28 Church Lane Prestwich Manchester M25 5AJ	KF	Chromasoft
JO	Mossoft Microcomputer Software 10 Garden Street Norwich Norfolk NR1 1QX	KH	Llamosoft Computer Software 49 Mount Pleasant Tadley Hants 07356-4478
JP	Romik 24 Church Street Slough SL1 1PP	KH	Superior Software 69 Leeds Road Bramhope Leeds 0532-842714
JQ	David Computer Software 38 South Parade Bramhall Stockport SK7 3BJ	KI	Earthshock Software 15 Eden Avenue Wakefield WF2 9DJ
JR	Creative Software 48 Hartip Hill Newington Sittingbourne Kent ME9 7NZ	KJ	Bridge Software 36 Fernwood Marple Bridge Stockport Cheshire SK6 5BE
JS	Allrian Data Services 100a Usbridge Road Hayes Middx UB4 0RL	KK	ME & P Micro Products The Old East House Malting Lane Cambridge CB3 9HF
JT	Apex Trading Ltd 115 Crescent Drive South Brighton BN2 6SB	KL	Calpac Computer Software 108 Hermitage Woods Crescent St Johns Woking Surrey GU21 1UF
JU	TX Software 109 Abbotsweld Harlow Essex CM18 6TQ	KM	KCET Software 17 Torry Drive Ave 0259 60840
JV	Hopesoft Hope Cottage Winterbourne Newbury Berks RG16 8BB	KN	Software for All 72 North Street Romford 0788-60725
JW	GT Software 8 Bull Street Potton Sandy Bedfordshire SG19 2NR	KO	Rucksoft 10 The Moorlands Hanley Road Malvern Wells Worcestershire WR14 4PS
JX	Garland Computing 35 Dean Hill Plymouth PL9 9AF	KP	Liverpool Computer Centre
JY	Corona Software Corona House 21 Tennyson Avenue London E11 2QN	KQ	W. E. Hunt
JZ	MP Software & Services 165 Spital road Bromborough Merseyside L62 2AE	KR	ABC Software
KA	Ludinski Computer-Assisted Learning 26 Avondale Avenue Staines Middlesex 0784-58771	KS	Rainbow Software
KB	B.B.C. Publications The British Broadcasting Corporation 35 Marylebone High Street London W1M 4AA	KT	Chalksoft Lowmoor Cottage Toadale Wellington Somerset TA2 0AL
KC	Miking Software 28 New Road Northbourne Bournemouth Dorset BH10 7DS	KU	Wizard Software
KD	Inverse 'Orchard View' Droitwich Road Fernhill Heath Worcester WR3 7T2	KV	Data Brain Software
KE	Alan Turnbull 65 Vicarage Road Cale Green Stockport Cheshire	KW	NCG Ltd, Lettergesh Reavyle, Co Galway Republic of Ireland
		KX	Broadwater Economic Simulations 24 Hill Barn Lane Worthing West Sussex
		KY	Keat Computer Company Alders of Bromley High Street Bromley Keat
		KZ	Cases Computer Simulations 14 Langton Way Blackheath London SE3 7TL
		LA	Juniper Computing 8 Pembroke Green Lea Malmesbury Wiltshire SN16 9PB
		LC	Computersmith 40 Greensfields Avenue Bromborough Wirral Merseyside L62 6DD

SOFTWARE DEALERS

Softtime	Do	Softek	16/48K	C	PC	£3.95
Sorcerer's Castle	Gm	Mikro Gen	48K	C	PQ	£5.50
Space Intruders	Gm	Quicksilva	16K	C	GD	£4.95
Space Raiders	Gm	Psion	16/48K	C	DW	£4.95
SPDE	Do	Cambell Systems	16K	C	PR	£5.95
Speakeasy	Ut	Quicksilva	48K	C	GD	£4.95
Spec Bug	Ut	Artic	16/48K	C	EH	£6.95
Spectral Invaders	Gm	Bug Byte	16K	C	FL	£5.00
Spectrec	Gm	Palantir	48K	C	QF	£5.00
Spectres	Gm	Bug-Byte	16/48K	C	FL	£8.00
Spectrum Games	Gm	JRS Software	16K	C	DX	£4.95
Spectrum Zap						
ZX Reactor	Gm	ASP Software	16K	C	OD	£8.50
Specksound	Do	PDQ Software	16K	C	QG	£5.95
Spookymon	Gm	Abbox Electronics	16K	C	OT	£4.95
Starfighter	Gm	Impact Software	16K	C	PW	£5.00
Starship Enterprise	Gm	Silversoft	48K	C	DE	£5.95
Startrek	Gm	Gemini Software	48K	C	PB	£5.95
Star Trek	Gm	Fuller Micro	16K	C	QH	£5.50
Star Trek	Gm	Impact Software	16K	C	PW	£5.00
Star Trek	Gm	R&R Software	48K	C	HD	£4.95
Statisties	Do	Severn Software	16/48K	C	PP	£6.95
Stock Control	Do	Gemini	16/48K	C	PB	£19.95
Stock Control	Do	Hilderbay	48K	C	FW	£25
Storm-Fighters	Gm	John Prince	16/48K	C	HI	£4.95
Sub Track	Gm	Amba Software	16K	C	QE	£4.95
Superdeflex	Do	Llamosoft	48K	C	KG	£4.95
Super Gloop/Frogs	Gm	Sinclair Research	16K	C	BO	£4.95
Superpack 1	Do	Video Software	48K	C	QI	£7.00
Superplan	Do	Video Software	48K	C	QI	£12.00
Tables	Ed	AVC Software	16K	C	IM	£3.00
Taipen	Gm	Jaysoft	16/48K	C	PD	£4.95
Tasword	Do	Tasman	48K	C	QJ	£7.95
The Chess Player	Gm	Quicksilva	48K	C	GD	£6.95
The Hobbit	Gm	Melbourne House	48K	C	PX	£14.95
The Orb	Gm	Computer Rentals	48K	C	PG	£4.95
The Quest	Gm	Impact Software	48K	C	PW	£5.00
The Valley	Gm	ASP Software	48K	C	OD	£11.45
The Zolan Adventure	Gm	Softek	16K	C	PC	£4.95
Thro' the wall/Scramble	Gm	Sinclair Research	16K	C	BO	£4.95
Time-Gate	Gm	Quicksilva	48K	C	GD	£6.95
Toolkit	Ut	Sinclair Research	16K	C	BO	£5.95
Transylvanian Tower	Gm	Richard Shepherd	48K	C	PK	£6.50
Treasure Hunt	Gm	Amba Software	16K	C	QE	£4.95
Triplet	Gm	Wizard	48K	C	PA	£5.50
Turtle	Ed	AVC Software	16K	C	IM	£3.00
Tyrant of Athens	Gm	M C Lothlorian	16/48K	C	QD	£5.50
Ultraviolet	Ut	ACS Software	16/48K	C	PS	£7.50
User-Defined Graphics	Ut	Cornhill	16K	C	JK	£1.50
Video Pack	Do	C Tech	16/48K	C	OU	£5.00
Vu 3-D	Do	Sinclair Research	48K	C	BO	£9.95
Viewpoint	Ut	ACS Software	16/48K	C	PS	£6.50
Voice Chess	Gm	Artic	16/48K	C	EH	£9.95
Vu-Calc	Do	Psion	16/48K	C	DW	£8.95
Winged Avenger	Gm	Work Force	16K	C	QB	£4.50
Wordprocess	Bz	Spectre Soft	16K	C	JJ	£4.95
Zeus Assembler	Ut	Crystal Computing	48K	C	PV	£8.95
ZX Forth	Ut	Artic	48K	C	EH	£29.95
ZX Games 1	Gm	ASP Software	16K	C	OD	£5.99
ZX Sideprint	Ut	Microsphere	16K	C	PF	£4.95
ZX Utility 1	Ut	ASP Software	48K	C	OD	£5.99

ZX81

1K Chess	Gm	Artic	1K	C	EH	£2.95
1K Fun Learning	Ed	A.Parsons	1K	C	HV	£3.95
1K Games Pack	Gm	Artic	1K	C	BT,EH	£6.00
1K Maths	Ed	Mr Purves	1K	C	CV	£3.50
1K Super Trio	Gm	Software Masters	1K	C	AO	£7.95
16K Fun Learning	Ed	A.Parsons	16K	C	HV	£4.95
16K Games	Gm	Serious S/W	16K	C	HV	£5.95
16K Maths	Ed	Mr Purves	16K	C	CV	£3.50
3-D Labyrinth	Gm	dK'tronics	16K	C	EE	£3.95
3-D Monster Maze	Gm	J K Grege	16K	C	CN	£4.95
Adventure	Gm	Anglo American	16K	C	GB	£6.00
Adventure A	Gm	Artic	16K	C	EH,ET,CN	£6.00
Adventure B	Gm	Artic	16K	C	EH,ET,CN	£7.00
Adventure C	Gm	Artic	16K	C	EH,ET,CN	£8.00
Adventure I	Gm	Abbersoft	16K	C	CN	£9.95
Angle	Ed	AVC Software	16K	C	IM	£3.00
Adventure	Gm	Abbersoft	16K	C	CN,IX	£8.95
Action Games	Gm	A.Parsons	16K	C	HV	£4.95
Aladdin	Ed	Bryants S/W	16K	C	HW	£1.87
Arithmetic Teasers	Ed	Hard & Soft	3K	C	HZ	£3.95
Around Europe in 80hrs	Gm	S W Hessel	16K	C	CN	£4.25
Assembler	Ut	Artic	16K	C	EH	£6.95
Art & Fun	Gm	A.Parsons	16K	C	HV	£4.95
Asset Stripper	Gm	Micro Games	16K	C	CN	£4.50
Asteroids	Gm	Quicksilva	16K	C	CN	£5.50
Atoms	Ed	AVC Software	16K	C	IM	£3.00
Astro Invaders	Gm	John Prince S/W	16K	C	HT	£3.65

