AN ARGUS SPECIALIST PUBLICATION

Personal Computing Today

AUGUST 1983

75p

Add-on Action Inside

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

Soft Joe's Software

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.



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!

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

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)

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.

ABC

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.

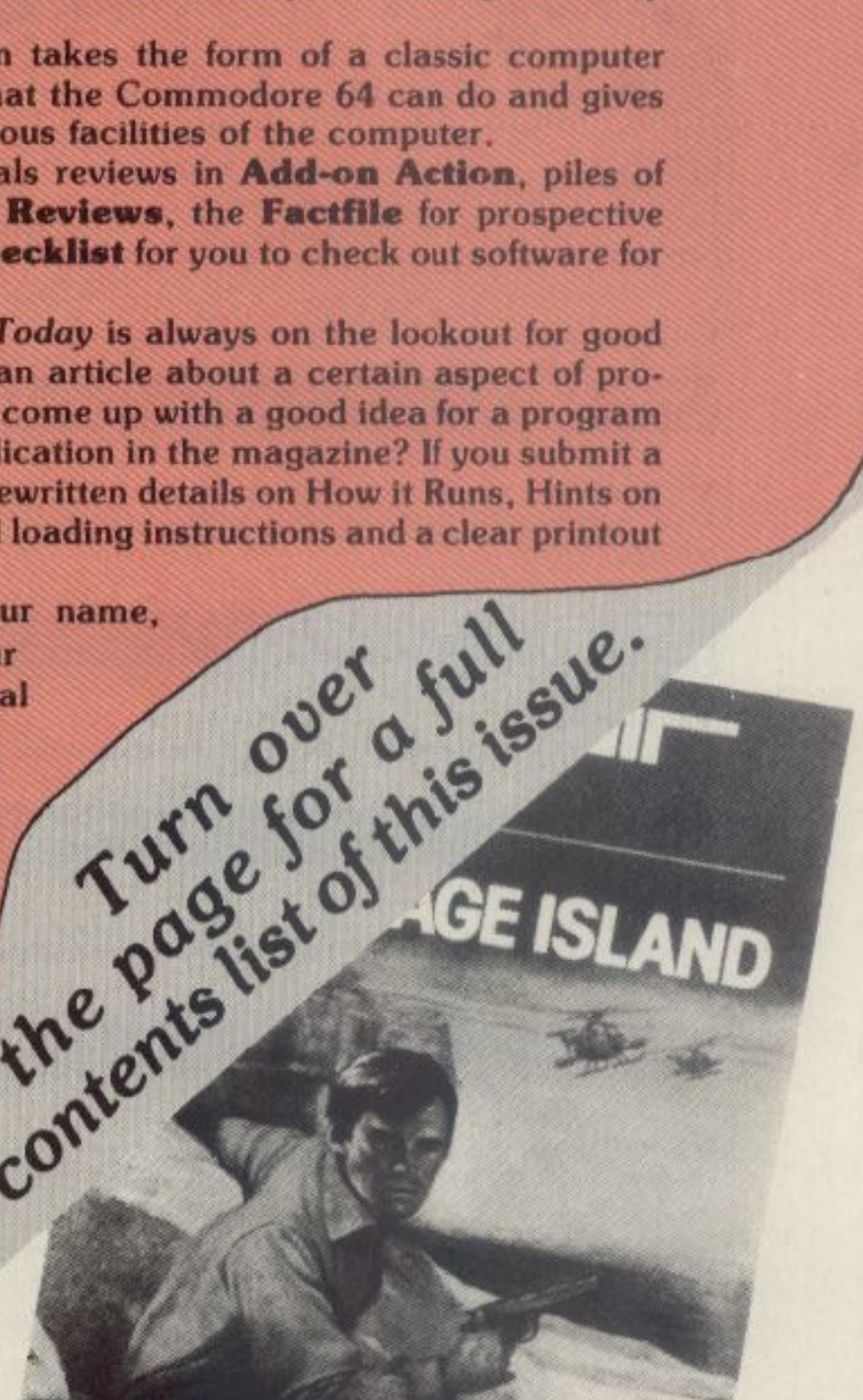
Our first Commodore 64 program takes the form of a classic computer game, **Grand Prix**. This shows just what the Commodore 64 can do and gives users a good opportunity to try out various facilities of the computer.

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.

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



CONTENTS

AUGUST

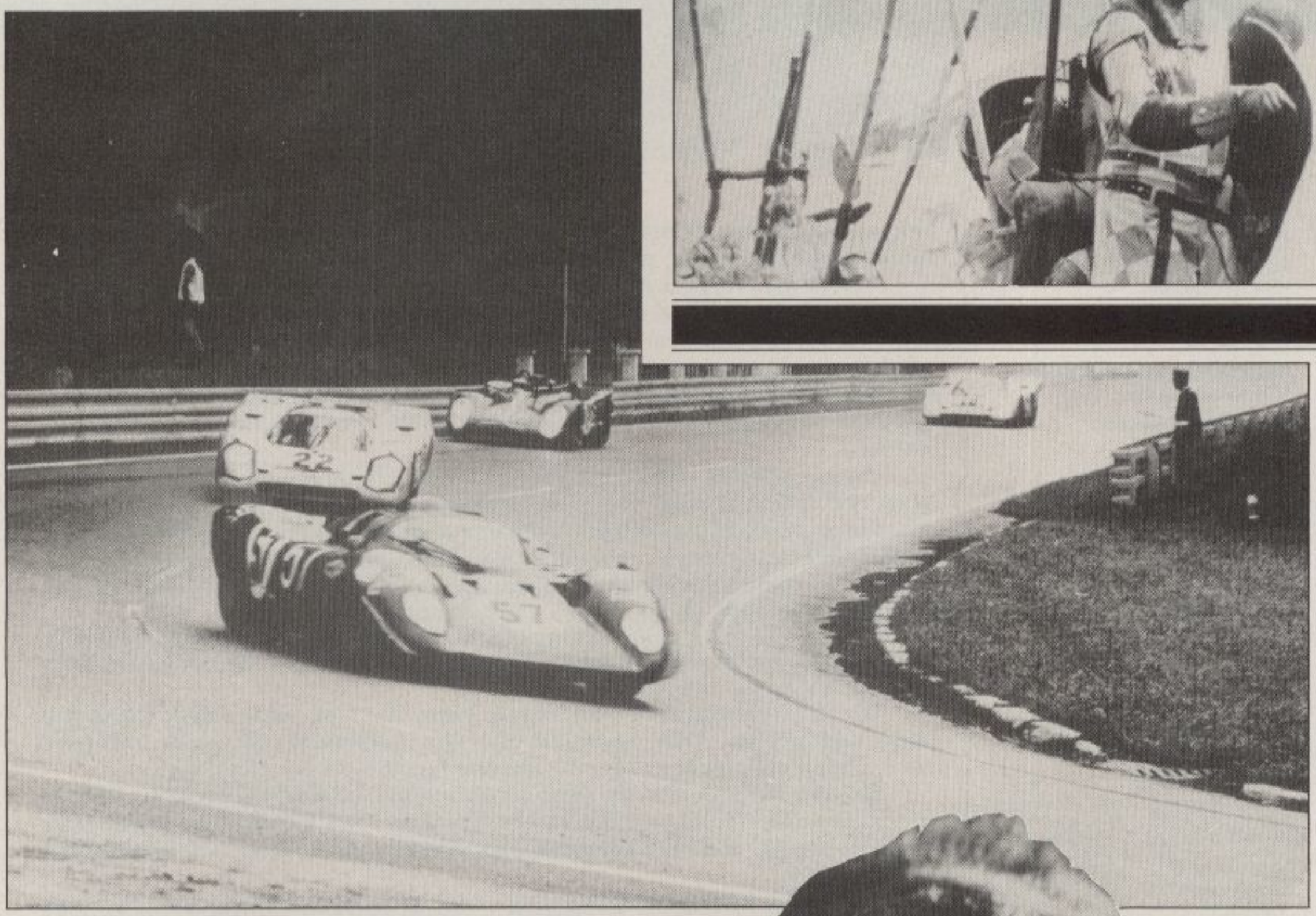
NEWS

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.

1983 CONTENTS



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.



BBC SOFTWARE

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

REFERENCE

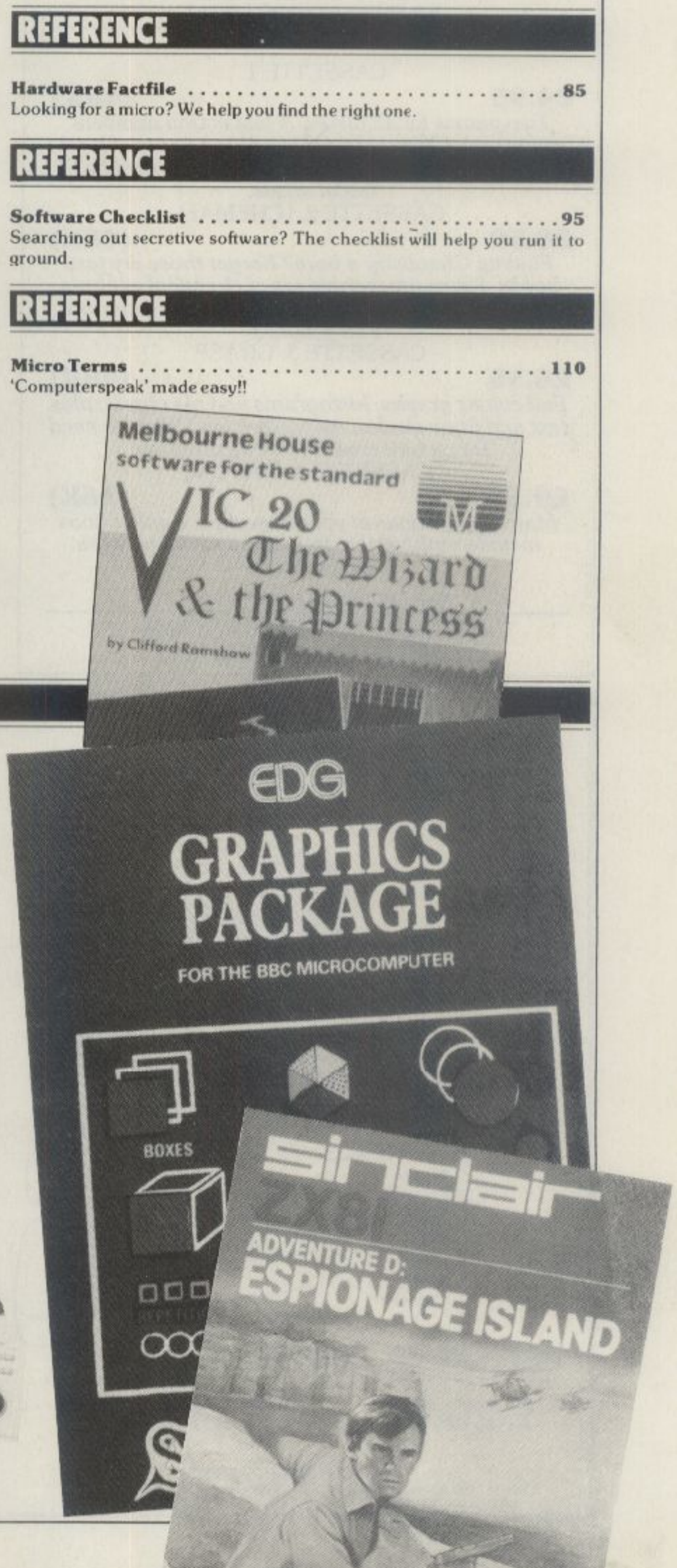
Hardware Factfile 85
Looking for a micro? We help you find the right one.

REFERENCE

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

REFERENCE

Micro Terms 110
'Computerspeak' made easy!!



SPECTRUM

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)**

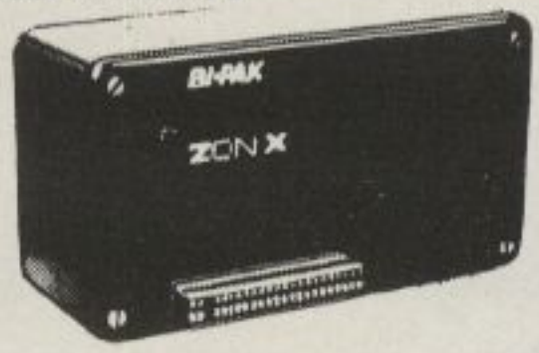
Matrix operations at your fingertips. Applications include multivariate trend prediction, network analysis etc.

★ ★ *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 loudspeaker.
- 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

PCT88

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.)

- ☐ Learning to Use the PET Computer
- ☐ Learning to Use the BBC Microcomputer
- ☐ Learning to Use the ZX Spectrum
- ☐ Learning to Use the Apple II / IIE
- ☐ Learning to Use the Commodore 64
- ☐ Learning to Use the VIC-20 Computer
- ☐ Learning to Use the ZX81 Computer
- ☐ Learning to Use the Dragon 32
- ☐ Learning to Use the TI 99/4a

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)

- ☐ Learning to Use the Oric 1
- ☐ 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 entrepeneur, 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 knowlege 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.

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.



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 unfortunately 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.

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.