LD	Pro Software	121 Tyn-y-Twr Baglan Port Talbot West Glamorgan SA12 8YE
LE	Sumlock Electronic Services (M/cr) Ltd	Royal London House 198 Deansgate Manchester M3 3NE 061-834 4233
LF	Mavac Enterprises	101a Underdale Road Monkmoor Shrewsbury Shropshire SY2 5EF
LG	Sospan Soft	1 Warborough Close Old Road Ilanelli Dyfed
NP	Program Direct	
NR	Foilkade	
NT	Digital Fantasia	
NU	Database Software	
NV	CJE Microcomputers	
NW	Eduquest	
NX	Davansoft	
NY	Square Software	
NZ	Salamander Software	27 Ditchling Rise Brighton East Sussex BN1 4QL
PA	Wizard Software	PO Box 23 Dunfermline Fife KY11 5RW
PB	Gemini Software	36 Badminton Road Leicester LE4 7RO
PC	Softek	329 Croxted Road London SE24
PD	Jaysoft	22 Dane Acres Bishop's Stortford Herts
PE	Martech Games	9 Dillingborough Road Eastbourne East Sussex BN20 8LY
PF	Microsphere Computer Services	72 Roseberry Road London N10
PG	Computer Rentals Ltd	140 Whitechapel Road London E1
PH	Picturesque	6 Corkscrew Hill West Wickham Kent BR4 9BB
PJ	Spectre	2 Mull Close Oakley Basingstoke Hants
PK	Richard Shepard Software	Freepost Maidenhead Berks SL6 5BY
PL	Saxon Computing	3 St Catherines Drive Leconfield Humberside
PM	Addictive Games	PO Box 278 Conniburrow Milton Keynes MK14 7NE
PN	Hartland Software	8 Penzance Place London W11 4PA
PO	C Tech	184 Market Street Hyde Cheshire
PP	Severn Software	5 School Crescent Lydney Glos GL15 5T
PR	Cambell Systems	Rous Road Buckhurst Hill Essex IG9 6BL
PS	ACS Software	7 Lidgett Crescent Roundhay Leeds
PI	Oxford Computer Publishing	PO Box 99 Oxford
PQ	Mikro Gen	24 Agar Crescent Bracknell Berks
PU	Saturn Developments	37 Heol Dulais Birchgrove Swansea SA7 9LT
PV	Crystal Computing	50 Charles Close Wroxham Norwich NR12 8TU
PW	Impact Software	70 Redford Avenue Edinburgh EH13 0EW
PX	Melbourn House Publishers	131 Trafalgar Road Greenwich London SE10
PY	Hisoft	60 Hallam Moor Lidon Swindon Wiltshire
PZ	Hilton Computer Services	14 Avalon Road Orpington Kent BR6 9AX
QA	Automata Ltd	65a Osbourne Road Portsmouth PO5 3LR
QB	Work Force	140 Wilsden Avenue Luton Beds LU1 5HR
QC	Transform Ltd	41 Keats House Porchester Mead Beckenham Kent
QD	MC Lothlorian	4 Granby Road Cheddle Hume Cheshire SK8 6LS
QE	Amba Software	Freepost Cambridge CB3 7BR
QF	Palantir Programs	Brockham Hyde Lane Danbury Essex
QG	PDQ Software	Parsley Rye Hilders Lane Edenbridge Kent TN8 6JU

REFERENCE

SOFTWARE LISTING

ZX81

Title	Program Type	Program Produced By	Memory Req'd	How Sold	Supplier Codes	Price
Bagatelle	Gm	Cambell Systems	1K	C	CN	£4.00
Bank Account	Bs	Transform	16K	C	GZ	£8.75
Bank Account	Bs	Transform	32K	C	GZ	£10.75
Battleships/Kami-Kazi Drive	Gm	V&H Computer	16K	C	IL	£3.50
Battle of Britain	Gm	Micro Games	16K	C	CN	£4.50
Beam Analysis	Bs	Hilderbay	16K	C	FW	£25.00
Biology 1	Ed	AVC Software	16K	C	IM	£3.00
Biology 2	Ed	AVC Software	16K	C	IM	£3.00
Bearings	Ed	Bryant S/W	16K	C	HW	£1.87
Breakout	Gm	Anglo American	16K	C	GB	£4.50
Breakout	Gm	Bug Byte	1K	C	CN	£3.50
Brick-Stop	Gm	R & R Software	16K	C	HF,HQ	£3.75
Budget & Address Book	Do	Mr Purves	16K	C	CV	£4.00
Budget Programs (2)	Bs	Hilderbay	16K	C	FW	£17.00
Bumper 7	Gm	Software Masters	1K	C	AO	£4.95
Cassette 1	Gm	Michael Orwin	1K	C	DF	£3.80
Cassette 2	Gm	Michael Orwin	1K	C	DF	£5.00
Cassette 3	Gm	Michael Orwin	16K	C	DF	£5.00
Cassette 4	Gm	Michael Orwin	16K	C	DF	£5.00
ZX-Scramble						
Gunfight						
Invaders						
Galaxy Invaders						
Snakebite						
Fungaloids						
Life						
3D Tic Tac Toe						
Cassette G10	Gm	Psion	16K	C	BC,DW	£5.95
Backgammon						
Cassette G11	Gm	Psion	16K	C	BC,DW	£6.95
Chess						
Cassette G12	Gm	Psion	8K	C	BC,DW	£4.75
Perilous Swamp						
Sorcerer's Island						
Cassette G13	Gm	Psion	16K	C	BC,DW	£3.95
Space Raiders						
Bomber						
Cassette G14	Gm	Psion	16K	C	BC,DW	£5.95
Flight Simulation						
Cassette G2	Gm	Psion	16K	C	BC,DW	£4.95
Feet/Metres Conversion						
Rings Round Saturn						
Secret Code						
Mind Boggling						
Silvette						
Memory (Educ)						
Cassette G3	Gm	Psion	16K	C	BC,DW	£4.95
Train Race						
Challenge						
Secret Message						
Mind That Meteor						
Character Doodle						
Currency Conversion						
Cassette G4	Gm	Psion	16K	C	BC,DW	£4.95
Down Under						
Submarines						
Doodling With Graphics						
Invisible Invader						
Reaction						
Petrol Conversion						
Cassette G5	Gm	Psion	16K	C	BC,DW	£4.95
Martian Knockout						
Graffiti						
Find the Mate						
Labyrinth						
Drop a Brick						
Continental (Educ)						
Cassette G6	Gm	Psion	16K	C	BC,DW	£4.95
Galactic Invasion						
Journey into Danger						
Create						
Nine Hole Golf						
Solitaire						
Daylight Robbery						
Cassette G7	Gm	Psion	16K	C	BC,DW	£4.95
Race Track						
Chase						
Nim						
Tower of Hanoi						
Docking the Spaceship						
Golf						
Fascinating Tower of Hanoi (problem)						
Cassette G8	Gm	Psion	16K	C	BC,DW	£4.95
Tower Trail						
Blank						

SOFTWARE DEALERS

QII Fuller Macro Systems
The ZX Centre
Sweeting Street
Liverpool 2

QJ Tasman
17 Harley Crescent
Leeds
LS6 2LL

QI Video Software
Stone Lane
Kinver
Stourbridge
West Midlands

QK Kricon Ltd
11 Medway
Haikham
East Sussex
BN27 3HE
0323 846110

Cassette G9	Gm	Psion	16K	C	BO,DW	£6.95
Bio-Rhythms						
Your Bio-Rhythms						
Catacombs	Gm	J K Greye	15K	C	CN	£4.95
Catalogue	Ed	Bryants S/W	16K	C	HW	£1.87
Centipede	Gm	dK'tronics	16K	C	EE,CN	£4.95
Centipede (Graphics)	Gm	dK'tronics	16K	C	EE	£4.95
Champions Quiz	Ed	Rose Cassettes	16K	C	CN	£4.50
Character Predictor	Do	Hard & Soft	1K	C	HZ	£3.95
					3K	
Chess	Gm	Micro Gen	16K	C	DZ	£6.50
Chess Board	Gm	Hard & Soft	1K	C	HZ	£3.95
Chess I.4	Gm	Abersoft	16K	C	HX	£8.95
Chess II Special	Gm	Artic	16K	C	EH	£45.00
Claws	Ed	Bryants S/W	16K	C	HW	£1.87
Compound	Ed	AVC Software	16K	C	IM	£3.00
Computer Count ZX	Bs	Silicon Tricks	16K	C	CN	£7.95
Constellation	Gm	Anglo American	16K	C	GB	£8.00
Counter	Gm	Pizel	16K	C	CN	£5.50
Critical Path Analysis	Bs	Hilderbay	16K	C	FW	£15.00
Crystal Ball	Do	Hard & Soft	1K	C	HZ	£3.95
					3K	
Cursor Input	Ut	Serious S/W	1K	C	II	£2.95
					1.6K	
Damsel & the Beast	Gm	Anglo American	16K	C	GB	£6.50
Damsel & the Beast	Gm	Bug Byte	16K	C	CN	£6.50
Data Base	Bs	Mr Purves	16K	C	CV	£10.00
Data Base	Ut	Cambell Systems	16K	C	CN	£10.00
Data File/Graphics	Ut	V&H Computer	16K	C	IL	£2.50
Death Isle	Gm	Buffer	16K	C	CN	£4.50
Defender	Gm	Quicksilva	16K	C	CN	£5.50
Deflex	Gm	dK'tronics	16K	C	EE	£3.95
Dictator	Gm	Anglo American	16K	C	GB	£9.00
Dictator	Gm	Bug Byte	16K	C	CN	£9.00
Diggles Kitchen	Do	Micro Computer	16K	C	HK	£4.99
S/W						
Diggles Kitchen Vol 1	Do	Micro Computer	16K	C	HK	£4.99
S/W						
Diggles Kitchen Vol 2	Do	Micro Computer	16K	C	HK	£4.99
S/W						
Diggles Kitchen Vol	Do	Micro Computer	16K	C	HK	£4.99
S/W						
Double Breakout	Gm	Beam Software	1K	C	BT	£6.00
Dragon Maze/Life	Gm	Software Masters	16K	C	AO	£6.95
Electricity	Ed	AVC Software	16K	C	IM	£3.00
Encounter	Gm	Pixel	16K	C	CO	£5.50
Fast Life	Gm	dK'tronics	16K	C	EE	£3.95
Financial Package	Bs	Hilderbay	16K	C	FW	£8.00
Football Manager	Bs	Addictive Games	16K	C	HG	£7.95
					CN	£9.95
Forces	Ed	AVC Software	16K	C	IM	£3.00
Forensic	Ed	AVC Software	16K	C	IM	£3.00
Forth Compiler	Ut	Artic	16K	C	EH	£35.00
Fortress/Pontoon	Gm	V&H Computer	16K	C	IL	£3.50
French	Ed	AVC Software	16K	C	IM	£3.00
GB Ltd	Gm	S W Hessel	16K	C	CN	£5.25
GCE Maths	Ed	Rose Cassettes	16K	C	CN	£4.50
Galaxian	Gm	Artic	16K	C	EH,BT	£3.95
					AB	£5.50
Galaxy Warrior/Star Trek	Gm	Artic	16K	C	EH,BT	£6.50
					AB	£5.50
Games Pack I	Gm	Silversoft	16K	C	CN	£4.95
General Knowledge	Ed	A.Parsons	16K	C	HV	£4.95
Geography	Ed	Psion	16K	C	BO,DW	£6.95
Geography	Ed	AVC Software	16K	C	IM	£3.00
Gold	Gm	Hilderbay	16K	C	CN,FW	£8.00
Gobbleman	Gm	Artic	16K	C	EH	£3.95
Graph	Ed	AVC Software	16K	C	IM	£3.00
Golf	Gm	R & R Software	16K	C	HP,HQ,HR	£3.75
Gospel Stories	Ed	Bryants S/W	16K	C	HW	£1.87
Grapix 2	Ut	Nick Godwin	16K	C	HU	£6.99
Greedy Gulch	Gm	Phipps Associates	16K	C	HL	£5.00
Gulp	Gm	Cambell Systems	16K	C	CN	£4.00
Hangman	Gm	Nick Godwin	16K	C	HU	£2.99
Hedgehog & Co	Gm	Buffer	1K	C	CN	£3.00
High Res. Graphics	Gm	Macronics	16K	C	CN	£4.00
History	Ed	Psion	16K	C	BO,DW	£6.95
House of Gnomes	Gm	Anglo American	16K	C	GB	£7.00
Human Biology 1	Ed	AVC Software	16K	C	IM	£3.00
Human biology 2	Ed	AVC Software	16K	C	IM	£3.00

It's easy to complain about advertisements.

Every week, millions of advertisements appear in the press, on posters or in the cinema.

Most of them comply with the rules contained in the British Code of Advertising Practice and are legal, decent, honest and truthful.

But if you find one that, in your opinion, is wrong in some way, please write to us at the address below.

We'd like you to help us keep advertising up to standard.

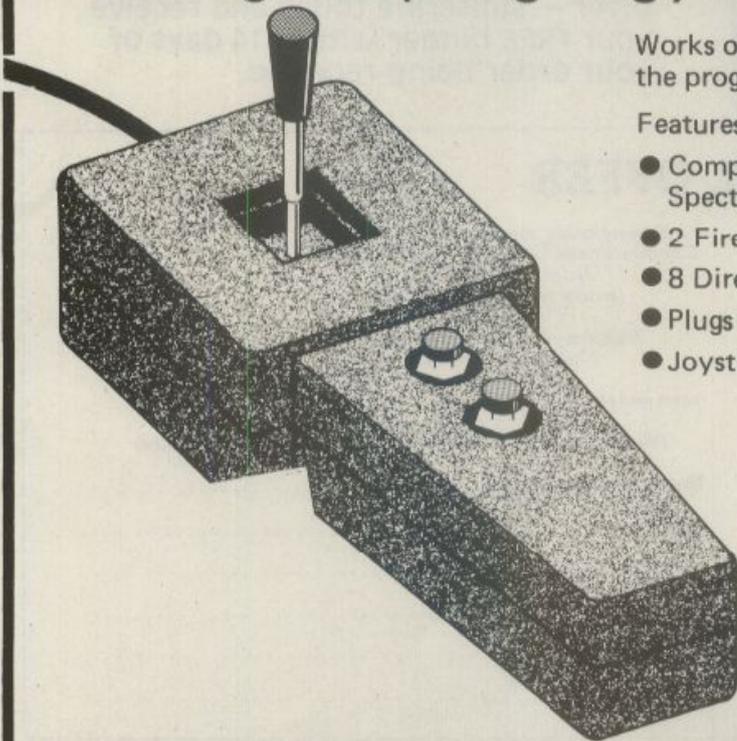


The Advertising Standards Authority.
If an advertisement is wrong, we're here to put it right.

A.S.A. Ltd., Brook House, Torrington Place, London WC1E 7HN.

At last! A joystick that works!

Cambridge Computing bring you the first **intelligent** joystick.



Works on all existing software — regardless of which keys the program uses. No need for specially written software.

Features:

- Compatible with:
Spectrum, ZX81, Jupiter Ace
- 2 Fire buttons
- 8 Directions
- Plugs into edge connector
- Joystick and Interface £26.00

Name

Address

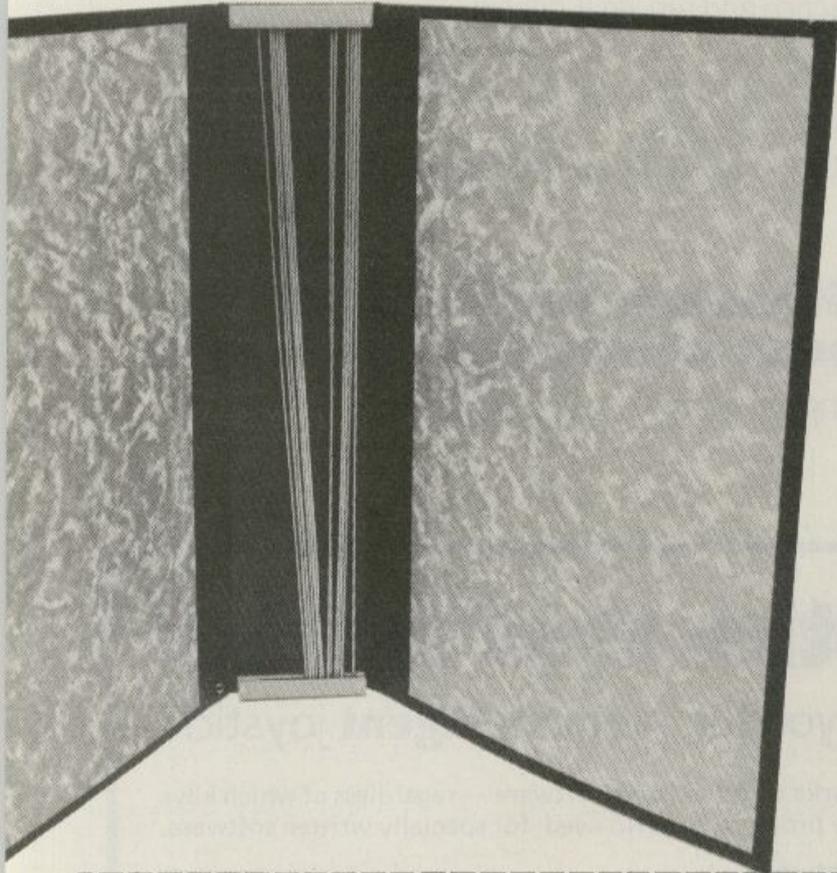
Please send me.....joysticks @ £26.00 for the
Spectrum ZX81 Jupiter Ace

Cheques and P.O.s made payable to:
Cambridge Computing,
1 Benson Street, Cambridge CB4 3QJ.

Dealer enquiries welcome please ring C P Lloyd on
Cambridge (0223) 522905

SAVE £4.25 by receiving a FREE magazine binder when you subscribe to

Personal Computing Today



Its true, by subscribing to Personal Computing Today you will not only receive your personal copy direct to your door for a whole year but also have a superb A.S.P. magazine binder in which to keep your copies AND ITS FREE!

All you have to do to receive your FREE binder is book a new subscription or renew an existing subscription to Personal Computing Today before 30th April 1983. What could be simpler? Normally priced at £4.25, these attractive binders will hold approximately 12 issues of Personal Computing Today.

Not for you any longer the chore of having to track down dogeared copies of your favourite magazine, instead you will merely go to your bookshelf and they will be waiting for you in pristine condition.

Don't miss out on this outstanding offer — subscribe today and receive your FREE binder within 14 days of your order being received.