? RED SHIFT

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, boarcgames, 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 membership 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
Computer Services Limited

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

TECHNEG CLWYD TECHNICS LTD

CT 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

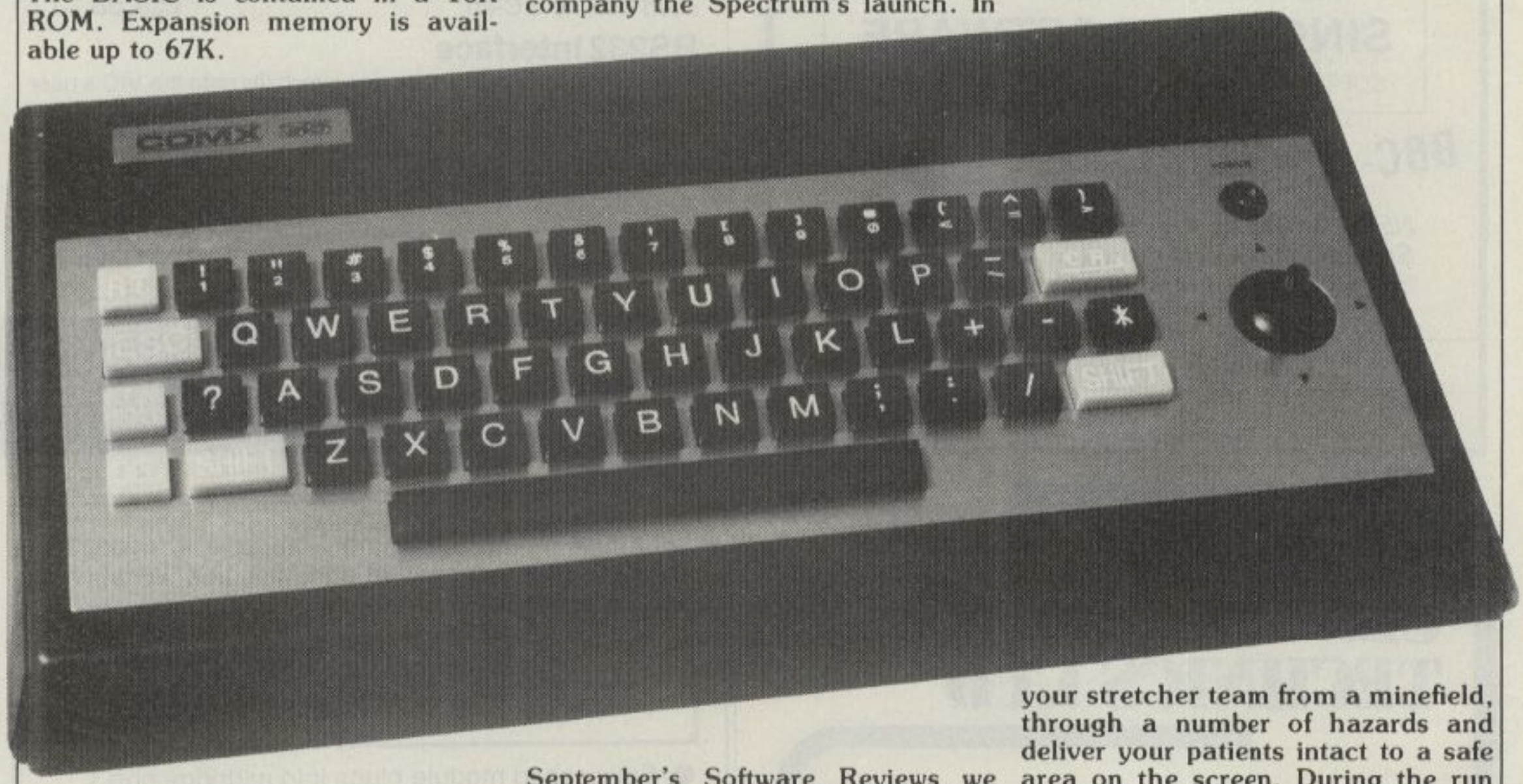
ONLY
£34.95
inclusive

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.



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

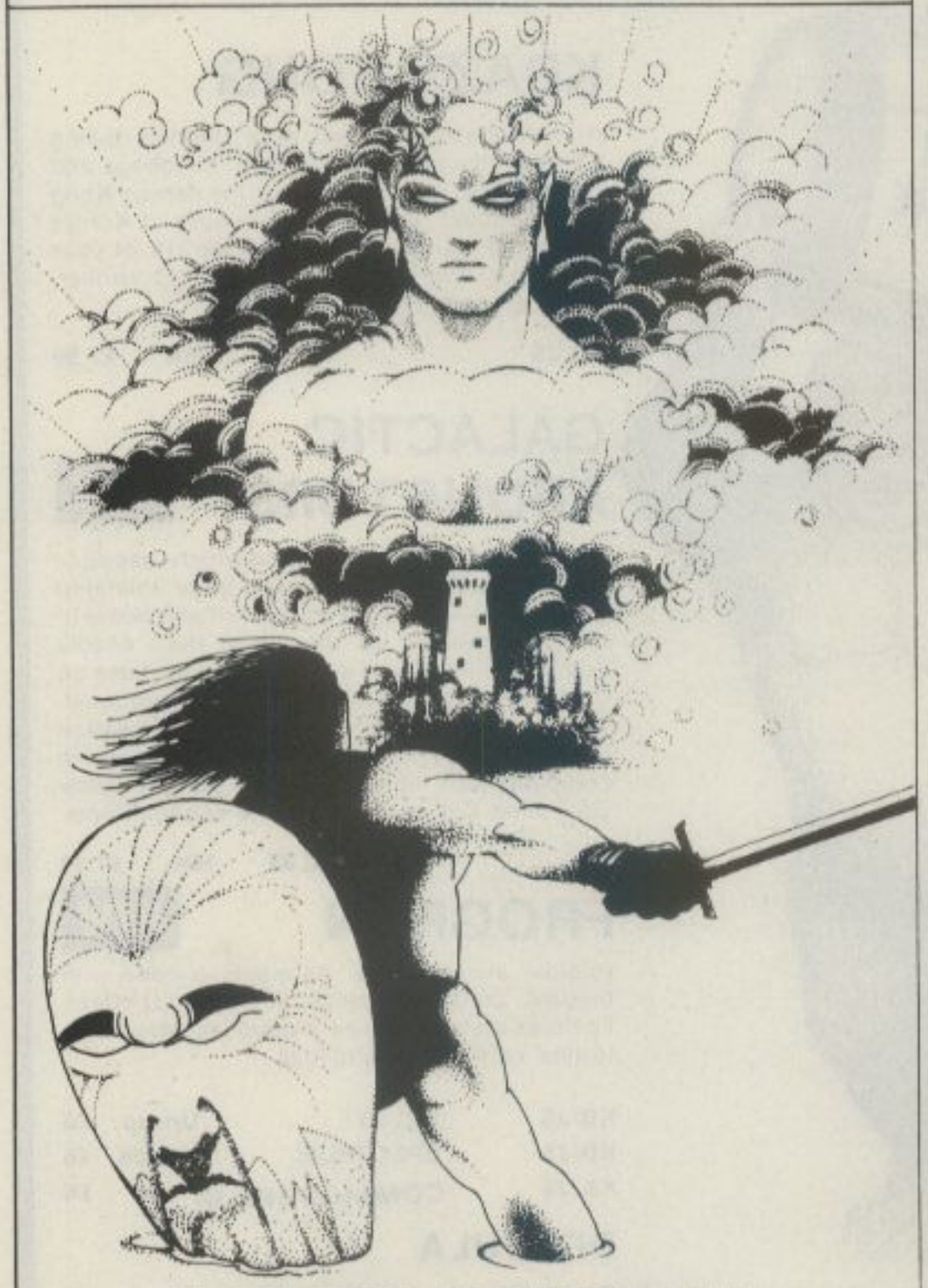
Please reserve me a regular copy of
Personal Computing Today

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

CARNELL SOFTWARE

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

☐ Spectrum 48K..... £7.50
☐ ZX8 16K..... £7.50

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

NAME.....

ADDRESS.....

.....

TRADE ENQUIRIES WELCOME



HaveYOU 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 8k 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 pop 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 VICKIT 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
Computer Services Limited

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

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

BARCLAYCARD VISA

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

Name _____ Address _____

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

ANIROG SOFTWARE

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 tortucus 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**



DOTMAN

Ghosts chase you as you try to eat the dots and collect points. You can turn the tables on them by eating the pills. Don't forget the ghosts have been given intelligence and will try to corner you. This feature makes Dotman exciting and challenging. All M/C game complete with running and highest scores and tunnels.

JS/KB **VIC 20** **Unexp.** **£6.00**

ZOK'S KINGDOM

Your starcruiser badly damaged in a meteor storm is forced to crash land on the planet ruled by ZOK, a time space generated image of Dracula. You are challenged to a battle of wits and endurance as the battle for survival starts in earnest in this big multi-screen graphical adventure in hi-res graphics and M/C movements.

KB/JS **VIC 20** **16K** **£6**

KRAZY KONG

An E-XPANDE-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**

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.

BARCLAYCARD VISA

AR

Access

24 HR. CREDIT CARD SALES HORLEY (02934) 6083

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



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 acventure has over 200 individually described locations and is packed with puzzles – a game can easily take months to complete. Only sophisticated ccmpression 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 Compu:ing 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

4 SLOT MOTHERBOARD

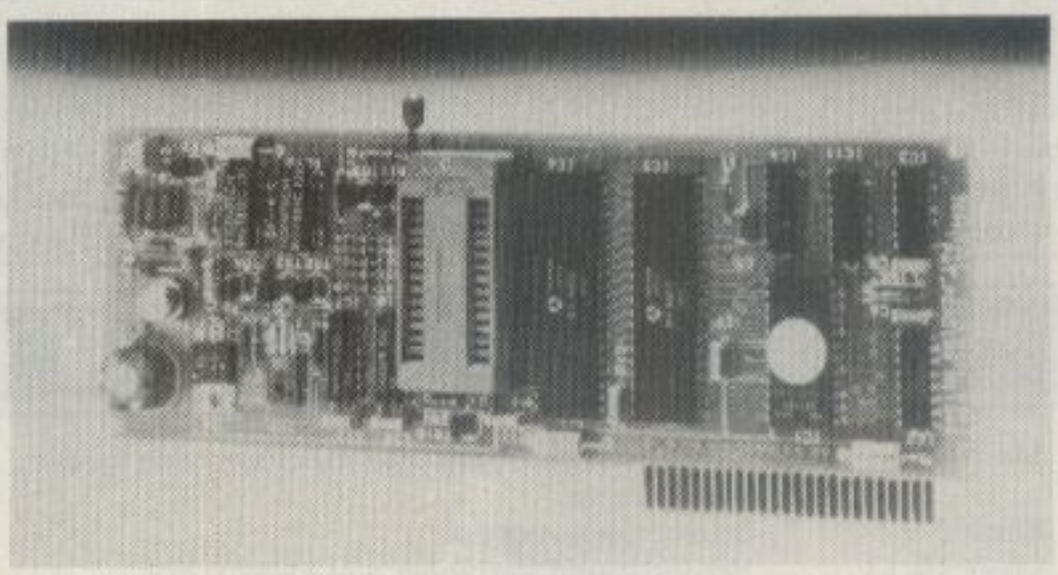


USE UP TO 4 CARTRIDGES AT THE SAME TIME!

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)



Try the Apple Cards from Namal!

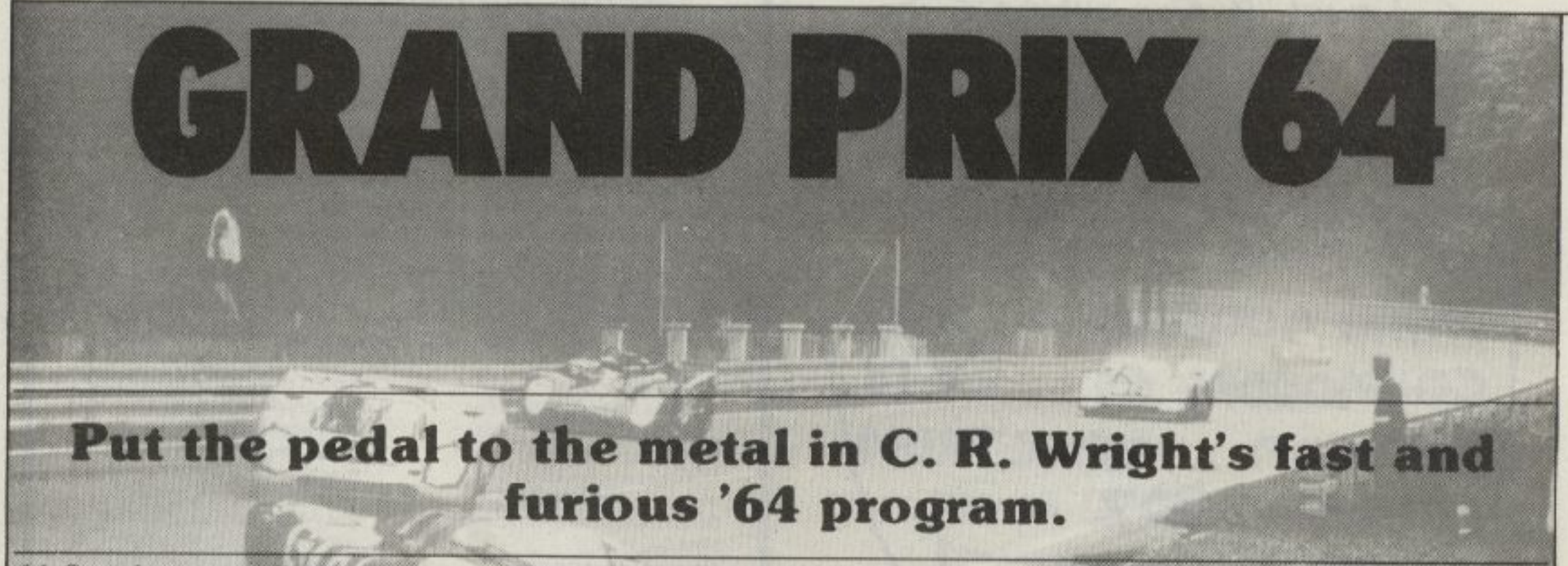
Pictured above is the new Romblo 1248, an EPROM blower for the Apple Microcomputer. It will programme all 25 and 27 series EPROMS and has its own on-board software, so that it does not require expensive disk drives and it speeds up operation.

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

VARIABLES USED

HS	High score
A$	General purpose input
SN	Start address of SID chip
HN	High frequency POKE address
WV	Waveform POKE address
CL$ (1-4)	Colour variables
K	Same as I
L	Same as A & delay time
PL	Colour screen POKE address
D	Random number generator
Z	Delay variable
TR$ (1-17)	Track variables
S	Score or number of postions moved
LN	Low frequency POKE address
VL	Volume POKE address
AD	Attack/decay POKE address
I	General purpose loops/delays
A	Used for keyboard input values
PC	Character screen POKE address
TA	Tabulation Value of track
F,E and T	Tabulate variables
LE	Scaling-up factor of score
E	Also used to load machine code
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$(8):HS=0:DIMTR$(17)
5 PRINT"■■■■■■■■■■■■■■■DO YOU REQUIRE INSTRUCTIONS (Y OR N)"
6 GETA$:IFA$=""THEN6
7 IFA$="N"THEN10
8 IFA$="Y"THEN1000
9 GOTO6
10 PRINT"■";S=0
12 SN=54272:LN=SN:HN=SN+1:VL=SN+24:WV=SN+4:AD=SN+5
13 REM-INITIAL SETUP AND MAIN START LOGO
20 CL$(1)="■":CL$(2)="■":CL$(3)="■":CL$(4)="■"
25 FORI=1TO4:PRINTCL$(I);:GOSUB20:PRINT:NEXT:GOTO90
30 PRINT"   ■■■ ■■■  ■   ■ ■ ■■■ ■■■ ■■■ ■ ■ ■"
40 PRINT"   ■   ■ ■ ■ ■ ■■  ■ ■ ■ ■ ■ ■ ■ ■ ■ ■"
50 PRINT"   ■ ■ ■■■ ■■■ ■■■ ■ ■ ■■■ ■■■  ■  ■"
60 PRINT"   ■ ■ ■ ■ ■ ■ ■   ■ ■ ■ ■   ■ ■ ■ ■ ■"
70 PRINT"   ■■  ■ ■ ■ ■ ■ ■ ■■■ ■   ■ ■ ■ ■ ■■"
80 RETURN
90 PRINT"■";
100 PRINT"■■■■■■■■";
105 PRINT"■■■■■■■■■■■■■■■                    '
110 PRINT"■■■■■■■■■■■■■■■ BY C.R.WRIGHT '
115 PRINT"■■■■■■■■■■■■■■■                    '
120 PRINT"■■■■";
130 FORK=1TO3:PRINT"■■■■■■■■■■■■■                              ' NEXT
140 PRINT"I";
150 MS$="■■■■■■■■■■■■■ A @COMPUTERS GAME '
155 PRINT"■";
160 FORK=1TOLEN(MS$):PRINTMID$(MS$,K,1);:FORI=1TO30:NEXT:NEXT:PRINT
170 PRINT"■■■■■■■■■■";
180 PRINT"          ■ PRESS ANY KEY TO BEGIN■";
190 A=PEEK(197):IFA=64THEN190
199 REM-LEVEL SELECT
200 PRINT"■"
201 PRINT"■■■■■■■SELECT LEVEL :-"
202 PRINT"I■■■■■■■■ TOO EASY FOR THE NOVICE"
203 PRINT"■■■■■■■2 VERY EASY"
204 PRINT"■■■■■■■3 EASIER FOR THE BEGINNER"
205 PRINT"■■■■■■■4 SLIGHTLY EASIER"
206 PRINT"■■■■■■■5 FOR AVERAGE PLAYERS"
207 PRINT"■■■■■■■6 FOR THE ABOVE AVERAGE"
208 PRINT"■■■■■■■7 STILL HARD"
209 PRINT"■■■■■■■8 NEARLY AS HARD AS LEVEL 9"
210 PRINT"■■■■■■■9 VERY HARD FOR THE EXPERT"
211 L=PEEK(197):IFL=64THEN211
212 IFL=56ORL=59ORL=8ORL=11ORL=16ORL=19ORL=24ORL=27ORL=32THEN214
213 GOTO211
214 GOSUB4500:POKEAD,240
215 PRINT"■":PC=1024+20:PL=55296+20
216 REM-MORE SETUP ROUTINES
217 FORK=1TO13:TR$(K)="■↓■■■■■■■■■■■■■■■
```



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, swarmers, 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, Breakout, 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 Hillery 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**

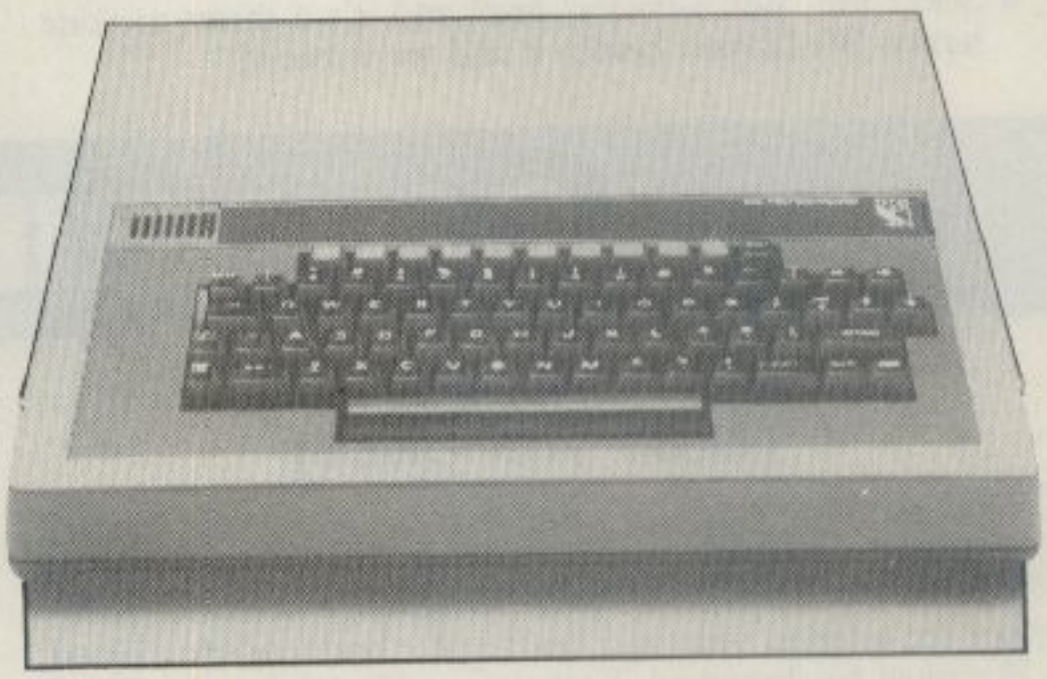
SPARTAN SOFTWARE
(DEPT. PCT)
9 Cotswold Terrace,
Chipping Norton,
Oxon.

25 SUPERB GAMES ONLY £8.95!



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 × 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.

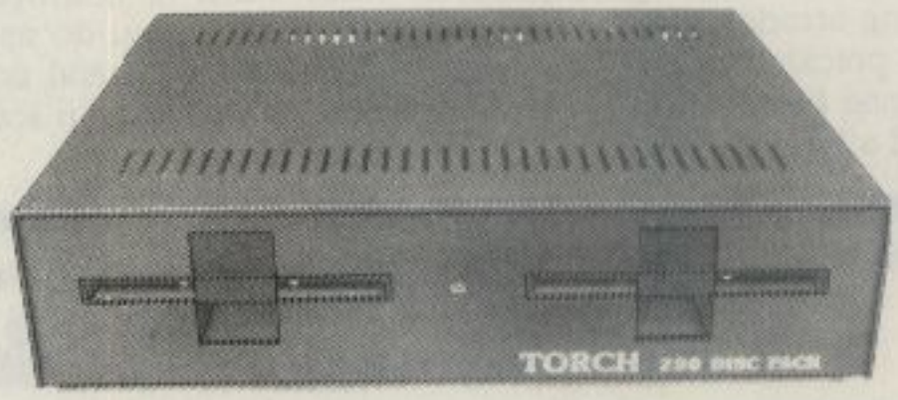
In addition to the disc pack a second processor is supplied. This is a Z-80A with its own 64K RAM card, communicating with the 6502A in the BBC computer through the 'Tube'. Typically the speed of execution of programs under the twin-processor system is increased by up to 50% compared with a conventional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

Seikosha 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

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!

ZX81 16K

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 'Foilkade 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)

AMERICAN EXPRESS

BARCLAYCARD VISA

"It's about time you started work my lad!"



"All the money I've spent on you, young Vic. And all you do is sit around all day playing games."

"Well it's about time you started earning your keep like a big computer."

"With the help of PractiCalc you could give me a hand with the household budgets, business accounts, and even the work I bring home from the office."

"You could also help me work out cash-flow problems, choose the best life assurance policy, and decide whether it's best to pay for my double-glazing now with a loan, or to wait for a few more months."

"In fact PractiCalc would allow you to do in seconds, the kind of repetitive calculations that would take hours with a pencil and paper or pocket calculator."

"And do it for just £24.95."

"It really is about time you took your computing seriously."

PRACTICALC. THE SPREADSHEET FOR 16K VIC 20.

Also available for Commodore 64. (And soon from all good software dealers.)

"JUST YOU FILL THIS IN AND SEND IT OFF RIGHT NOW!"

OR SEND FOR FULL PROGRAM DETAILS
From MMS, Goddard Road, Whitehouse Industrial Estate, Ipswich, Suffolk, IP1 5NP.
Tel. No. 0473 462721. Co. Reg. No. 1694320.

Send this coupon to: Marketing Micro Software Ltd., FREEPOST, Ipswich IP1 5BR.

QTY	PROGRAM	PRICE (UK)	TOTAL
	PractiCalc for 16K Vic 20 Cassette	£24.95	
	PractiCalc for 16K Vic 20 Disc	£29.95	
	TOTAL (Please add 50p P&P)		

FREEPOST – No stamp needed in UK.
I enclose a cheque/postal order payable to: Marketing Micro Software Ltd.
£ _____

OR Please charge to my Access, Visa, Diners, or American Express card: PCT8

_____

Signature _____
PLEASE USE BLOCK CAPITALS
Name _____
Address _____

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.

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

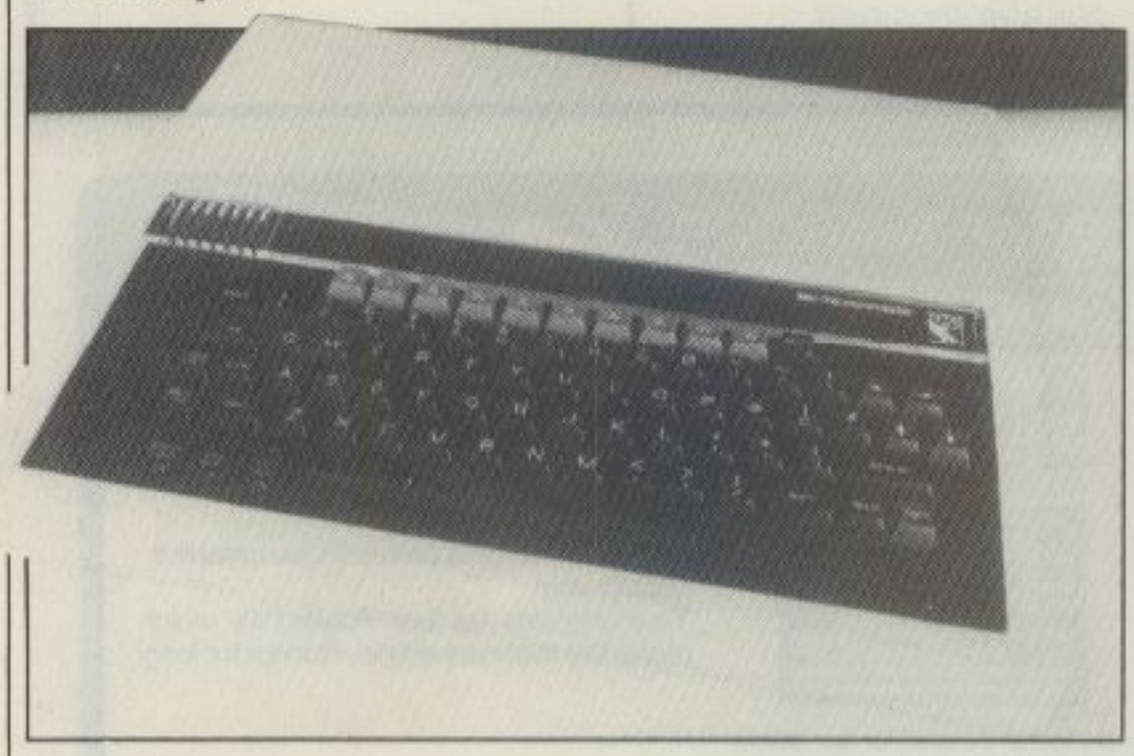
Dear Sir,
I would support John Ryden's letter praising Commodore. (May 1983). My VIC-20 developed a fault, preventing the use of a light pen. This was attended to by Commodore but I unfortunately had to return the VIC again because the fault persisted. Without any quibble the service section exchanged 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 anouncing 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 overrated. Others are saying that is 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 brillant, 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 underestimating 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 advertisements 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, Surbiton, 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

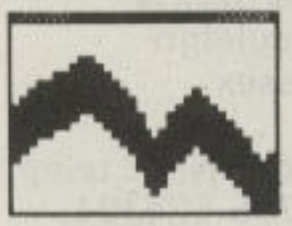
NEWBURY
26 Stanley Road, Newbury, Berks RG14 7PB
Tel: 0635 30047

An Exciting range for 16K ZX81 from SOFTWARE FARM

SUPER SCRAMBLE

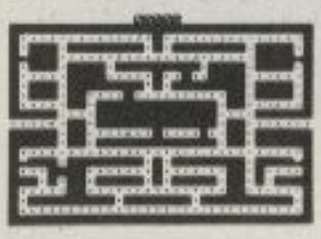
YOUR MISSION
To penetrate the witches defences, enter her cavern and destroy her wicked heart.

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!

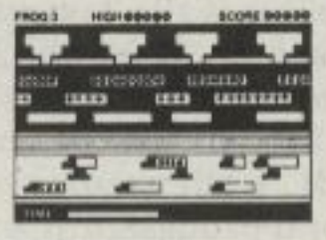
ASTEROIDS

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



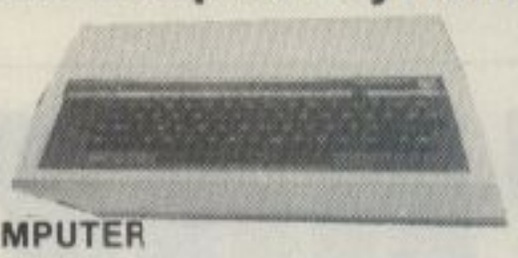
- 50 Skill levels!
- Played against the clock - froggie only has a short while to live!

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 800K Dual Disk Drive	£699 + VAT =	**£803.85**
Torch Light Pen for BBC Micro	£65 + 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**

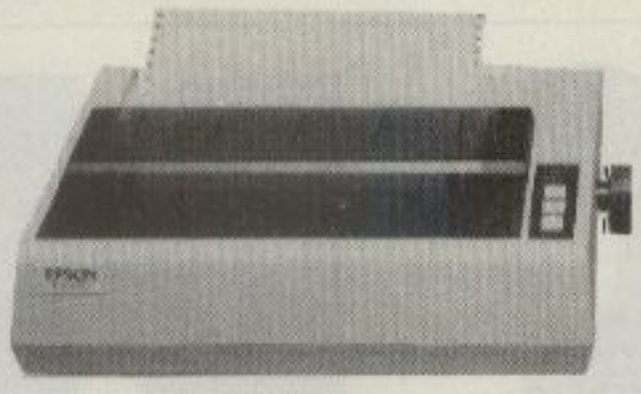
100% BBC COMPATIBLE MITSUBISHI SLIMLINE DISK DRIVES

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 =	**£516.35**
Single 400K switchable 40/80 tracks	£249 + VAT =	**£286.85**

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

EPSON FOR RELIABILITY



EPSON FX80: 80 column, 160 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 8 dots/line), friction and pinfeed, 9 international characte' 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 = **£297.85**

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.

DRAGON 32



A powerful computer specialy 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**
FRICTION 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**

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 anguages such as PASCAL, C, BCPL, FORTRAN, LISP ard 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**

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 holders 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 block 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
SPECIAL PRICE ..... £269 + VAT = **£309.35**
STAR DP515 15" Carriage 136 Columns
SPECIAL PRICE ..... £369 + VAT = **£424.35**
RS232 INTERFACE FOR ABOVE ..... £50 + VAT = **£57.50**

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 = £149.95

PLEASE PHONE FOR FURTHER DETAILS ON THESE ITEMS

CASIO POCKET COMPUTERS

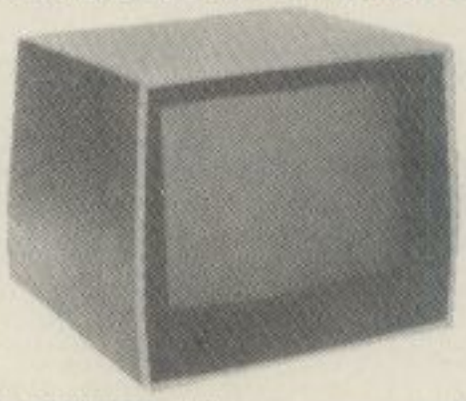