SPECIAL OFFER

Cut out and SEND TO :

Personal Computing Today

**513, LONDON ROAD,
THORNTON HEATH,
SURREY, CR4 6AR
ENGLAND.**

Please send my free binder and commence my personal subscription with the Issue

SUBSCRIPTION RATES
(tick as appropriate)

£12.25 or 12 issues UK
£14.10 for 12 issues overseas surface
£30.00 or 12 issues Air Mail

I am enclosing my (delete as necessary)
Cheque/Postal Order/International Money
Order for £.....
(made payable to ASP Ltd)
OR
Debit my Access/Barclaycard *
(*delete as necessary)

Insert card no.

Please use **BLOCK CAPITALS** and include post codes.

Name (Mr/ Mrs/ Miss)
delete accordingly

Address

Signature

Date

If you're not in the Educational establishment, please call and ask for our general prices either end user and trade.

DISKING

EDUCATIONAL SALES DEPARTMENT
Liphook, hants, GU30 7EJ, U.K.
TEL (0428) 722563 TELEX 849131 G

AMAZING
EDUCATIONAL
DISCOUNTS ON

MEMOREX FLOPPY DISKETTES

Memory Excellence

Without doubt the PRICE/PERFORMANCE winners with their new Japanese media. Such high quality, is currently yielding zero reject rates and certification levels easily surpassed in actual performance. Protected by a special anti-static lubricant, head performance and media life are also extended.

5 1/4" DISKETTES

Certified for single OR Double density, and with hub ring reinforcement.

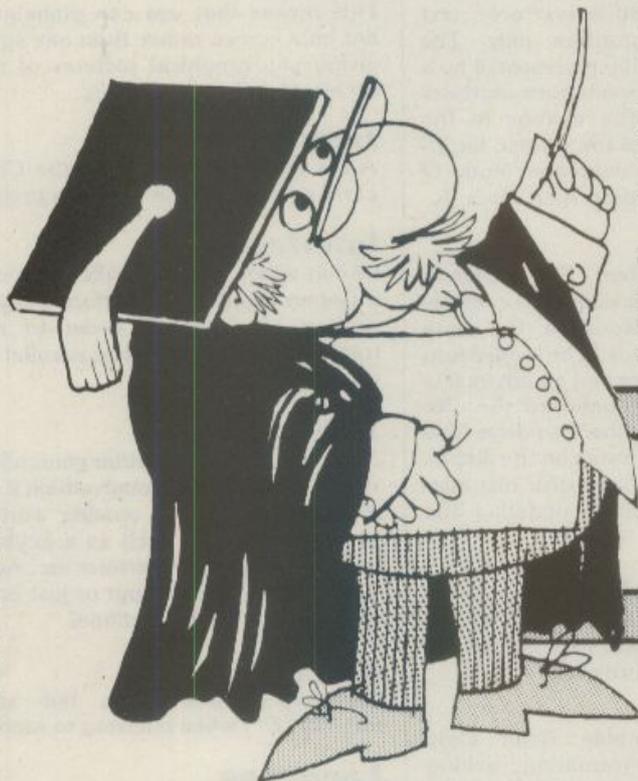
	EXC VAT
3481 S/Sided 48 tpi	£18.90
3491 D/Sided 48 tpi	£24.90
3504 S/Sided 96 tpi	£25.90
3501 D/Sided 96 tpi	£32.90

48 tpi suitable for 35 or 40 track operation
96 tpi suitable for 77 or 80 track operation
10 & 16 Hard Sector available at same prices

8" DISKETTES

	EXC VAT
3060 S/Sided S/Density	£21.90
3090 S/Sided D/Density	£24.90
3102 D/Sided D/Density	£30.90

32 hard sector available at same prices



LIBRARY BOXES

LB5 for minidisks £2.20
LB8 for 8" disks £2.30
Prices EXC VAT

CLEANING KITS

Prevent head crashes and ensure efficient error-free operation. Enough for 26 bi-monthly cleans & a lot cheaper than a service call!
CK5 for 5.25" disk drives £14.90
CK8 for 8" disk drives £14.90
Prices EXC VAT

PLEASE TEAR ME OUT - YOU'RE SURE TO NEED ME LATER

ALL ORDERS FOR DISKING EDUCATIONAL SALES DEPARTMENT

PLEASE CLEARLY MARK YOUR ORDERS FOR THE ATTENTION OF DISKING EDUCATIONAL SALES DEPARTMENT.

These special low prices, apply to Educational Establishments. We will despatch goods on receipt of an official order, for order values over £30.00 inc. VAT. We do this on the UNDERSTANDING THAT INVOICES WILL BE SETTLED WITHIN THIRTY DAYS or

preferably less please.

Alternately, you may send your remittance with your order if you so wish. Also bear in mind, that you do have to pay VAT, which will be added to these prices. If you are in any doubt, please see the coupon on this ad., to help with your calculations, or telephone us for assistance.

NO FREE GIFTS are included, at these prices.

U.K. P&P RATES INC INS. EXC. VAT

Minidisks 1-2 PACKS each pack @ 95p
Minidisks 3-5 PACKS each pack @ 75p
Minidisks 6-9 PACKS each pack @ 60p
Minidisks 10+ PACKS * POST FREE *
8" disks 1-2 PACKS each pack @ £1.60
8" disks 3-5 PACKS each pack @ £1.20
8" disks 6-9 PACKS each pack @ 90p
8" disks 10+ PACKS * POST FREE *
LB5 5.25" Library box 1-4 off @ 40p
LB5 5.25" Library box 5-9 off @ 30p

LB5 5.25" Library box 10+ @ 20p
LB8 8" Library box 1-4 off @ 60p
LB8 8" Library box 5-9 off @ 45p
LB8 8" Library box 10+ off @ 30p
For CK5 5.25" Cleaning kit read Minidisk postal rates 10+ POST FREE
For CK8 8" Cleaning kit read 8" disk postal rates 10+ POST FREE
For SDL or SCLX (5.25" version only) read Minidisk postal rates.

To:

DISKING EDUCATIONAL SALES DEPARTMENT
Liphook, Hants, GU30 7EJ, U.K.
TEL (0428) 722563 TELEX 849131 Telbar G

QTY	DESCRIPTION	PRICE EXC VAT
		£
		£
		£
	TOTAL GOODS VALUE EXC. VAT	£
	TOTAL DELIVERY AND INSURANCE	£
	SUB TOTAL EXC. VAT	£
	VAT	£
	TOTAL VALUE OF ORDER	£

Name:

Address:

Tel No:

Or please charge my credit card No:

ACCESS VISA & DINERS CARD WELCOME

MICROTERMS

Address

A label or name (usually a *binary* or *hexadecimal* number) specifying a particular *memory* location.

Array

A special variable that is used to hold large amounts of string or numeric information in a row and column format.

Assembly Language

Means of representing *program* statements in mnemonics and conveniently handling *memory* addressing by use of symbolic terms.

BASIC

Beginner's All Purpose Symbolic Instruction Code. An easy to learn, widely used computer language.

Bit

A single *binary* digit, representing either a 'one' or a 'zero'.

Bug

An error in *software*.

Byte

A *binary* number, usually of eight *bits*. It can represent a number from 0 to 255 (8-bit byte) as there are 256 possible combinations of "ones" and "zeros" eight bits long.

Cartridge

A self-contained unit storing either ROM or RAM which plugs into a computer to expand the memory or provide a program.

Character Set

The list of letters, numbers and symbols that you can use to write programs and display information.

CP/M

A standard disc operating system that in theory allows software packages to be run on different machines. It stands for Control Program for Microcomputers.

Cursor

Character or graphic symbol used by the computer to denote where it's printing. Also used as a prompt to input information or a command.

Data

Simply, information. The raw material that the computer processes.

Debug

To correct the errors in a *program*.

Disc

Magnetic storage device allowing fast random access to a large volume of *data*. A full-size hard disc will hold, say, 5 *megabytes* or more; a smaller *floppy disc* typically holds from 80 to 250 *kilo bytes* but in either case the capacity is being increased all the time.

Display Mode

Means of indicating the form in which the computer's output will appear on the VDU screen. It is either text only, text and graphics or graphics only. The display mode is usually represented by a number and the difference between these numbers indicates the change in the display capabilities of the screen, for instance on the BBC computer Mode 0 gives a higher resolution than Mode 1.

DOS

Disc Operating System. This refers to the piece of computer code that controls the action of the disc drive. On some machines this code has to be loaded into the machines memory and on others it is present in the ROM onboard the disc drive. The DOS tells the disc drive how to load and save programs on the disc as well as carrying out any disc management functions such as updating the directory.

Dummy Variable

This is a variable that is defined at the beginning of a program that has no use until later on in the program.

EPROM

Erasable Programmable Read Only Memory. When programming, writing typically takes one minute and erasing, by ultra-violet light, 10 minutes or longer.

Get

A BASIC command. It tells the computer to search the keyboard and bring back the value of the first key pressed.

Gosub

A BASIC command telling the computer to go to a subroutine within a program.

Gcol

A colour command used in BBC Basic.

Hard Copy

A computer printout or listing on paper.

Hardware

All the electronic and mechanical components making up a computer system.

Hex

Shortened version of hexadecimal, meaning '6 plus 10', which is a funny way of saying 16. It refers to the number system with a base of 16. This uses 0 to 9 and then A to F of the alphabet to represent its 16 digits. Two hex digits can be conveniently used to represent a byte (eight bits).

High Resolution

This means that you can pinpoint one dot on a screen rather than one square, giving you graphical pictures of much greater detail and accuracy.

Instruction

A set of *bits* which causes the CPU to carry out a particular task in a program.

Interface

Circuit which connects different parts of a system together and performs any processing of signals in order to make transfer possible (ie serial-parallel conversion).

I/O

Input/Output. A computer generally has one or more *ports* through which it communicates with 'the outside world' — peripheral devices such as a keyboard, video display (VDU), printer etc. An I/O port may be just an input or just an output or it can be bidirectional.