CASIO FX-802P: Pocket computer with scientific function and built-in mini computer, uses BASIC language. 1568 program steps. QWERTY keyboard. 12 char. display.
FX802P ..... £ .

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
FA-3 Price ..... £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**

PROFESSIONAL MONITORS

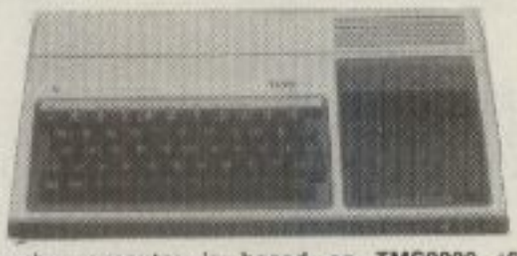


GREEN MONITORS 12" green screen monitors with composite and sync. input. Suitable for most computers.
18 MHZ Bandwidth High Resolution .. £89 + VAT = **£102.35**
15 MHZ Bandwidth Normal Resolution £69 + VAT = **£79.35**

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**

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).

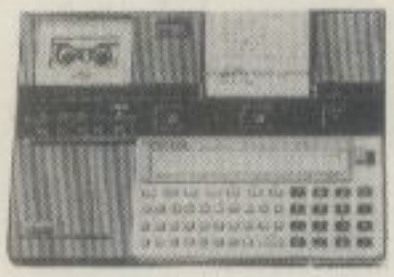
TI Home Computer & Cass Lead	**£130.40 + VAT = £149.95**
Peripheral Expansion System	£126.04 + VAT = **£144.95**
Disk Controller Card	**£130.40 + VAT = £149.95**
Singe Disk Drive	£173.87 + VAT = **£199.95**
Speech Synthesizer	£36.48 + VAT = **£41.95**

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 6 software modules before 2nd July 83 TEXAS INSTRUMENTS will supply FREE speech synthesizer.

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

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

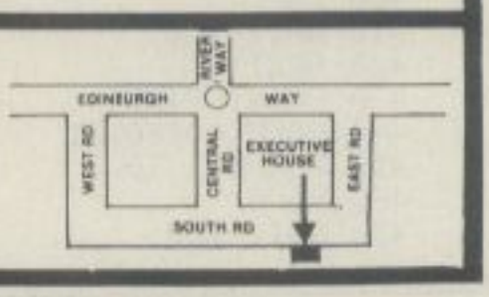


New pocket computer with 24K Bytes System ROM, 4K RAM, BASIC LANGUAGE, 24 character liquid crystal display, QWERTY keyboard + numeric pad + user defined keys, 24 column Thermal printer, Microcassette recorder for data storage, battery charger and demonstration cassette supplied in an attractive case.
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

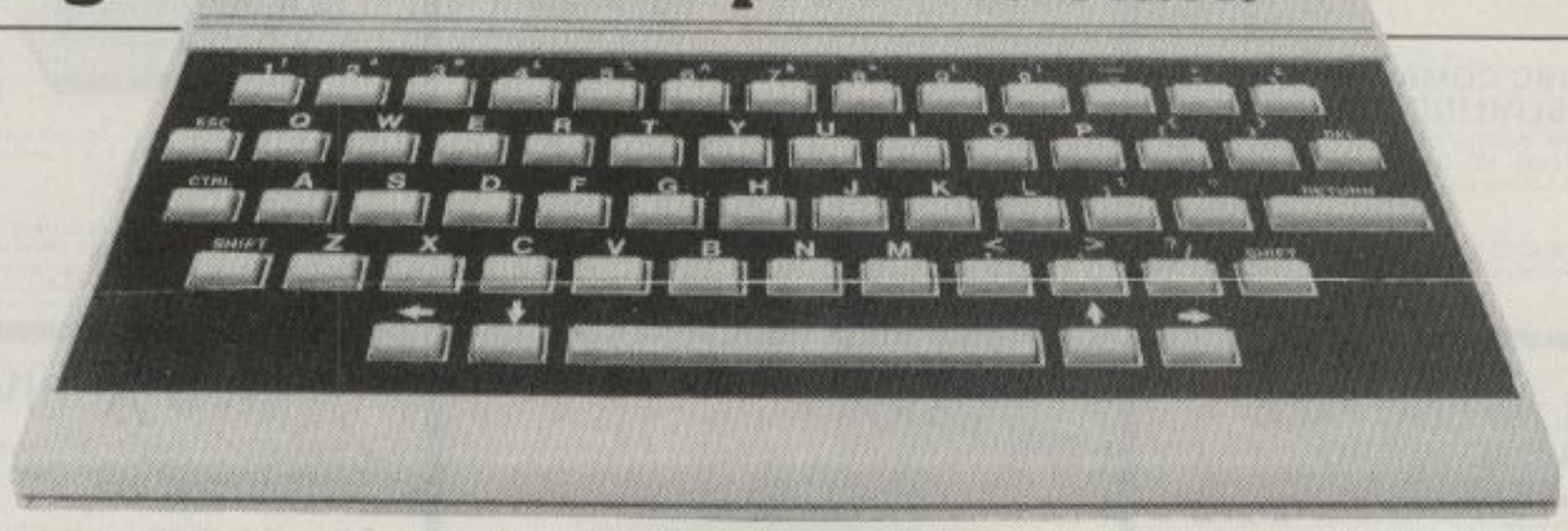
ORDERING INFORMATION:
All orders which accompany a cheque, cash or postal orders are *CARRIAGE FREE* (UK only). Please make cheques and postal orders payable to "AKHTER INSTRUMENTS". A carriage charge of 3% of invoice total is applicable to BARCLAYCARD and ACCESS orders. We accept official orders from 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.



MICROSPOT

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=40960 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 _____

_____

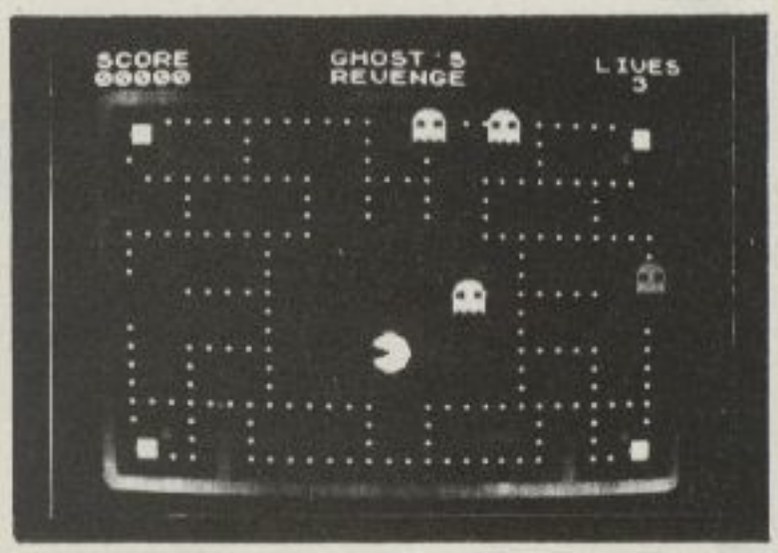
_____

2K spectrum

NEW! GHOST'S REVENGE

by Dominic Wood

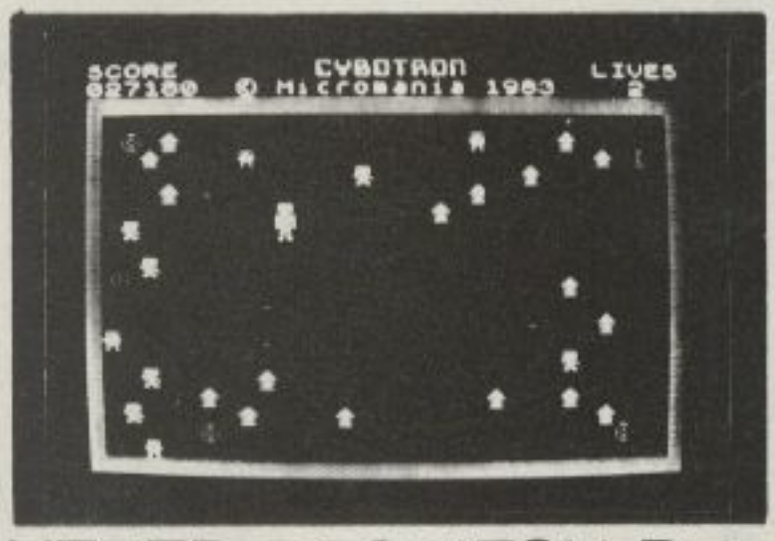
The best maze-chaser game available for the Spectrum *Super-fast machine code action *Excellent graphics *Full use of colour *Sound effects and tunes *Normal or Invisible maze *Skill level selector, novice to expert; this game cannot be beaten *Usual features, gobble action, four ghosts, power pods that 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' (Quicksilva) £5.95, 'Dragonhawk' (Pentagon) £6.95, 'Vultures' (Dragon Galaxians, Morrison) £6.95, 'Droids' (great new action game, Morrison) £6.95, 'Drone' (Tron-type garre, Cable Software) £8.75, 'Spider' (Premier) £4.95, 'Bopswizzle' (beat the Gloops, Smoochers and Yerkles!) £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 Cddessy' (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 Wintersoft'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-schoo letters and numbers) £3.95, Action Pack (mazes and simple arcade) £3.95

UTILITIES: Editor/Assembler/Monitor cartridges and manuals Compusense £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' £4.95; '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 _____

ADDRESS _____

_____

_____

SIGNED _____

FOR OUR COMPLETE PRICE LIST

PLEASE TICK ☐ PLEASE DEBIT MY ACCESS NO ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

PLEASE SEND ME

TOTAL £	
+ CARRIAGE £	
TOTAL ENCLOSED £	

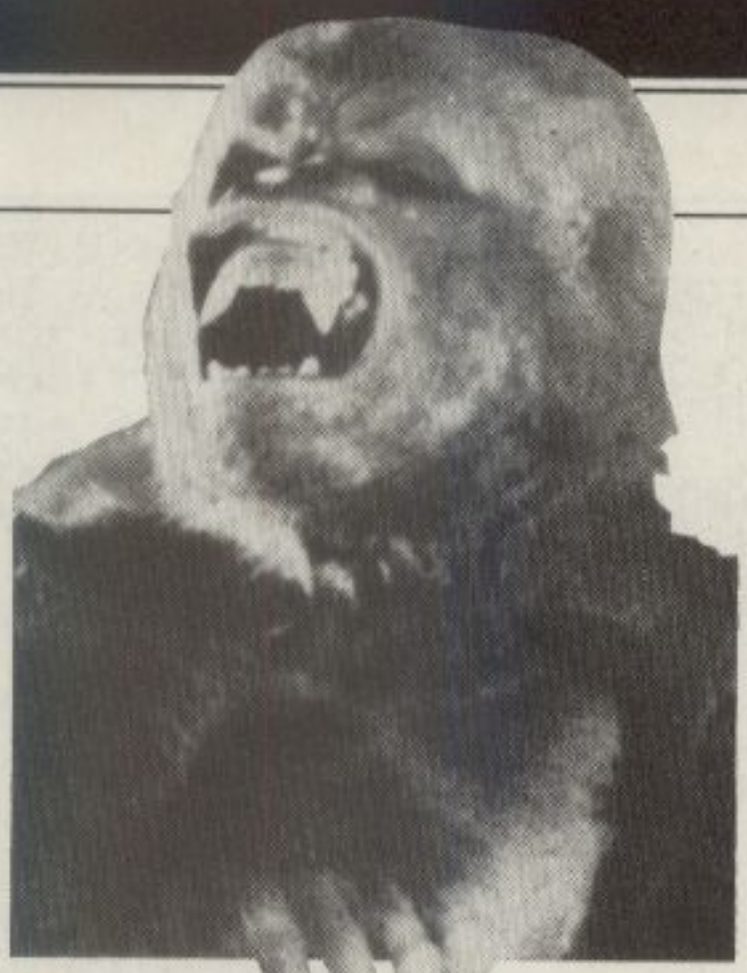


KRAZEE KONG

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

Variables:

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

HINTS ON CONVERSION

Krazee 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

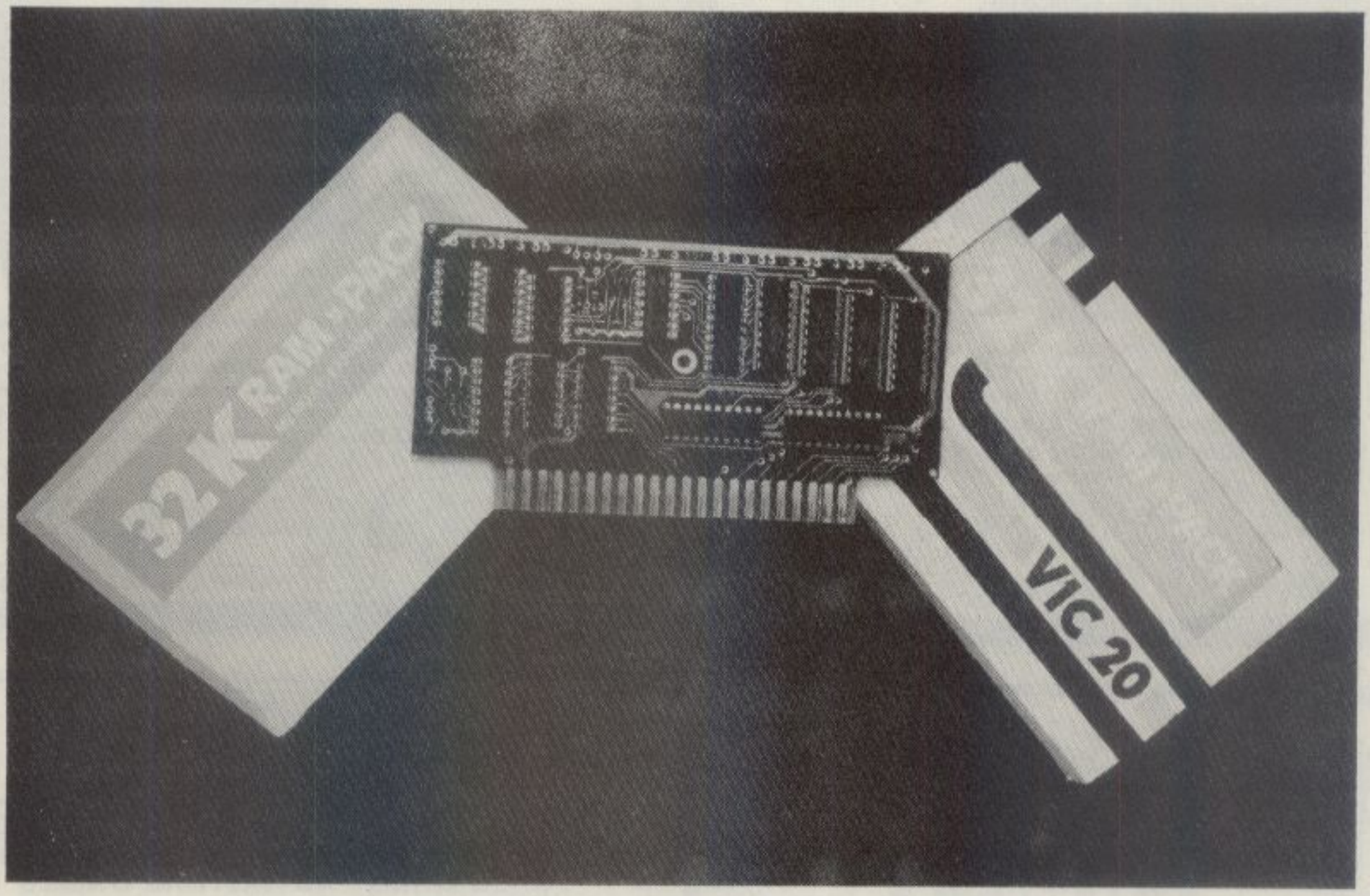
90 DATA 126,129,189,161,161,189,129,126
100 DATA 0,0,0,0,126,159,159,126
110 DATA 255,255,153,102,102,153,255,255
120 DATA 255,129,255,129,255,129,255,129
130 DATA 255,255,255,255,255,255,255,255
140 DATA 255,0,234,170,235,0,255,255
150 DATA 0,0,41,237,237,255,255,255
200 DIM CHAR$(14)
210 CHAR$="!#,.&'@( )<>-=+"
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(CHO
RG+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:DRAWT
O 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:PB(A)=0:PA(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=STRIG(
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,Q,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,Q,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
2 — STOCK CONTROL
3 — MAILING LIST
4 — INVOICE STATEMENTS
4 — HOME ACCOUNTS
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 ☐

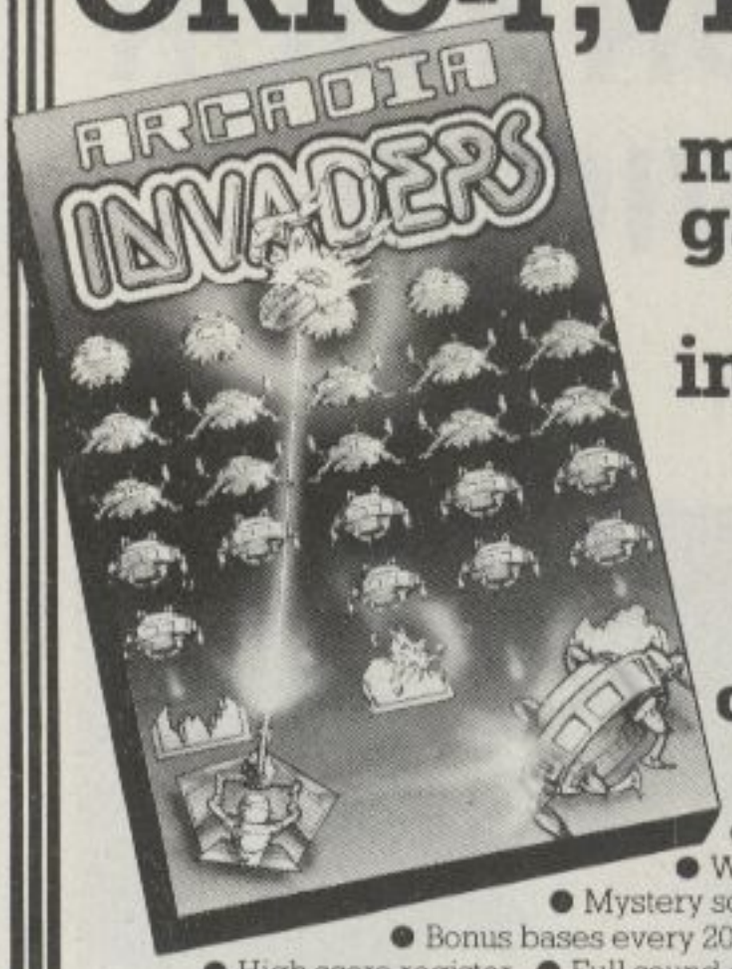
32K RAM PACK on its own at £49.99 ☐

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!

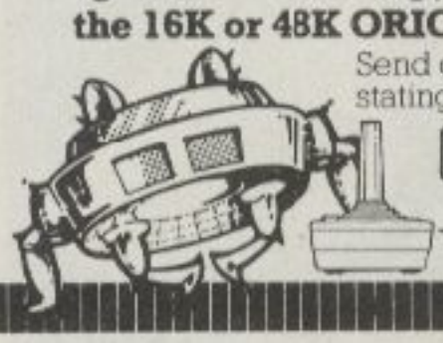
only **£5.50**

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:-

ARCADIA 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 50 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:-

ARCADIA 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



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!

FIRENWOOD — 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.



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

£49.95 incl. VAT & p&p

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

- ☐ 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 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
PONTOON
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

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

SUPPLY CASSETTE 50 FOR *COMPUTER*

I enclose cheque/P.O. payable to U.T.S.....
Name.....
Address.....
.....
Mail Order Only PCT

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.



Variables Used

W, G, R	Running totals of your Warriors, Gold and Rations
DW, DG	Gold and Warriors in possession of the Dragon
X	Your geographical location
WW	Warlock
HH	Healer
GG	Guide
MM	Mule
SS	Magic Sword
K	Number of keys found
YY	Counter used towards your score
T,U,J,L	General purpose variables
P	Your warrior loss in a battle
Q	Brigands loss in a battle
QQ	Used to indicate a battle inside the Citadel
ZZ	Ensures that the key sequence does not change during a game
E	Counter used in key sequence
O$	Key Sequence
Z$	Your move

Other string variables are used to query whether you will enter a buliding, fight and other decisions.

GUIDE TO UPPER CASE AND Lower case LETTERS

abcdefghijklmnopqrstuvwxyz
♠▌▀▔▀▌▙▚▞▛▜▟▙▌▗▖▘▝▗▖▘▝▗▖▘▝
ABCDEFGHIJKLMNOPQRSTUVWXYZ

HOW IT RUNS

2-9	Set variables and clear screen
90-96	Inventory printed at the beginning of each move
100-106	Controls your move
120-127	Rations depleted at end of each move
128	Warriors starve if no rations left
140-153	Sanctuary routine
160-265	Bazaar routine
164	Decides what is on offer and the price
174-188	Rations for sale
192-202	Warriors for sale
204-214	Haggle over the price
216-228	Mule for sale
238-245	Guide for sale
258-265	Healer for sale
280-301	Decides what happens on the open plains
302-305	Uncharted Territory routine
308-311	Plague routine
313-316	Warlocks Curse routine
318-324	Dragon Attacking routine
325-347	Brigands Attacking routine
360	Quest completed
362-371	Decides what rewards are gained
372-374	Awards Magic Sword
376-378	Awards Warlock
380-382	Awards Keys
384	Awards Warriors
390-394	Awards Gold
400-422	Tomb and Ruin routine
432-460	Key sequence
700-710	Checks for valid moves
900-924	Calculates your new position
920-924	Inventory update routine from Bazaar
1000-1050	Prints your score and restarts game when you are ready

HINTS ON CONVERSION

This game has been restricted in view of the memory it utilises to ensure that it fits and runs in a standard VIC with 3K expansion. For machines with larger expansions then sound effects can easily be added. e.g. Doors opening when entering buildings, or running feet when the Brigands attack.

The symbols at the commencement of PRINT statements are to set colour. Statements are in blue, Awards in green, Forfeits in red, etc.

There are only 2 POKES in the program so conversion to other machines is easy. In addition to keeping an eye on their line length to prevent the breaking up of words then these 2 pokes are all that need be changed and they are not integral to the program.

POKE 36879,25 – sets screen and background to white
POKE 36869,242 – sets to Upper/Lower case

VIC 20

THE CITADEL

PROGRAM LISTING