Kilo (K)

Normally means 1000, but stands for 1024 (2¹⁰) when referring to memory.

Language

A repertory of commands — symbols, expressions etc, used to 'call up' the instructions or procedures a processor can execute.

Location

Physical position; *memory* location is the same as *address*.

Loop

Program technique where one section of program (the loop) is performed many times over.

Machine Language (or Code)

The lowest (and most tediously detailed)

level of *program instructions*. All higher level coding must be converted to *machine language* (by *compiler* or *interpreter*) before a *processor* can obey it.

Memory Map

Chart showing how *memory* is used by a computer. The arrangement of *data* and *program* within the memory.

Menu

A set of options displayed on-screen by a computer program from which the computer user can make a selection to implement.

Modulator

A device, included in every good hobby computer, which takes the computer's output and converts it to an RF signal on a suitable TV channel, giving you a cheap, convenient visual display.

Monitor

(1) The first level of computer *operating systems*: the *program* which turns *machine code* commands into action, managing input, output etc.
(2) A TV-type device which is specially constructed to handle video signals from a computer that does not have a *modulator*.

Parallel / Serial

Denotes the manner in which the computer's output is sent to its peripheral devices. Serial means that the information is passed out one byte after another and it uses a system of special characters to signify control codes of the device. Parallel communications are sent out along a series of wires using the high or low state of the wire to indicate which bits are set and therefore making up a byte.

Pascal

A very powerful, structured computer language, available on a variety of microcomputers.

Peek

This BASIC command reads a value from a location in the computer memory. It can be used to access either RAM or ROM.

Peripheral

Device attached to a computer, eg *printer*, *plotter*, *disc* unit, but not necessarily essential to its use.

Pixel

The single dot that is used to create characters displayed on the VDU. Also

the smallest display unit when using high resolution graphics.

Poke

This command places a value in a location of the computer's memory. It can only be used to access RAM or control registers.

Port

Terminal which the CPU uses to communicate with the outside world.

Print At

A BASIC command telling the computer where to begin printing.

Print Out

Same as *hardcopy*.

Program

A set of *instructions*, which tells the computer to perform a sequence of tasks also called *software*.

PROM

Programmable Read Only Memory. Proms are a special form of ROM, which can be individually programmed by the user.

Qwerty

The traditional typewriter keyboard layout adopted by computer designers.

RAM

Random Access Memory. *Data* may be written to or read from any location in this type of memory.

Register

A general-purpose *memory*, or set of *memory locations*, built into the *micro-processor* itself. Sometimes, particular registers may be designated for a specific purpose.

RND

In BASIC this stands for RANDOM and instructs the computer to select random numbers, it is often used in games programs. Because the numbers thrown up are mathematically related to the number preceding they are called pseudo-random numbers, not true random-numbers.

ROM

Read Only Memory. *Memory* device which has its *data* content established as part of manufacture and cannot be changed.

Routine

A whole *program* or part of a program designed to perform a single function or action.

RS232

A communications *interface* used for *modems* and for serial *printers*.

Sequential File

This is a data file that can be created on either a disc or a cassette system. As its name suggests, the information is stored one piece after another. If this information is to be changed or modified in any way then the whole file has to be read back into memory and then written back again once the changes have been made.

Software

The different kinds of *program* required to work a computer.

Source Code

Program written in one of the *high-level languages* and requiring *compilation* into *machine language* before use.

String

A sequence of characters used in a program.

Subroutine

A part of a *program* which performs a specific task and which is available for use elsewhere in a program, as often as you like.

Syntax

The grammar of a programming language.

Tab

Really stands for tabulate and allows you to automatically put figures and/or words into columns, forming a table.

Toolkit

Name given to a piece of code that runs in a computer independently of any other programs and adds commands to the machine's language to make the process of programming or debugging easier. Commands such as Renumber, Auto and Trace are common in toolkits. Toolkits take the form of a program that is loaded into the machine on power-up or a chip that is inserted on the circuit board which is then initialised by a SYS or USR call from the operator.

Variable

A symbol used in programming which is assigned a numeric memory address. You can change the value of variable at will to suit the program you are writing.

VDU

Visual Display Unit. Usually a TV set in hobby computers, but may be a video monitor which accepts the output directly from the computer.

Z80

Widely used microprocessor. It is used in the ZX81, Spectrum and TRS-80.

6502

Another widely used microprocessor. It is the heart of the PET, Apple and Atari computers.

PERSONAL COMPUTING TODAY

Lineage: 35p per word.

Semi display: £8.00 per single column centimetre
Ring for information on series bookings/discounts.

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



01-437 1002
EXT 297

Send your requirements to:
SALLY COLLINS
ASP LTD, 145 Charing Cross Road,
London WC2H 0EE.

ACCESSORIES

DUST COVERS

VIC 20/64 DRAGON 32
ATARI 800 CASS UNIT C2N.
C2N1530 & ATARI in natural
quality vinyl. Just send **£2.95**
or **£3.95** to inc. cass. cover,
stating computer and cassette
model. (No stamp required.)
Cassette cover only **£1.50** to:
ALLEN ENTERPRISES
Freeport, Luton LU2 8BR

BROKEN YOUR TV/COMPUTER JOYSTICK?



Inside your joystick handle is
a white plastic insert. (The
main cause of failure.)
Stronger insert replacements
now available. Supplied
with full fitting in-
structions allowing
you to be back in
action in seconds.
Send **£2.50** per
inc. p&p to:

COMPUTER SUPPLIES (PCT), 146
Church Road, Boston, Lincs PE21 0JX.

COLOUR TVs. Ideal for computer
use £40.00 (discount for clubs).
Phone 0795 533979/537095
(Kent).

HARDWARE

NEWBRAIN

The professional micro computer for the
price of the hobby machine. Delivery free.
Models A and AD in stock. Call us for
special offer prices. Mail Order. Access
accepted.

Ring us on Stevenage
(0438) 812439

anytime for the latest details of
NEWBRAIN hardware, software,
user groups etc.

New EPSON, CP80 and JUKI PRINTERS

ANGELA ENTERPRISES,
4 Ninnings Lane, Rabley Heath,
Welwyn, Herts AL6 9TD.

**Splice
Video**

FOR

CUMANA & MICROVITEC
1431/MS Monitor **£245 + VAT**
Dual Disc Unit for BBC
Micro **£345 + VAT**

**ACCESS AND VISA CARDS
WELCOME**

Telephone: 01-845 6705

ADD-ONS

UPGRADE YOUR 16K ZX SPECTRUM TO 48K

**SIMPLY FITS INTERNALLY WITH NO SOLDERING ON
SERIES 2 MODELS. UNLIKE COMPETITORS, WE USE NO
REJECT COMPONENTS AND AN ADAPTOR P.C. BOARD TO
ACHIEVE RESULTS. DESIGNED BY EX SINCLAIR ENGINEER.
MODEL CP48 £23.95 inc. P&P (EXPORT AND UK). EX STOCK.**

32K MEMORY EXTENSION ONLY £23-95

Citadel Products Ltd TEL: 01-951 1848
DEPT PCT 50 HIGH STREET, EDGWARE, MIDDLESEX HA8 7EP.

INSURANCE

INSURE YOUR COMPUTER

Impact damage, Fire and Theft
insurance for your Computer,
Equipment

£1 to £1,500 cover	£8.00 pa £10 x/s
£1,501 to £2,500	£16.00 pa £15 x/s
£2,501 to £8,000	£16.00 pa £25 x/s
£8,001 to £10,000	£20.00 pa £25 x/s

FOR DETAILS: KGJ Insurance
Brokers, 8 Hagley Road, Stour-
bridge, West Midlands DY8 1QG.
Tel: (03843) 5333/2545

SERVICES

COMPUTER & PERIPHERAL SERVICES, ASSTEAD OFFER

On-site maintenance contracts
on BBC Computers and
peripherals at 15% of total cost.
12½% on 5 or more Schools,
dealers etc. One-off on-site
service £30 plus parts. 24 hour
call.

TEL: Ashtead 74297

SINCLAIR SPECTRUM USERS!

Non-commercial venture for
buying, selling and exchanging
programs. Send S.A.E. for details,
The Secretary, V.G.E.S., 25 Rona
Road, London NW3 2HY.

**OFFERING A
SERVICE?
FOR COST
EFFECTIVE
RESULTS CALL
ASP CLASSIFIED
01-327 1002**

COURSES

COURSES AVAILABLE

Stay Friday to Sunday at one of Worces-
tershire's finest Hotels and learn "Basic"
on Commodore 64's. All rooms have bath,
colour TV, etc. 14 hours of instruction
from a qualified lecturer, maximum of 20
people on each course. 10 computers.
Cost **£65.00** fully inclusive. Write for
brochure to:

Gainsborough House Hotel,
Bewcley Hill, Kidderminster.
Telephone: 0562 754041

NATIONWIDE SHOPS & DEALERS

northern computers

THE
COMPUTER
CENTRE
OF THE
NORTH

THE
showroom
for all the
leading
micros

easy parking off the M56 (Junc 12) · VIC 20 · VIC 64
· BBC micros · Newbrain · Acorn Atom · Books
· Apple 11e, 111 · Dragon · Electron · Games
· Sinclair Spectrum · IBM P.C.
· Secondhand computers · EASY PAYMENTS
· ALL ACCESSORIES SALES AND SERVICE ·

northern computers

Churchfield Road,
FRODSHAM
Cheshire WA6 6RD

TEL: FRODSHAM (0928) 35110 UNBEATABLE
WE WILL PURCHASE AND PUBLISH YOUR PROGRAMS. Call Steve Rhodes for details. PRICES

ASP CLASSIFIED

01
437
1002

BOOKS AND PUBLICATIONS

DRAGON 32 / TANDY COLOR
Now 4 — yes 4 — fabulous
magazines just for you!