```
READY.
  2 POKE36879,25:W=10:G=30:R=25:Y$="■ ⌐OU HAVE FAILED IN    YOUR ●UEST"
  3 I$="■⌐UYING    ↓↗":J$="■ ⌐OU ARE ON A PLAIN"
  4 DW=2:DG=4
  7 POKE36869,242
  8 X=2
  9 PRINT"□"
 90 PRINT"■.↗<⁻↗⌐⌐_⌐":PRINT"oARRIORS"W:IFW=1THENPRINT"□"," oARLOCK"
 91 PRINT"_ATIONS■"R:IFH=1THENPRINT"□","  ⌐EALER"
 92 PRINT"⌐OLD■■■■"G:IFG=1THENPRINT"□","  ⌐UIDE"
 93 PRINT"↗EYS■■■■"K:IFM=1THENPRINT"□","  ⁻ULE"
 94 IFS=1THENPRINT"⁻AGIC ●WORD"
 96 PRINT
100 PRINT"■⌐HICH WAY?"
101 IFX=2THENPRINT"⌐HE -ITADEL IS DUE    SOUTH"
102 GETZ$: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 _ATIONS":PRINT"2 oARRIORS STARVE"
130 IFW<1THENPRINT"■↗O oARRIORS LEFT":PRINTY$:GOTO1000
131 YY=YY+25
132 PRINT:GOTO90
140 PRINT"■⌐HERE IS A ●ANCTUARY":PRINT"⌐O IN   ↓↗?"
141 GETK$:IFK$=""THEN141
142 IFK$="N"THEN280
143 IFK$="Y"THENT=INT(RND(1)*4)+4:GOTO145
144 GOTO141
145 PRINT"■_ECRUIT"T+2"oARRIORS":PRINT"⌐ATHER"T+1"_ATIONS":PRINT"⌐IVEN"T"⌐AGS O
F ⌐OLD"
146 W=W+T+2:IFW>99THENW=99
147 R=R+T+1:IFR>99THENR=99
148 G=G+T:IFG>W*6+MM*50THENG=W*6+MM*50
152 IFK=3THENPRINT"_URTHER _ECRUITS":W=W*2:IFW>99THENW=99
153 GOTO120
160 PRINT"■⌐HERE IS A ⌐AZAAR":PRINT"⌐O IN   ↓↗?"
161 GETX$:IFX$=""THEN161
162 IFX$="N"THEN280
163 IFX$<>"Y"THEN161
164 T=INT(RND(1)*5)+1:U=INT(RND(1)*3)+1:J=INT(RND(1)*5)+6
165 ONTGOTO174,192,216,238,258
174 PRINT"_OR SALE _ATIONS":PRINTU"⌐AGS OF ⌐OLD PER UNIT":PRINTI$
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"■⌐AZAAR OWNER KILLS YOU FOR NOT BEING ABLE TO PAY":PRINTY$:G
OTO1000
188 GOTO920
192 PRINT"_OR SALE"U"oARRIORS":PRINTJ"⌐AGS OF ⌐OLD":PRINTI$
194 GETB$
195 IFB$="N"THEN120
196 IFB$<>"Y"THEN194
202 PRINT"⌐HAT WILL BE"J*U"⌐AGS"
204 PRINT"♠GREE THE PRICE  ↓↗?"
206 GETC$
207 IFC$="Y"THEN186
208 IFC$<>"N"THEN206
210 L=INT(RND(1)*2)+1
212 IFL=1THENPRINT"■⌐AZAAR ⁻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$<>"Y"THEN224
228 U=1:GOTO204
238 IFGG=1THENL=1:GOTO212
240 PRINT"■-OR SALE |UIDE"J"|AGS OF GOLD. /EVER GET   LOST":PRINTI$
242 GETE$
243 IFE$="N"THEN120
244 IFE$<>"Y"THEN242
245 U=1:GOTO204
258 IFHH=1THENL=1:GOTO212
260 PRINT"■-OR SALE  |EALER"J'|AGS OF |OLD. /EVER FFLL  ILL":PRINTI$
262 GETF$
263 IFF$="N"THEN120
264 IFF$<>"Y"THEN262
265 U=1:GOTO204
280 J=INT(RND(1)*12)+1
282 IFJ=1THEN302
284 IFJ=3THEN308
286 IFJ=5THEN318
288 IFJ=7THEN313
290 IFJ=9THEN325
291 PRINT"■LL CLEAR. /O DANCER"
300 REM
301 GOTO120
302 PRINT"■,NCHARTED |ERRITORY"
303 IFGG=1THENPRINT"■OU HAVE A |UIDE":PRINT"|AIN 2 oARRIORS":W=W+2:IFW>99THENW=
99
304 IFGG=1THEN120
305 PRINT"■/O |UIDE":PRINT"LOSE 2 oARRIORS":W=W-2:GOTO120
308 PRINT"■LAGUE AREA"
309 IFHH=1THENPRINT"■OU HAVE A  |EALER":PRINT"|AIN 2 oARRIORS":W=W+2:IFW>99THEN
W=99:GOTO120
310 IFHH=1THEN120
311 PRINT"■/O  |EALER. 2 oARRIORS DIE":W=W-2:GOTO120
313 PRINT"■|HIS AREA -URSED"
314 IFWW=1THENPRINT"■OU HAVE A oARLOCK      CURSE FAILS. |AIN 2   oARRIORS":W=W
+2:IFW>99THENW=99
315 IFWW=1THEN120
316 PRINT"■/O oARLOCK. LOSE 1/4  OF |OLD":G=3*G/4:G=INT(G):GOTO120
318 PRINT"■-RAGON ↑TTACKS"
319 IFSS=1THENPRINT"■OU HAVE THE ♥WORD     SLAY -RAGON":PRINT"-APTURE"DW"oARRIO
RS AND"DG
320 IFSS=1THENPRINT"|AGS OF |OLD"
321 IFSS=1THENG=G+DG:W=W+DW:DW=4:DG=2:IFW>99THENW=99:IFG>W*6+MM*50THENG=W*6+MM*
50
322 IFSS=1THENPRINT"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" ■OU HAVE"W"oARRIORS":PRINT"_IGHT OR _ETREA
T  -/_?"
327 GETG$
328 IFG$="R"THENW=W-2:PRINT"LOSE 2 oARRIORS IN THE RETREAT":GOTO120
329 IFG$="F"THEN336
330 GOTO327
336 P=INT(RND(1)*6)+1:Q=INT(RND(1)*7)+3
338 W=W-P:J=J-Q
340 IFW<1THEN130
342 IFJ<1THENPRINT"■OSE"P"WARRIORS IN THEBATTLE":GOTO360
343 PRINT"■OSE"P"WARRIORS IN THE BATTLE":PRINTQ"BRIGANDS DEAD"
344 PRINT"♥KIRMISH OVER"
345 IFW-J>3ANDW<20THENPRINT"WELL DONE. CAPTURE"J"MEN"
346 IFW-J>3ANDW<20THENPRINT"|HEY WILL FIGHT WITH  YOU":W=W+J:GOTO360
347 GOTO326
360 IFK=3ANDQQ=1THENPRINT"■ELL DONE":PRINT"QUEST COMPLETED":GOTO1000
362 J=INT(RND(1)*8)+1
364 IFJ=1ORJ=3THEN372
366 IFJ=2ORJ=7THEN376
368 IFJ=4ORJ=5THEN380
370 IFJ=6ORJ=8THEN384
371 GOTO390
372 IFSS=1THEN390
374 SS=1:PRINT"■EWARD - AGIC ♥WORD  /ILLS -RAGONS":GOTO390
376 IFWW=1THEN390
378 WW=1:PRINT"■EWARD - oARLOCK":PRINT"ROTECTS FROM CURSE":GOTO390
```

THE CITADEL

PROGRAM LISTING

```
380 IFK=3THEN390
382 K=K+1:PRINT" OU HAVE NOW FOUND"K" EYS":GOTO390
384 PRINT" AIN 2 ECRUITS":W=W+2:IFW>99THENW=99
390 J=INT(RND(1)*10)+1
392 IFJ=5THENPRINT" O |OLD FOUND":GOTO120
394 G=G+4:PRINT" IND 4 |AGS OF |OLD":GOTO120
400 PRINT" HERE IS A |OMB":PRINT"|O IN  V"
401 GETU$
402 IFU$="N"THEN280
403 IFU$<>"Y"THEN401
404 GOTO410
405 PRINT" HERE IS A RUIN":PRINT"|O IN  V?"
406 GETV$
407 IFV$="N"THEN280
408 IFV$<>"Y"THEN406
410 J=INT(RND(1)*3)+1
420 IFJ=2THEN325
422 GOTO362
432 PRINT"-ITADEL.  SE THE EYS IN THE CORRECT ORDER"
433 IFZZ=1THEN442
434 J=INT(RND(1)*6)+1:ZZ=1
436 IFJ=1THENO$="BSG"
437 IFJ=2THENO$="BGS"
438 IFJ=3THENO$="GSB"
439 IFJ=4THENO$="GBS"
440 IFJ=5THENO$="SBG"
441 IFJ=6THENO$="SGB"
442 E=1
443 PRINT" HE EYS ARE |OLD,  ILVER AND |RASS."
444 PRINT"WHICH EY - |, OR |";:INPUTH$
446 IFH$=MID$(O$,E,(1)>THENE=E+1:GOTO450
448 PRINT"O_ /| ":PRINT"YOU ARE BACK ON THE  PLAIN. THE CITADEL IS DUE SOUTH":
X=2:GOTO120
450 IFE>3THENQQ=1:GOTO325
460 PRINT" ORRECT":GOTO444
700 IFX=1ANDZ$<>"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" OU NEED 3 KEYS TO  ENTER THE -ITADEL":GO
TO100
709 GOTO104
710 PRINT" AN'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$="W"THENX=9:GOTO917
916 IFX=9THENX=8
917 ONXGOTO432,280,160,400,280,280,140,280,405
920 IFT=2THENW=W+U
921 IFT=3THENMM=1
922 IFT=4THENGG=1
923 IFT=5THENHH=1
924 GOTO120
1000 PRINT:PRINT" OUR SCORE IS"
1010 SC=YY+50*(GG+HH+WW+SS+MM)+1000*K+1500*E+50*(G+R+W)
1020 PRINT:PRINTSC
1030 PRINT:PRINT" IT ANY EY"
1040 GETZZ$:IFZZ$=""THEN1040
1050 CLR:GOTO2
```

NEW! ZX SPECTRUM TAPE NOW READY!
NEW! EXPANDED DISC VERSIONS FOR APPLE, PET AND SHARP!

SOFTWARE FROM PERSONAL COMPUTING TODAY

THE VALLEY



ASP LTD 1982

What are you . . . Barbarian or Wizard?

Choose your character type carefully . . . Barbarians recover quickly but their magic doesn't come easily. A Wizard? Slow on the draw and slow to mature . . . but live long enough and grow wise enough and your lightning bolts are almost unstoppable . . .

The Valley is a real-time game of adventure and survival. You may choose one of five character types to be your personal 'extension of self' to battle and pit your wits against a number of monsters. Find treasure, fight a Thunder-Lizard in the arid deserts of the Valley, conquer a Kraken in the lakes surrounding the dread Temples of Y'Nagioth or cauterise a Wraith in the Black Tower. In fact live out the fantasies you've only dared dream about. BUT BEWARE . . . more die than live to tell the tale!

You've read the program (Computing Today — April '82) . . . Now buy the tape. Tape versions (£11.45 each inc P&P and VAT) available for: ZX Spectrum (48K), Atari 400 and 800 (32K), Tandy TRS-80 Model 1 Level 2, BBC Model A and B, Sharp MZ-80A, Sharp MZ-80K (18K), VIC-20 (with 16K RAM pack) and PET (New ROM, 16K RAM minimum). Disc version (£13.95 each inc P&P and VAT) available for: Apple II (DOS 3.3), Sharp MZ-80A, Sharp MZ80K and PET 8032 (8050 drives).

A complete reprint of the Valley article is also available for those wishing to do their own conversions for £1.95.

Fill in the coupon and return it to CT Software, ASP Ltd., 145 Charing Cross Road, London WC2H 0EE and become one of the many to play . . . The Valley . . .

Please send me the following versions of The Valley program:

Tape . . . . . **@£11.45 all inclusive.**
Disc . . . . . **@£13.95 all inclusive.**
Article reprint . . . . . **@£1.95 all inclusive.**

I enclose cheque/PO for £. . . . . (payable to ASP Ltd).
OR Debit my Access/Barclaycard (delete as necessary)

Please use BLOCK CAPITALS
Name (Mr/Mrs/Miss) . . . . . .

Address . . . . . .

. . . . . Postcode . . . . . .

Signature . . . . . Date . . . . . .

Please allow 21 days for delivery

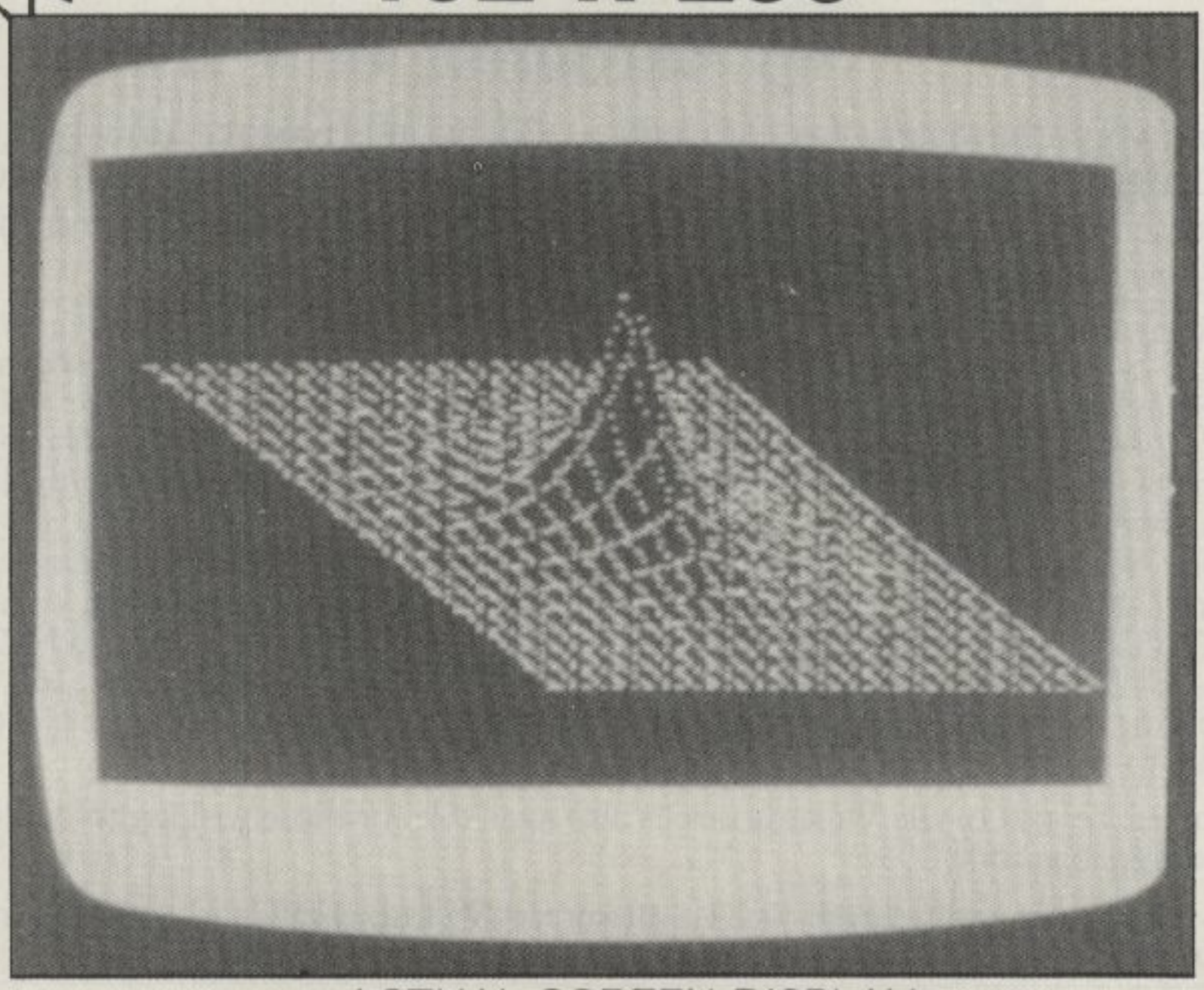
ASP SOFTWARE

EASY TO USE

FAST

16 K ZX - 81 HIGH RESOLUTION 192 x 256

NO HARDWARE REQUIRED



ACTUAL SCREEN DISPLAY

The Tool Box has 8 Hi-Res Commards 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 be 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 and 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 expertese 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 their 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 if 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 resonable 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 months issue we noticed that a few characters had cript 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 .....
.....
.....
.....
.....

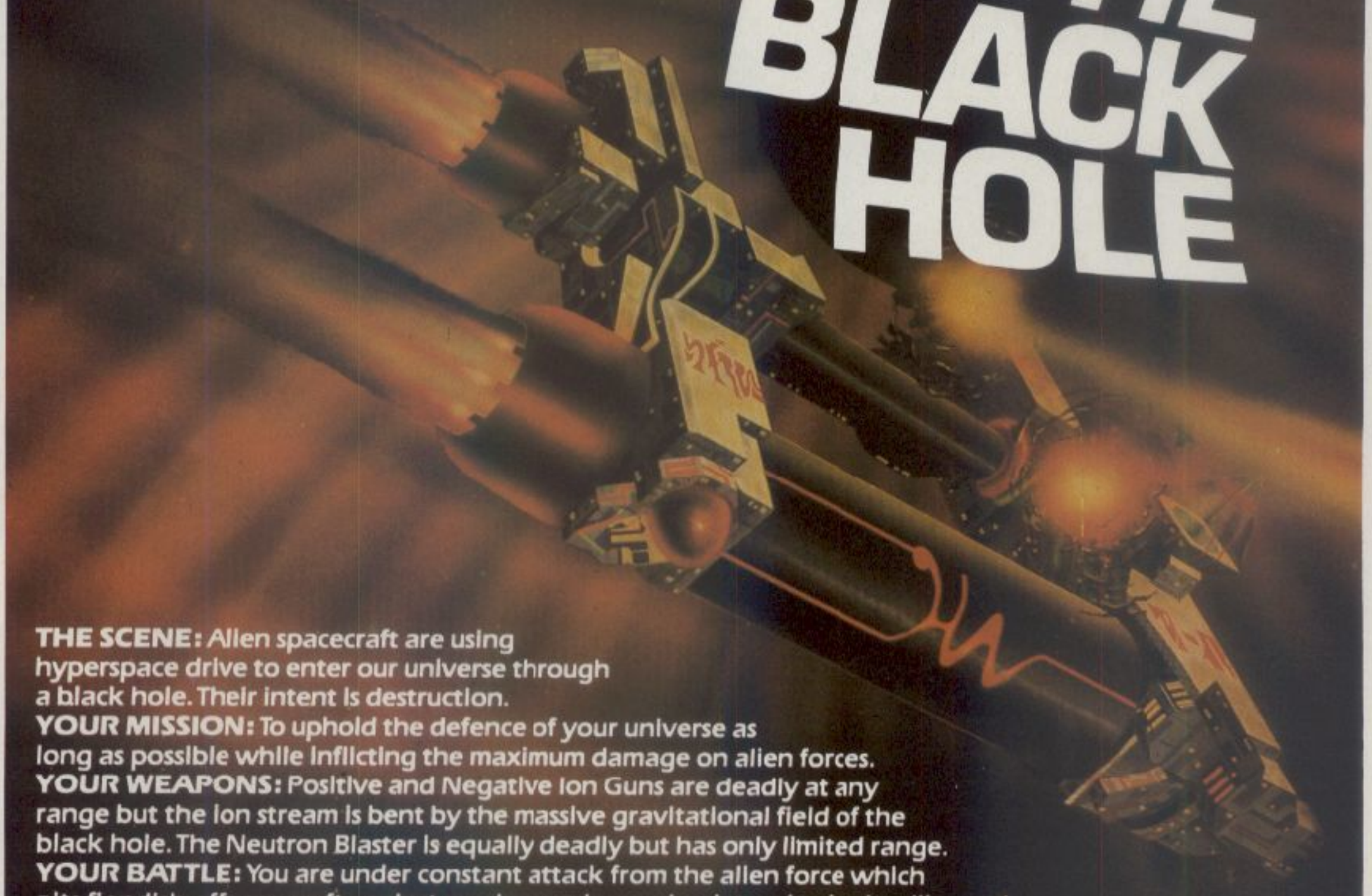


QUEST

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 validifier 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 convertors.

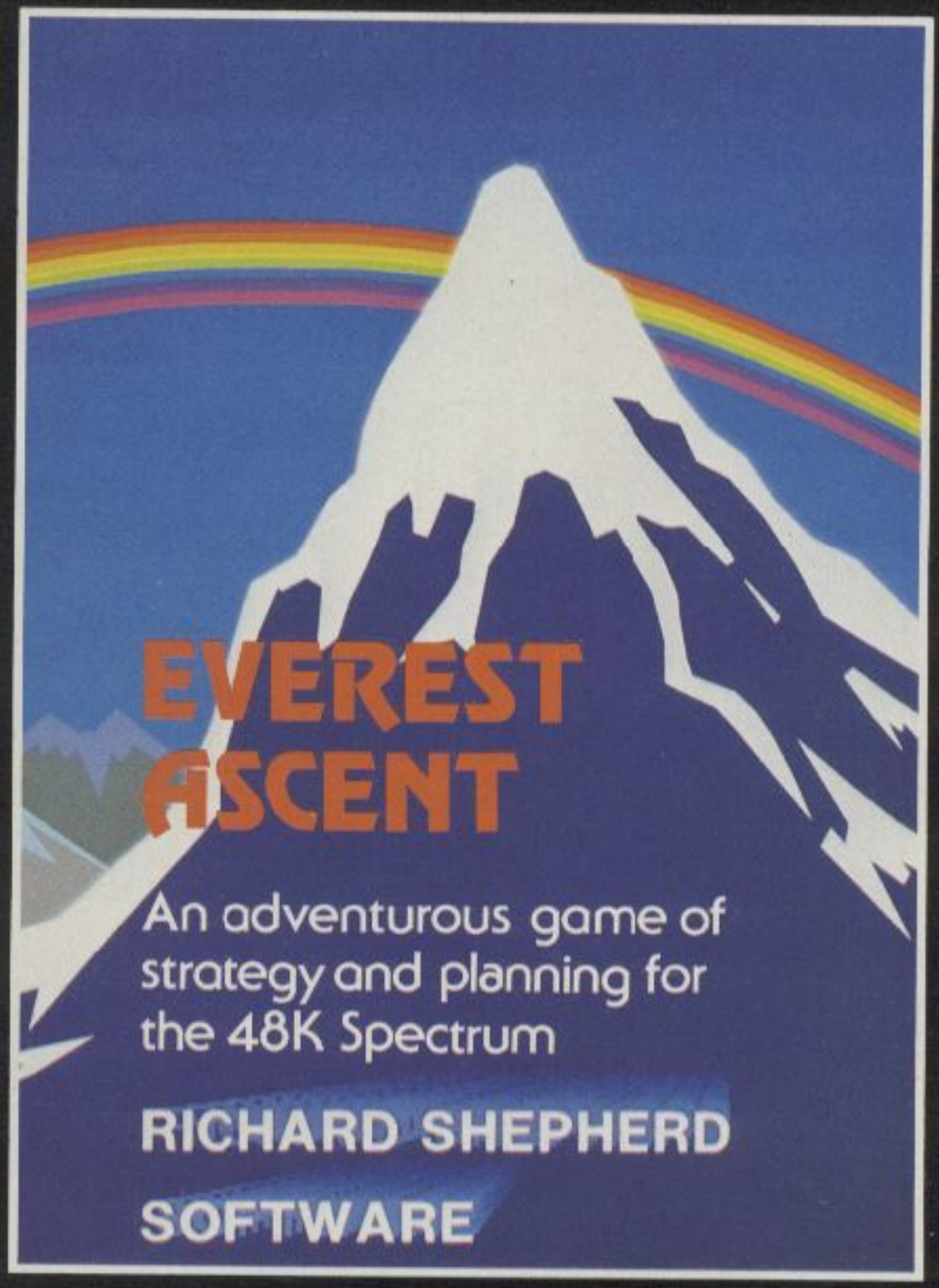
MEMOTECH

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 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

GAMES

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 Microsoftware**
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 eminate 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.

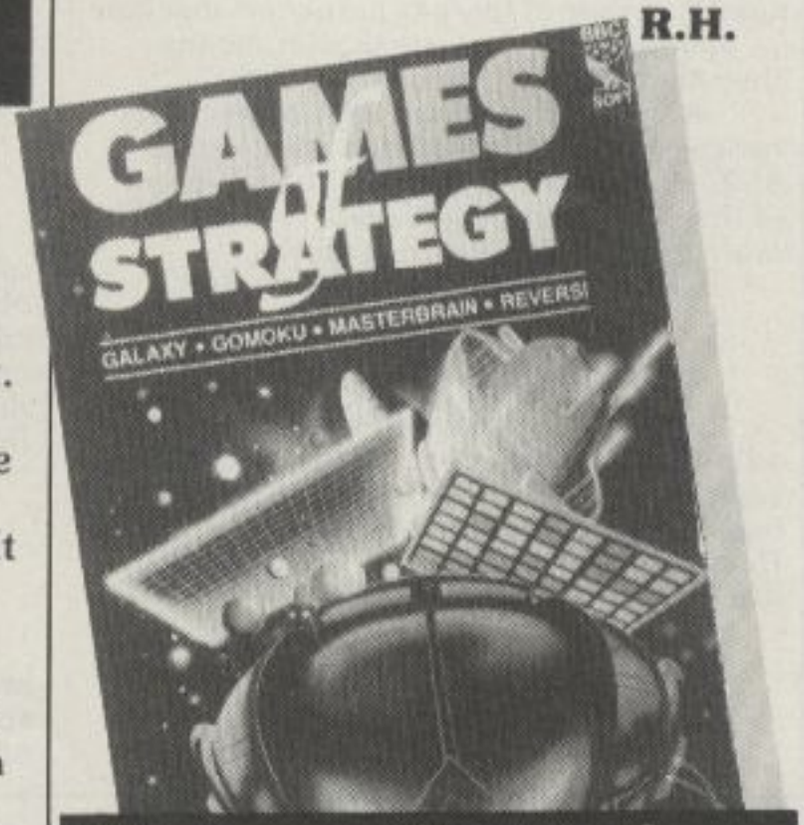
This is basically a good product, but someone needs to go over it from the point of view of GAME design as opposed to PROGRAM design AND do something about the instructions. They are neither informative or concise.

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%

R.H.



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

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

Galaxy is a fairly standard version of the popular computer game 'Startrek'. 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.

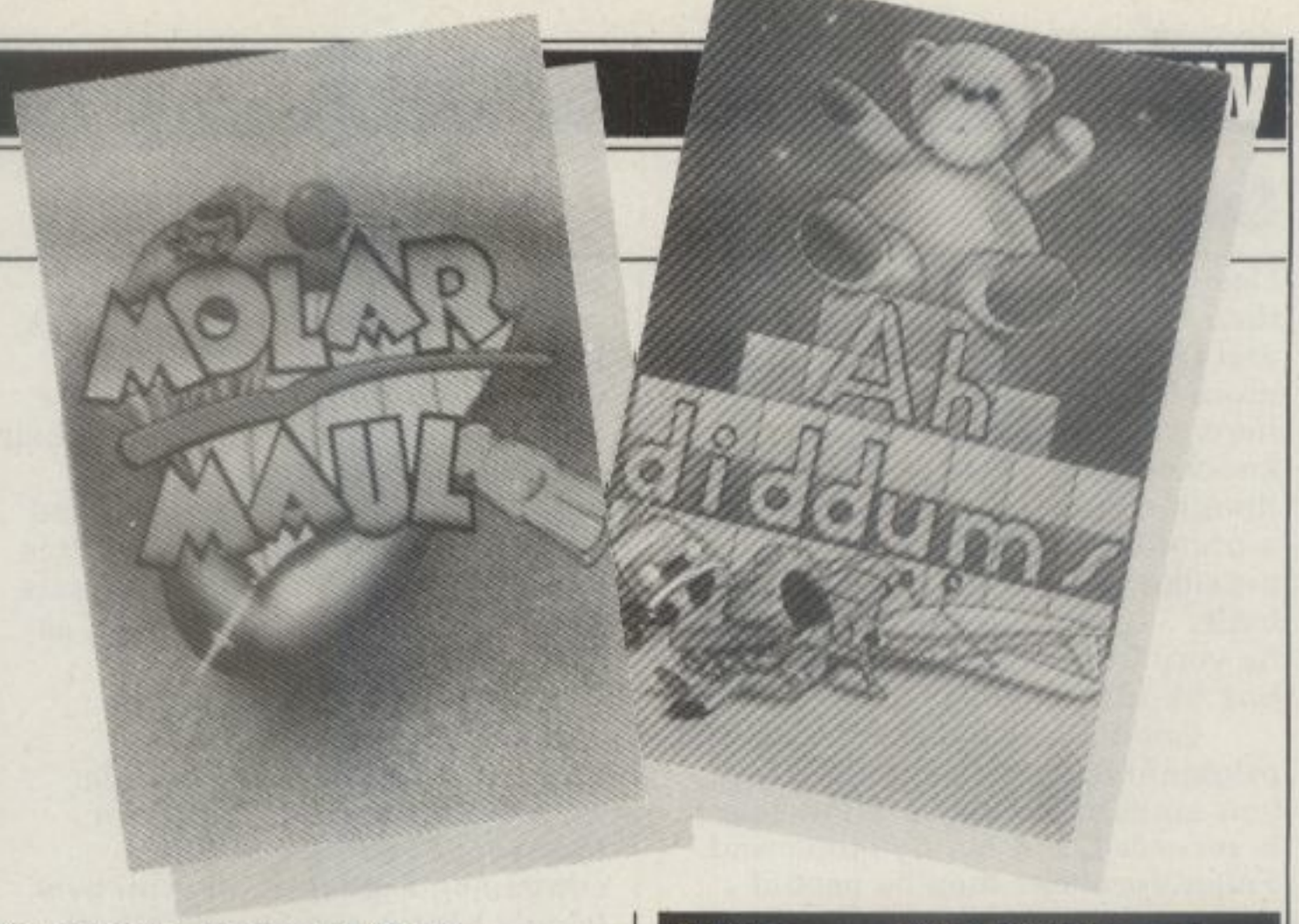
None of the programs are particularly stunning display-wise having been written in Mode 2 to ensure their working in the Model A. Despite these limitations they are quite enjoyable. The two board games, Gomuko and Reversi play to a reasonable standard. Although none of these programs are brilliant, they 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 loose 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 clambers 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 airoplanes, 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 ▶

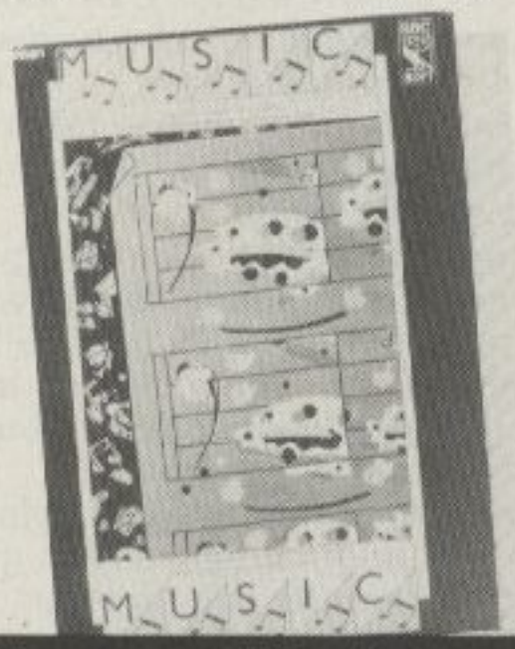
GAMES

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 stave; the longer the bar, the longer the note.

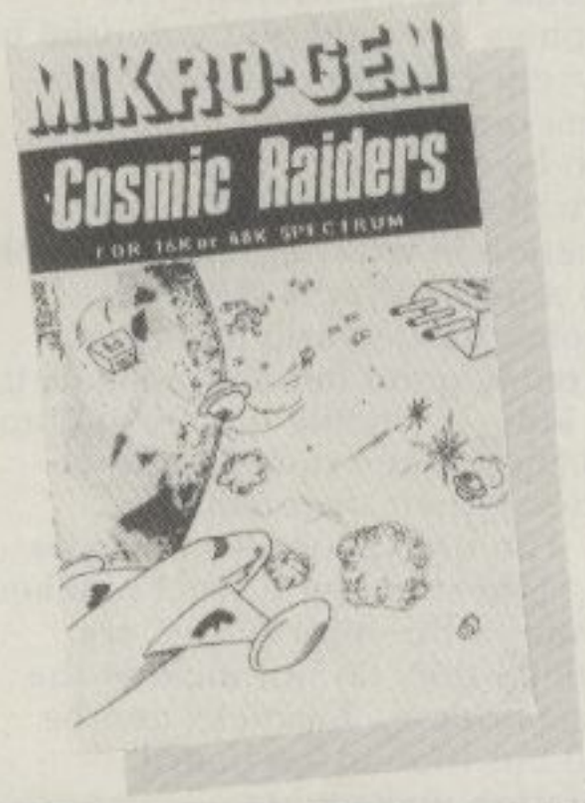
The four instruments voicings supplied are: organ, harpsicord, violin and piano. However, these do not really sound much like their instrument counterparts. The tempo of the piece can be altered between 0 (slow) and 9 (fast). It is possible to play back the contents of the three staves separately, as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

Access AMERICAN EXPRESS

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 childsplay 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.

THORN EMI VIDEO

The world's greatest computer games.



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.

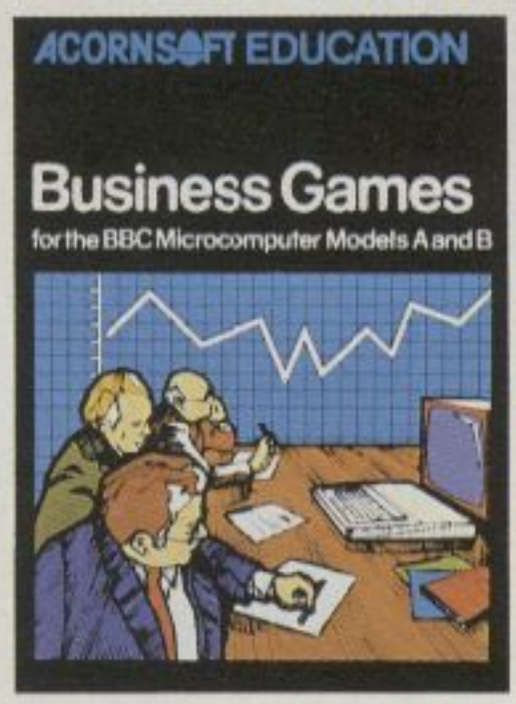
Countdown to Doom (£9.95) is a race against time as you strive to repair your damaged space ship in the corrosive atmosphere on the planet Doomawangara (Doom). Beat the clock or resign yourself to a life in the wilderness of Doom.

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.

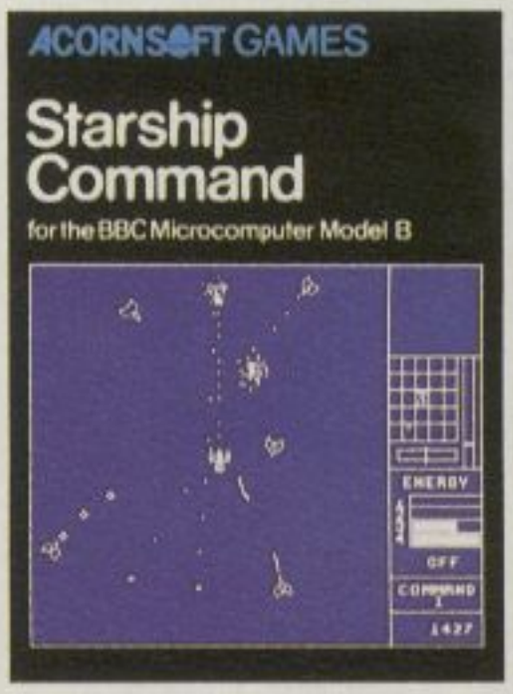
☎ Credit Card Holders. Telephone 01-200 0200.

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. 1524763. 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.
60-70	Goes to the subroutine which defines the characters and their colours.
80-110	Initialises the arrays and the two strings X$ and Y$.
120-150	Prints "ME" and "YOU" on the left and right of where the playing board will be.
160-210	These are the main parts of the playing board, ie. the chequered pattern.
220-230	These lines piece together the parts of the board into two strings.
240-270	Puts the above strings into the array A$.
280	Restores the data in line 290 in case of another game.
290-450	Puts each counter into its respective position for the start of the game.
460	The computers
480-620	This routine prints the board onto the screen directly from the array A$.
630-640	Places two small arrows at the top left hand corner of the screen.
650-720	This asks you if you want to go first, then jumps to the appropriate routine.
730-810	Puts your counter into the array B$ and the computer's counter into the array C$.
820-870	Sound effects before the computer takes its go.
890	Loop which counts 1 to 60 as the computer looks at each of the possible 60 places to go.
900	More sound effects.
910	This takes information from the computer's strategy with the aid of the loop K.
920	Tests to see if there is anything already on that square.
930-1130	Tests to see if there are any counters which can be captured and if so then that is where the computer will put the counter.
1140-1150	The K loop is only of concern when it is the computer's go, this tests to see whose go it is.
1160-1170	Checks to see if the last go was the human's go.
1180-1260	Puts the computer's counter into the array B$ and your counter into the array C$.
1270-1300	Prints out the message for you to input the line and column number.
1310	Jump to the routine which inputs your move.
1320	If you input 00 then this jumps to the routine for working out the scores.
1330-1350	This makes sure that you have not put your counter on top of another, it calls you a cheat if you have.
1360-1440	Checks each square on the board to count the number of your pieces and the number of the computer's pieces.
1450-1480	Prints the computer's score onto the screen.
1490-1520	Prints your score onto the screen.
1530-1620	These are the conditions for a win, lose or draw.
1630-1680	Tells you that you are a cheat if you try to put your counter onto another counter.
1690-1700	Sets move to 0 and goes to the computer's move.
1720-1780	This records your row number and puts it into Q5.
1790-1880	This records your column number and adds it to Q4.
1890-1910	This puts the value of your move into B and returns to the main program.
1920-1930	Tests for the colour of the background and if it is dark green then jump to line 2080.
1950	If there is a white gorilla needed then goto line 2020.
1960-2010	Print a black gorilla with a red background.
2020-2070	Print a white gorilla with a red background.
2090	If there is a white gorilla needed then goto line 2160.

GAMESBOARD

GORILLASSI

2100-2150	Print a black gorilla with a dark green background.
2160-2210	Print a white gorilla with a dark green background.
2220-2460	Clears the screen and defines all the characters.
2470	Changes the screen colour to cyan.
2480-2540	Defines the colours of all the characters then returns to the main program.
2550-2620	Routine for playing the three player tune Sweet and Low.
2630-2800	Data for the tune.
2810	Terminates the tune.
2820-2930	End routine for if the computer has beaten you.
2940-3050	End routine for if you beat the computer.
3060-3170	End routine for a draw.
3180-3220	Asks you if you want another game.
3230-3350	Alternates the colours on the board, checking to see if you have pressed a key also.
3360	If you pressed "Y" then start a new game.
3370-3410	Prints out GOODBYE on the screen and stops.

HINTS ON CONVERSION

TI BASIC is fairly standard so only its graphics commands will need explanation.

CALL HCHAR(ROW,COLUMN,ASCII NUMBER,NUMBER OF REPETITIONS)

This places a character or row of characters starting from (ROW,COLUMN) and moving right to the specified number of repetitions. If the last parameter is left out then only one character is printed.

CALL VCHAR(ROW,COLUMN,ASCII NUMBER,NUMBER OF REPETITIONS)

This is exactly as above except that it repeats down the screen instead of to the right.

CALL CLEAR

This clears the entire screen.

CALL GCHAR(ROW,COLUMN,VARIABLE)

This looks at the position (ROW,COLUMN) on the screen, then puts the ASCII code of that character into your variable.

CALL SOUND(DURATION,NOTE or NOISE,VOLUME)

CALL CHAR(ASCII NUMBER,"HEX REPRESENTATION")

This is used to define the characters. The HEX REPRESENTATION bit is made up of eight HEX numbers, each describing one line of an eight bit character.

CALL KEY(0,KEY,STATUS)

This is used to scan the keyboard, if a key has been pressed its ASCII code will end up in a variable, in this case KEY. The STATUS indicates the following:-

+1	A new key was pressed since the last performance of the CALL KEY routine.
-1	The same key was pressed during the performance of CALL KEY as was pressed during the previous performance.
0	No key was pressed.

CALL SCREEN(COLOUR CODE)

This changes the colour of the entire screen, using the following colour codes:-

1	TRANSPARENT	9	MEDIUM RED
2	BLACK	10	LIGHT RED
3	MEDIUM GREEN	11	DARK YELLOW
4	LIGHT GREEN	12	LIGHT YELLOW
5	DARK BLUE	13	DARK GREEN
6	LIGHT BLUE	14	MAGENTA
7	DARK RED	15	GRAY
8	CYAN	16	WHITE

CALL COLOR(CHARACTER GROUP,FOREGROUND COLOUR,BACKGROUND COLOUR)

The characters are grouped in eights from 32 to 159.

For example, CALL COLOR(1,2,16) will make all the characters from 32 to 39 be black with white backgrounds.

PROGRAM LISTING