"Rainbow", "Color Computer News",
"Color Computer Magazine", "Hot Co-
Co", all plus EXCLUSIVE U.K./European
Supplement & Free advisory service
Send **£2.25** (+ 57p S.A.E.) for sample copy
to:

ELKAN ELECTRONICS
(Dept PCT), FREEPOST, 11
Bury New Road, Prestwich,
Manchester M25 6LZ.
Tel: 061 798 7613

WANTED

PROGRAMMERS SOFTWARE AND HARDWARE PRODUCERS U.S. MARKET

We are looking for high quality Software and Hardware
for **Timex 2000 (ZX Spectrum)**, **Dragon**, **BBC** and
Oric 1 to be marketed on a royalty or direct marketing
basis.

Your product will reach all end-users through our pro-
fessional marketing strategy.

Send information, proposals, and samples to:

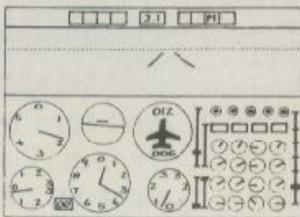


Intercomputer Inc., 176 Newbury Street,
Boston, MA 02116
Tel: (617) 437-1190 Telex: 951141 COFAR

SOFTWARE GAMES

DRAGON/32 BBC MODEL/B TRS80 C/C 32K 747 FLIGHT SIMULATOR

Superbly realistic instruments and pilot's view in lifelike simulation which includes emergencies such as engine fires and systems failures. This program uses high resolution graphics to the full to produce the most realistic flight-deck display yet seen on a home computer. There are 21 real dials and 25 other indicators (see diagram). Your controls operate throttle, ailerons, elevators, flaps, slats, spoilers, landing gear, reverse thrust, brakes, etc. You see the runway in true perspective. Uses joysticks and includes options to start with take-off or random landing approach. "A real simulation, not just another game." (Your Computer Apr 83). Cassette £9.95 (PP and VAT included)



D.A.C.C. Ltd. (Dept PCT) 23 Waverley Road, Hindley, Gtr. Manchester WN2 3BN

SOFTWARE FOR TANDY COLOR & DRAGON

REF	ADVENTURES	PRICE
1001	LOST IN SPACE	16K 5.00
1002	DRACULA'S CASTLE	16K 5.00
1003	DEATH PLANET	16K 5.00
1004	FLOATING BOMB	16K 5.00

REF	GAMES	PRICE
2001	STAR TREK	16K 7.00
2002	A-MAZE-IN	16K 10.00
2004	OWNERSHIP	32K 10.00
2006	GAMES PACK 1	4K 5.00
2007	GAMES PACK 2	16K 5.00

Send SAE for catalogue. State if TANDY or DRAGON. All prices include P&P and VAT. Cheques or Postal Orders to:-
FLATBELL LTD (DEPT PCT)
9 Franklin Road
HADDENHAM
BUCKS HP17 8LE

VIC 20 UNEXPANDED, "Genearo" marvellously addictive adventure game for everyone. Send SAE and cheque/PO for £4.50 to: John Lundberg, 50 Woodcock Dell Avenue, Kenton, Middx HA3 0NF. Tel: 01-908 1673.

TI-99/4A Grand Prix for unexpanded machine £3.95. Programs wanted for unexpanded TI-99/4A for 20-25% royalties, send on cassette. Microsonic, 85 Malmesbury Road, Cheshire Hulme, Cheshire.

BBC MICRO

M & M SOFTWARE PRESENTS
Konexion (four in a row)..... £5
Pontoon (keep your money)..... £5

BOTH SUPERB GRAPHICS
Language Lab..... £7.50
(French, German, Italian & Spanish)

SPECIAL OFFER All 3 for £12 P&P
1391 Leek Road,
Stoke-on-Trent ST2 8BW
(SAE FOR LIST)

TEXAS TI99/4A

GM4	Snake (graphics)	£4.95
GM5	Haunted House	£4.95
GM6	Sorcerer's Castle	£4.95
GM7	3-D Maze (graphics)	£3.95
GM17	Forbidden City	£4.95
GM21	Chalice (graphics)	£4.95
GM22	Bomber (graphics)	£4.95
The Texas Program Book (35 programs for the TI99/4A)		£5.95

Send SAE for full list. Orders under £6 please add 50p P&P. Orders over £6 post free. Send cheque or P.O. to:

APEX SOFTWARE (PCT)
115 Crescent Drive South,
Brighton BN2 6SB.
Tel: Brighton (0273) 36894
Access/Barclaycard welcome

I DON'T MINED — Out to rescue Bill (TW).

T I SWOP SHOP SPECIAL OFFER 2 FOR 1

You send us 1 quality game on tape (including the instructions). Plus £1 and S.A.E. We'll send you 2 quality taped games.

T I SWOP SHOP
49 Curzon Road, Maidstone,
Kent. Tel: 0622 682815

ZX 81 (16K) Poker, Brag and Dominoes on cassette. Any pair for £2.35 inc. From W. Jefferson, 29 Arundell Walk, Pelton, Chester-le-Street, Co. Durham.

ATARI 400/800 OWNERS Atari Software at unbelievable prices

Battle for Normandy (D)	£20.00
Bandits (D)	£18.00
Temple of Apshai (D)	£18.00
Fort Apocalypse (D)	£18.00
Wayout (D)	£20.00

RING: 01-236 9586 extn 10

CHRISTINE COMPUTING TI99/4A SPECIALISTS

SOFTWARE GAMES

North Sea, Astrofighter, Code Break, Blast It!, Core! All at **£3.50** each, **£6.50** for 2 or **£9.00** for 3. Literature (tape and booklet).

Programming the TI99/4A, Handy Subprogram **£4.50** each, **£8** the pair.

Cassette interface lead, single cassette **£3.95**.

For free advice or list send SAE to:

6 Florence Close, Watford, Hertfordshire.

NEW DRAGON 32 NEW CHOPPER BLITZ

Destroy the city and parachute to safety **£7**
GOBBLER (+) A Maze Chase then thru the tunnel to real danger **£6.50**

SAE & 50p for Catalogue to:
SAINT GEORGE SOFTWARE
Dept PCT, 73 Ling Street,
LIVERPOOL L7.

FOR SALE

ATARI 400 — 16K Basic Cartridge and manuals. Atari cassette program recorder. Cassette programs — Airstrike, Crypts of Terror, two joysticks, £185. 01-677 9037 after 6pm.

DRAGON 32 & TANDY COLOR

FREE

Over 850 people at recent exhibitions have tried but unable to complete this new challenging board game.

We are giving away free to the first 10 people to complete correctly our Knights program, 4 different adventure games, all £10.

Send £5 for a copy of Roving Knight 16K Ext Basic.

State if Tandy or Dragon. Send SAE if catalogue required.

FLATBELL LIMITED (???)
9 Franklin Road, Haddenham,
Bucks HP17 8LE.

T. SMITH SOFTWARE

Full colour catalogue of Atari, Dragon, CBM 64 and Vic 20 software. 80p (refundable first order). SAE only for TRS 80 Genie Catalogue.

**26 WESLEY GROVE
PORTSMOUTH, HANTS
PO3 5ER**

MAIL ORDER ONLY

DRAGON & SHARP SOFTWARE

NEW FOR DRAGON — TEXT ON HIGH-RES. GRAPHICS!

A 2.5K sub-routine that produces text of all sizes and colours in any mode of high-res. graphics. Easy to use, allowing full use of inkeys, print at and numeric variables. **£7.95** Games Packs — 1, 2 & 3..... **£6.50** each. Adventure Games from..... **£3.00** Educational Software from..... **£4.00** Business Payroll **£15.00**, Stock Control **£15.00**, Mailing List **£15.00** Home Finance **£7.00** Tax Calculator **£4.00**. Many more programmes available — SAE for details.

Wanted: Oric, Dragon and Lynx programme. Cash or royalties paid.
Abacus Software, 20, Rhodleigh Ave, Sharpley Park, Bolton BL1 6PP. Tel: 0204-52726

SOFTWARE APPLICATIONS

MZ80K/A Horserace Analysis, winners galore. Cassette £5.75. Other Sharp Programs from £3.00. Details: PC Paragon "Moorside", Woodlands, Wimbourne, Dorset.

007 SPY. Lets you stop and copy any previously unstoppable Spectrum cassettes. On cassette £2.95. Bobker, 29 Chadderton Drive, Unsworth, Bury, Lancs.

UK101 SOFTWARE, full colour and sound. Any Mon. Any screen format. Send for list to Dept C, 70 Skirbeck Road, Boston, Lincs PE21 6DG.

MZ-80A MZ-80K PROGRAMS. Business, utility, games, educational. List SAE DCS, 38 South Parade, Bramhall, Stockport.

TOUCH TYPING

Tutor Cassettes for BBC A/B, Dragon 32 or (unexp.) Vic 20. The quick way to R.S.A. Stage III. Beginner or expert — it's for you. Touch typing is addictive!! Cassette **£4.95** (incl), state machine.

TECHNICAL EDUCATION
112 City Road, London EC1.

SOFTWARE EDUCATIONAL

POPPY PROGRAMS

For Young Children
**TELLING THE TIME
MONEY**
Two Fun Graphics Programs for
Spectrum (16K) on one
Cassette **£5.50** inc p&p



from **V. T. SAMPSON,**
Richmond House, Ingelton,
Carnforth, Lancs LA6 3AN

CLUBS/ USER GROUPS

DRAGON 32? THE SCOTTISH DRAGON CLUB

Welcomes new members. Send £8 for membership card, free games tape, newsletter etc. . . . to

**THE SCOTTISH
DRAGON CLUB, TF,
1 WALKER STREET,
EDINBURGH.**

LIBRARIES

FOR ALL YOUR. . . .