```
10 CALL CLEAR
20 INPUT"YOUR NAME PLEASE ?":N$
30 IF LEN(N$)>8 THEN 20
40 T=1
50 GOSUB 2550
60 RANDOMIZE
70 GOSUB 2220
80 REM INIT ARRAYS
90 DIM B$(2,2),C$(2,2),A$(2,200)
100 X$=""
110 Y$=""
120 M$="@@ME@@@@@@@@@@@@@@@@@@@@@@@YOU"
130 FOR I=1 TO LEN(M$)
140 CALL HCHAR(5,I,ASC(SEG$(M$,I,1)))
150 NEXT I
160 REM DRAW BOARD
170 F$="  ,,  ,,  ,,  ,,"
180 G$=",,  ,,  ,,  ,,  "
190 K$=",,))))))))))))))),,"
200 H$=",,((((((((((((((,,"
210 J$=",,2@3@4@5@6@7@8@9@,,"
220 X$=H$&"*@"&F$&"@+*@"&G$&"@+*@"&F$&"@+*@"&G$&"@+*@"&F$&"@+*@"&G$&"@+*@"
    &F$&"@+*@"&G$&"@+"&J$
230 Y$=J$&"*1"&F$&"1+*2"&G$&"2+*3"&F$&"3+*4"&G$&"4+*5"&F$&"5+*6"&G$&"6+*7"
    &F$&"7+*8"&G$&"8+"&K$
240 FOR I=1 TO LEN(X$)
250 A$(1,I)=SEG$(X$,I,1)
260 A$(2,I)=SEG$(Y$,I,1)
270 NEXT I
280 RESTORE 290
290 DATA a,b,h,i,c,d,j,k,h,i,e,b,j,k,c,d
300 FOR I=89 TO 92
310 READ M$
320 A$(1,I)=M$
330 NEXT I
340 FOR I=89 TO 92
350 READ M$
360 A$(2,I)=M
370 NEXT I
380 FOR I=109 TO 112
390 READ M$
400 A$(1,I)=M$
410 NEXT I
420 FOR I=109 TO 112
430 READ M$
440 A$(2,I)=M$
450 NEXT I
460 E$="/nf R%$kY';hT96WE""O14H#JNJV@7M8CS>D*,*!-ta5[_\!1&1Usc10b+"
470 D$="'()13;<='
480 X=1
490 FOR A=1 TO 181 STEP 20
500 Y=6
510 FOR D=A TO A+19
520 CALL HCHAR(X,Y,ASC(A$(1,D)))
530 Y=Y+1
540 NEXT D
550 X=X+1
560 Y=6
570 FOR D=A TO A+19
580 CALL HCHAR(X,Y,ASC(A$(2,D)))
590 Y=Y+1
600 NEXT D
610 X=X+1
620 NEXT A
630 CALL HCHAR(2,3,34)
640 CALL HCHAR(1,4,33)
650 REM DECIDE WHO IS TO MOVE FIRST
660 M$="DO YOU WANT TO GO FIRST ?"
670 FOR I=1 TO LEN(M$)
680 CALL HCHAR(21,I,ASC(SEG$(M$,I,1)))
690 NEXT I
700 CALL KEY(0,K,S)
710 IF S=0 THEN 700
720 IF K=ASC("Y")THEN 1180
730 REM COMPUTER'S MOVE
740 B$(1,1)="a"
750 B$(1,2)="b"
760 B$(2,1)="c"
770 B$(2,2)="d"
780 C$(1,1)="h"
790 C$(1,2)="i"
800 C$(2,1)="j"
810 C$(2,2)="k"
820 FOR T2=1 TO 4
830 FOR T1=1 TO 5
840 CALL SOUND(-200,500+T1*20,T2*4)
850 NEXT T1
860 CALL SOUND(-200,250,12,266,10)
870 NEXT T2
880 CALL HCHAR(21,1,32,128)
890 FOR K=1 TO 60
900 CALL SOUND(-10,900,0)
910 B=ASC(SEG$(E$,K,1))-21
920 IF(A$(1,2*B)<>"^"*(A$(1,2*B)<>",")THEN 1150
930 H=0
940 FOR X=1 TO 0
950 N=ASC(SEG$(D$,X,1))-50
960 E=0
970 F=B
980 IF (A$(1,(F+N)*2)<>B$(1,2))THEN 1020
990 E=1
1000 F=F+N
1010 GOTO980
1020 IF(A$(1,(F+N)*2)<>C$(1,2))+(E=0) THEN 1130
1030 FOR A=B*2 TO F*2 STEP N*2
1040 A$(1,A-1)=C$(2,1)
```