VIC 20 SOFTWARE

Unique offer! . . . Best Vic Software Library (Over 90 Top Titles!) Hire a cass or cart. for a week then, if you wish to buy it, keep it and send us the cost and we will **REFUND YOUR HIRE CHARGE!** If you decide not to keep it, simply return it and maybe try another of our wide range.

SO JOIN

* COMCLUB *

the club with a difference, today!
Membership fee now reduced to **£9.00**.
Cassette hire **£1.00**, cartridge hire **£3.00**.
PLUS: Special offers, comps and club magazine. Write **NOW!** to:

COMCLUB

24 Alton Rd, Aylestone, Leicester LE2 8QA
For **FREE CATALOGUE, MEMBERSHIP FORM, and YOUR FIRST ORDER FORM!**
REMEMBER. . . if it's good then we stock it!!!

SEND NO MONEY NOW

VIC 20

USERS SOFTWARE LIBRARY

- 6 reasons why you should join
- 1) Large selection of tapes.
 - 2) Membership fee only £10.00 for 2 years.
 - 3) Cassette hire £1.40 (inc p&p) per fortnight.
 - 4) Cartridge hire £2.50 (inc p&p) per fortnight.
 - 5) All tapes raffled free to members after 15 hires.
 - 6) All software hired with manufacturers permission.

Send membership fee on full money back approval or SAE for details to **VIC 20 USL, (Dept PCT), 11 Newark Road, Breadsall Estate, Derby DE2 4DJ.**



PERSONAL COMPUTING TODAY

CLASSIFIED ADVERTISEMENT — ORDER FORM

If you have something to sell now's your chance! Don't turn the page — turn to us!

Rates of charge: 35p per word per issue (minimum of 15 words). Please state classification

and post to **PERSONAL COMPUTING TODAY, CLASSIFIED DEPT.,**
145 CHARING CROSS ROAD, LONDON WC2.

			£5.25
			£7.00
			£8.75
			£10.50
			£12.25
			£14.00
			£15.75
			£17.50

Please place my advert in **PERSONAL COMPUTING TODAY** for issues commencing as soon as possible.

I am enclosing my Cheque/Postal Order/International Money Order for: (delete as necessary) £ (Made payable to A.S.P. Ltd)

Please use BLOCK CAPITALS and include pcst codes.



OR Debit my Access/Barclaycard
(Delete as necessary)



Name (Mr/Mrs/Miss/Ms)

Address

--	--	--	--	--	--	--	--	--	--	--	--

Signature..... **Date**.....

All classified advertisements must be paid for in advance.

Daytime Tel. No......

PLEASE MENTION PERSONAL COMPUTING TODAY WHEN REPLYING TO ADVERTISERS

<p>ACORN SOFT..... 33</p> <p>ANIROG COMPUTERS..... 14</p> <p>A B & C COMPUTING..... 60</p> <p>AKHTER INSTRUMENTS..... 25</p> <p>ARCADIA SOFTWARE..... 46</p> <p>ACORN PERIPHERALS..... 69</p> <p>BAMBY SOFTWARE..... 83</p> <p>BI-PAK..... 6</p> <p>BUFFER MICRO SHOP..... 11</p> <p>BYTEWELL..... 94</p> <p>CHEETAH MARKETING LTD..... 68</p> <p>COMPUSOUND..... 93</p> <p>COMPUTER HOUSE..... 53</p> <p>CASCADE..... 52</p> <p>CANDLEFORD..... 94</p> <p>CRL..... 42</p> <p>CARNELL SOFTWARE..... 13</p> <p>CASTLE ELECTRONICS..... IBC</p> <p>CAMEL MICROS..... 6</p> <p>CLWYD TECHNICS..... 11</p> <p>CLWYD PERSONAL COMPUTERS..... 77</p> <p>CLARES..... 83</p> <p>CAMBRIDGE COMPUTERS..... 107</p> <p>DISKING..... 109</p> <p>DA COMPUTERS LTD..... 6</p> <p>ELITE ELECTRONICS..... 76</p> <p>FROST SUPPLIES..... 83</p> <p>FOILKADE LTD..... 20</p> <p>GEM SOFTWARE..... 76</p> <p>GAMER..... 77</p> <p>GENERAL NORTHERN..... 20</p> <p>JRS SOFTWARE..... 93</p> <p>JCB MICROSYSTEMS..... 11</p> <p>LASERBUG..... 94</p> <p>LEVEL 9 COMPUTING..... 15</p> <p>MICRO MANIA..... 28</p>	<p>MR CHIP SOFTWARE..... 93</p> <p>MARKETING MICRO SOFTWARE..... 21</p> <p>MEMOTECH..... 34 & 35</p> <p>MICRO-DEAL..... 27</p> <p>MICRO-CELL COMPUTER SYSTEMS..... 29</p> <p>M. P. SOFTWARE..... 46</p> <p>MIJID..... 75</p> <p>NAMAL..... 15</p> <p>ORWIN SOFTWARE..... 46</p> <p>ORIC PRODUCTS..... 70 & 71</p> <p>PRO SOFTWARE..... 46</p> <p>PHEONIX PUBLISHING..... 76</p> <p>PLUS 80..... 56</p> <p>QUEST MICRO SOFTWARE..... 45</p> <p>RICHARD SHEPHERD..... 47</p> <p>REDSHIFT LTD..... 10</p> <p>REDDITCH ELECTRONICS..... 93</p> <p>READOUT/NEWTECH..... 7</p> <p>ROBERT CLEARY..... 94</p> <p>SPARTAN SOFTWARE..... 52</p> <p>STACK..... 11, 13, 15</p> <p>SIR COMPUTERS..... 19</p> <p>SOLAR SOFTWARE..... 18</p> <p>SWANLEY ELECTRONICS..... 77</p> <p>SOFT JOES..... HFC</p> <p>SILICA SHOP..... OBC</p> <p>SINCLAIR RESEARCH..... 61, 62, 63, 64</p> <p>THE DRAGON DUNGEON..... 28</p> <p>THORN EMI..... 54 & 55</p> <p>TERMINAL SOFTWARE..... 83</p> <p>THE SOFTWARE FARM..... 24</p> <p>3D COMPUTERS..... 24</p> <p>UTS..... 77</p> <p>ULTIMATE PLAY THE GAME..... 41</p> <p>VELTOMAX..... 18</p> <p>WINDRUSH..... 107</p>
---	---

Home Computer - Starter Packs

THE BEST PRICE & ADVICE FOR THE BEGINNER

COMMODORE 64

- 64k RAM ● 16 colours

★ Commodore 64 - £299.00

1541 Disk Drive - £299.99

1525 Printer - £230.00

Cassette Unit C2N - £44.95

Floppy Disks (Box 10) - £27.50

Free Commodore Cassette Player with every 64k

Starter Pack 64k + Disk Drive + Printer + Disks + Paper - £849.00



VIC 20

SUPER STARTER PACK

VIC 20 + C2N Cassette + Intro to Basic + 4 Cassette Games (Blitz, Hoppit, Race, Strategic Advance).

Current RRP £249.99

SPECIAL PRICE - £139.95

1540 Disk Drive - £299.00, 1525 Printer - £230.00, Cassette Unit C2N - £44.95, Also available - extra RAM, hi-res cartridge Joysticks, Paddles.

BBC

BBC Model A - 16k - £299.00

BBC Model A - 32k - £349.00

BBC Model B - £399.00

Upgrade A to B - £95.00

Cassette - £29.95

Disk S/S 100k - £265.00

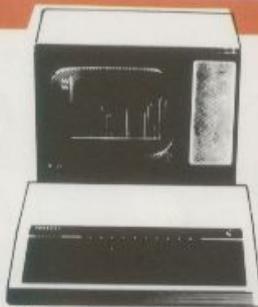
Disk Interface - £100.00

Dual Disk 800K - £829.00

Disk TEAC single - £199.00

Disk TEAC twin - £399.00

1.2k ROM - £11.50



Microvitec 14" Colour RGB TTL - £299.00

Also Available - BBC Econet system

ALL PRICES INCLUDE VAT

SINCLAIR

ZX81 - £39.95

Power Supply - £9.95



ZX Printer - £39.95 16k RAM - £29.95

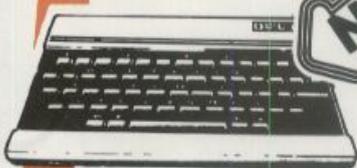
ZX Spectrum 16k - £99.95

ZX Spectrum 48k - £129.95

Cassette - £29.95 Paper (5 rolls) - £11.95

HUGE SELECTION OF GAMES, CASSETTES, BOOKS FOR ALL MACHINES

ORIC1

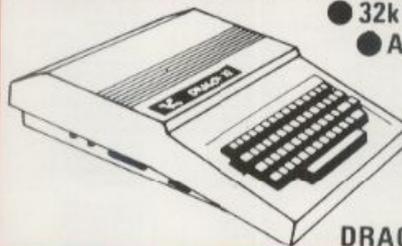


- 8 Colours
- 40x28 or 240x200 display
- 96 User Graphics
- 6 Sound octaves

★ ORIC 48K - £169.95 ★

DRAGON

- 6809E Processor
- 32k RAM
- Advanced Graphics and Sound
- 9 Colours
- Professional Quality Keyboard



DRAGON 32k - £169.95

FULL RANGE OF PRINTERS, MONITORS, JOYSTICKS, PERIPHERALS & STATIONERY

ATARI

AM 400 - £159.00

AM 800 - £399.00

Cassette Deck - £49.95 Disk Drive - £299.00

Basic - £39.95 Thermal Printer - £199.00

Starter Pack 1

AM400 + Cassette + 10xC12 - £199.00

Starter Pack 2

AM400 + Cassette + Basic + 10xC12 - £239.00

EXPORT

SINGLE or QUANTITY EXPORT orders welcome. NO VAT. Experience of exports worldwide - full documentation.

TERMS. U.K. - Payment with Order.

Overseas - Cheque in sterling drawn on British Bank. Carriage. Please check for carriage.

CASTLE ELECTRONICS

(0424) 437875

CASTLE ELECTRONICS Dept.PCT.
7 CASTLE STREET, HASTINGS, E.SUSSEX

Our Sister Company SOUTH EAST COMPUTERS, is No.1 in the South for Business Systems

100 FREE PROGRAMS

FROM SILICA SHOP — WITH EVERY PURCHASE OF AN

ATARI 400/800



ATARI PRICES REDUCED!
 We at Silica Shop are pleased to announce some fantastic reductions in the prices of the Atari 400/800 personal computers. We believe that the Atari at its new price will become the U.K.'s most popular personal computer and have therefore set up the Silica Atari Users Club. This club already has a library of over 500 programs and with your purchase of a 400 or 800 computer we will give you the first 100 free of charge. There are also over 350 professionally written games and utility programs, some are listed below. Complete the reply coupon and we'll send you full details. Alternatively give us a ring on 01-301 1111 or 01-309 1111.

- ATARI 400 with 16K** **£149**
- ATARI 400 with 32K** **£198**
- ATARI 800 with 16K** **£299**

400/800 SOFTWARE & PERIPHERALS

Don't buy a T.V. game! Buy an Atari 400 personal computer and a game cartridge and that's all you'll need. Later on you can buy the Basic Programming cartridge (£35) and try your hand at programming using the easy to learn BASIC language. Or if you are interested in business applications, you can buy the Atari 800 + Disk Drive + Printer together with a selection of business packages. Silica Shop have put together a full catalogue and price list giving details of all the peripherals as well as the extensive range of software that is now available for the Atari 400/800. The Atari is now one of the best supported personal computers. Send NOW for Silica Shop's catalogue and price list as well as details on our users club.

THE FOLLOWING IS JUST A SMALL SELECTION FROM THE RANGE OF ITEMS AVAILABLE:

<p>ACCESSORIES</p> <ul style="list-style-type: none"> Cables Cassettes Diskettes Joysticks Le Stick - Joystick Misc Supplies Paddles <p>ADVENTURE INT</p> <ul style="list-style-type: none"> Scott Adams Adv No 1 Adventureland No 2 Pirate Adv No 3 Mission Imp No 4 Woodoo Cast No 5 The Count No 6 Strange Ody No 7 Mystery Fun No 8 Pyramid of D No 9 Ghost Town No 10 Sav Island 1 No 11 Sav Island 2 No 12 Golden Voy Angle Worms Deflections Galactic Empire Galactic Trader Lunar Lander 	<p>MOUNTAIN SHOOT</p> <ul style="list-style-type: none"> Rearguard Star Flite Sunday Golf <p>AUTOMATED SIMULATIONS</p> <ul style="list-style-type: none"> Crush Crumble Cmp Datestones of Hyn Dragons Eye Invasion Orion Rescue at Rigel Ricochet Star Warrior Temple of Apsah Upper Reaches Aps <p>BOOKS</p> <ul style="list-style-type: none"> Basic Ref Manual Compute Atari DOS Compute Bk Atari Compute Magazine De Re Atari DOS2 Manual Misc Atari Books Op System Listing Wiley Manual <p>CRYSTALWARE</p> <ul style="list-style-type: none"> Beneath The Pyramid Fantasyland 2041 Galactic Quest House Of Usher Sands Of Mars Waterloo World War III 	<p>BUSINESS</p> <ul style="list-style-type: none"> Calculator Database Management Decision Maker Graph-It Invoicing Librarian Mort & Loan Anal Nominal Ledger Payroll Personal Finl Mgmt Purchase Ledger Sales Ledger Statistics 1 Stock Control Telemark 1 Vissical Weekly Planner Word Processor <p>DYNACOMP</p> <ul style="list-style-type: none"> Alpha Fighter Chompeb Crystals Forest Fire Intruder Alert Monarch Moonprobe Moving Maze Nominors Jigsaw Rings Of The Emp Space Tft Space Trap Stud Poter Triple Bockade <p>EDUCATION</p> <ul style="list-style-type: none"> from APX Alpicalc Atlas of Canada Cubbyholes Elementary Biology Frogmaster Hickory Dickory Inst. Comptg Dem Lemonade Letterman Mapview <p>EDUCATION</p> <ul style="list-style-type: none"> from ATARI Conv French Com-German Cr - Italian Cr - Spanish Energy Czar European C & Caps Hangman Invt To Prog 1/2/3 Kingdom Music Composer <p>Maths-Tac-Toe</p> <ul style="list-style-type: none"> Metric & Prob Solvg Mugump Music Terms/Notatn British Heritage Cribbage/Dominos Darts European Scene Jig Hickory Dickory Humpty Dumpty Jumbo Jet Lander Snooker & Billiards Submarine Comindr Super Cubes & Tilt Tournament Pool <p>EMU SOFTWARE</p> <ul style="list-style-type: none"> My First Alphabet Number Blast Polycalc Presidents Of U.S. Quiz Master Starware Stereo 3D Graphics Three R Math Sys Video Math Flash Wordmaker <p>ENTERTAINMENT</p> <ul style="list-style-type: none"> from APX Alien Egg Amthill Attank Avalanche Babel Blackjack Casino Block Buster Block Em Bumper Pool <p>Castle</p> <ul style="list-style-type: none"> Centurion Checker King Chinese Puzzle Codecracker Comedy Diskette Dice Poker Dog Daze Domination Downhill Eastern Front Galahad & Holy Gri Graphics/Sound Jax-O Jukebox Lockwood Memory Match Midas Touch Minotaur Outlaw Howitzer Pac Man Space Invaders Star Raiders Super Breakout Video Ease! <p>ON LINE SYSTEMS</p> <ul style="list-style-type: none"> Crossfire Frogger 	<p>Castle</p> <ul style="list-style-type: none"> Centurion Checker King Chinese Puzzle Codecracker Comedy Diskette Dice Poker Dog Daze Domination Downhill Eastern Front Galahad & Holy Gri Graphics/Sound Jax-O Jukebox Lockwood Memory Match Midas Touch Minotaur Outlaw Howitzer Pac Man Space Invaders Star Raiders Super Breakout Video Ease! <p>ON LINE SYSTEMS</p> <ul style="list-style-type: none"> Crossfire Frogger <p>Sleazy Adventure</p> <ul style="list-style-type: none"> Solitaire Space Chase Space Trek Sultans Palace Tact Trick Terry Wizards Gold Wizards Revenge <p>ENTERTAINMENT</p> <ul style="list-style-type: none"> from ATARI Asteroids Basketball Blackjack Conspide Chess Entertainment Kit Missile Command Pac Man Space Invaders Star Raiders Super Breakout Video Ease! <p>ON LINE SYSTEMS</p> <ul style="list-style-type: none"> Crossfire Frogger 	<p>Jawbreaker</p> <ul style="list-style-type: none"> Mission Asteroid Mouskattack Threshold Ulysses/Golden Fl Wizard & Princess <p>PERIPHERALS</p> <ul style="list-style-type: none"> Centronics Printers Disk Drive Epson Printers Program Recorder RS232 Interface Thestral Printer 16K Memory RAM 32K Memory RAM <p>PERSONAL INT</p> <ul style="list-style-type: none"> from APX Adv Music System Banner Generator Blackjack Tutor Going To The Dogs Keyboard Organ Morse Code Tutor Personal Fitness Pro Player Piano Skatepad <p>SILICA CLUB</p> <ul style="list-style-type: none"> Over 500 programs write for details
---	---	--	---	---

FOR FREE BROCHURES - TEL: 01-301 1111

FREE LITERATURE

I am interested in purchasing an Atari 400/800 computer and would like to receive copies of your brochure and test reports as well as your price list covering all of the available Hardware and Software.

Name.....

Address.....

Postcode.....

PCT 883 - Personal Computing Today -



For free brochure and details on our range of electronic products, please telephone 01-301 1111. To order by telephone, send your name, address, credit card number and order requirements and we'll send you a free brochure and price list FREE OF CHARGE in the UK. Express 24 hour delivery available for additional charge.

SEND YOUR ORDER TO: SILICA SHOP, 1-4 THE MEWS, HATHERLEY ROAD, SIDCUP, KENT DA14 4DX. TEL: 01-301 1111.

- **WARRANTY:** All goods are guaranteed for 12 months.
- **RETURN POLICY:** If you are not satisfied with your purchase you may return it to us within 14 days. On receipt of the goods in satisfactory condition we will give you a full refund.
- **EXCHANGE:** We offer a special 14 day exchange policy on all goods.
- **COMPUTER PARTS:** We offer a special 14 day exchange policy on all computer parts.
- **COMPUTER SOFTWARE:** All software is guaranteed to be error free.
- **COMPUTER ADVICE:** Available on the usability of various computers.
- **AFTER SALES SERVICE:** Available on all computers out of guarantee.
- **VAT:** All prices quoted above include VAT at 17%.
- **CREDIT FACILITIES:** An offer of credit over 12, 24 or 36 months, please ask for details.

SILICA SHOP LIMITED
 Dept PCT 883, 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX Telephone 01.301 1111 or 01-309 1111