```
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$="@WHERE TO@"&N$&"'S 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$(1,B*2)<>",")THEN1340 ELSE 1350
1340 GOTO 1630
1350 GOTO 930
1360 REM CALCULATE SCORE
1370 CP=0
1380 HP=0
1390 FOR A=23 TO 177 STEP 2
1400 IF A$(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 CAL 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$,I,1)))
1520 NEXT I
1530 IF HP=0 THEN 2820
1540 IF CP=0 THEN 2940
1550 IF CP+HP<64 THEN 1180
1560 IF CP>HP THEN 1570 ELSE 1580
1570 GOTO 2820
1580 IF CP<HP THEN 1590 ELSE 1600
1590 GOTO 2940
1600 IF CP=HP THEN 1610 ELSE 1620
1610 GOTO 3060
1620 END
1630 REM INVALID MOVE
1640 CALL SOUND(-4000,-1,0)
1650 MSG$="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 1750
1770 IF (K<48)+(K>56) THEN 1710
1780 CALL HCHAR(24,M,K)
1790 M=M+2
1800 Q$=Q$&STR$(K-48)
1810 CALL HCHAR(24,M,34)
1820 CALL SOUND(-100,900,0)
1830 CALL KEY(0,K,S)
1840 IF S=0 THEN 1830
1850 IF K=ASC("C") THEN 1710
1860 IF (K<48)+(K>57) THEN 1810
1870 CALL HCHAR(24,M,K)
1880 Q$=Q$&STR$(K-48)
1890 B=VAL(Q$)
1900 Q$=""
1910 RETURN
1920 CALL GCHAR(LINE,COL,CHR)
1930 IF (CHR=44)+(CHR=104)+(CHR=120) THEN 2080
1940 REM SQUARE IS RED
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 CLEAR
2230 CALL CHAR(33,"0001C097F3E1C03")
2240 CALL CHAR(34,"0038022E3F2E0C03")
2250 CALL CHAR(40,"FF0000000000000")
2260 CALL CHAR(41,"00000000000000FF")
2270 CALL CHAR(42,"8080808080808080")
2280 CALL CHAR(43,"0101010101010101")
2290 CALL CHAR(44,"FFFFFFFFFFFFFFFF")
2300 CALL CHAR(96,"0000000000000000")
2310 CALL CHAR(104,"03040A0830404894")
2320 CALL CHAR(105,"C02050100C021229")
2330 CALL CHAR(106,"A8A4A4947509327C")
2340 CALL CHAR(107,"25252529AE904C3E")
2350 CALL CHAR(112,"03040A0830404894")
2360 CALL CHAR(113,"C02050100C021229")
2370 CALL CHAR(114,"A8A4A4947509327C")
2380 CALL CHAR(115,"25252529AE904C3E")
2390 CALL CHAR(120,"03040A0830404894")
2400 CALL CHAR(121,"C02050100C021229")
2410 CALL CHAR(122,"A8A4A4947509327C")
2420 CALL CHAR(123,"25252529AE904C3E")
2430 CALL CHAR(97,"03040A0830404894")
2440 CALL CHAR(98,"C02050100C021229")
2450 CALL CHAR(99,"A8A4A4947509327C")
2460 CALL CHAR(100,"25252529AE904C3E")
2470 CALL SCREEN(8)
2480 CALL COLOR(1,9,1)
2490 CALL COLOR(2,13,1)
2500 CALL COLOR(9,2,9)
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 N1,N2,N3
2580 IF N1=0 THEN 2610
2590 CALL SOUND(-4000,N1,0,N2,0,N3,0)
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,
     415,262
2650 DATA 622,392,233,587,349,233,523,311,233,466,294,175,466,294,175,440,
     262,175
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,
2675 REM  370,220
2680 DATA 466,392,233,466,392,233,392,311,233,253,349,220,523,349,220,523,
     349,220
2690 DATA 698,466,294,587,349,233,622,392,233,523,311,233,523,311,220,587,
     311,196
2700 DATA 523,311,175,523,311,196,523,311,220,466,294,233,466,294,233,466,
     294,233
2710 DATA 466,415,294,587,415,233,523,415,262,466,415,294,523,415,311,466,
     415,294
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 622,392,262,622,392,262,622,392,262,622,349,196,622,349,220,587,
     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,
     415,294
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(21,1,32,128)
2830 M$="'''''''''BAD LUCK@"&N$
2840 M2$="@BUT I BEAT YOU@"&STR$(CP)&"@TO@"&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$,I,1)))
2900 NEXT I
2910 T=1
2920 GOSUB 2550
2930 GOTO 3180
2940 CALL HCHAR(21,1,32,128)
2950 M$="!!!!!!!!!!WELL DONE!!!!!!!!!"
2960 M2$="@YOU BEAT ME@"&N$&"@"&STR$(HP)&"@TO@"&STR$(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(21,1,32,128)
3070 M$="!!!!THAT WAS CLOSE!!!!"
3080 M2$="@A GOOD GAME@"&N$
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(21,1,32,128)
3190 M$="@ANOTHER  GAME@"&N$&"@?!!!!!!!"
3200 FOR I=1 TO LEN(M$)
3210 CALL HCHAR(21,I,ASC(SEG$(M$,I,1)))
3220 NEXT I
3230 CALL KEY(2,K,S)
3240 CALL COLOR(2,9,1)
3250 CALL COLOR(9,2,13)
3260 CALL COLOR(10,16,9)
3270 CALL COLOR(11,16,13)
3280 CALL COLOR(12,2,9)
3290 CALL SOUND(-10,900,1)
3300 CALL COLOR(2,13,1)
3310 CALL COLOR(9,2,9)
3320 CALL COLOR(10,16,13)
3330 CALL COLOR(11,16,9)
3340 CALL COLOR(12,2,13)
3350 IF S=0 THEN 3230
3360 IF K=ASC("Y")THEN 40
3370 M$="@GOODBYE@"&N$
3380 FOR I=1 TO LEN(M$)
3390 CALL HCHAR(23,1,ASC(SEG$(M$,I,1)))
3400 NEXT I
3410 GOTO 3410
```

ZX81

Games from ORWIN SOFTWARE

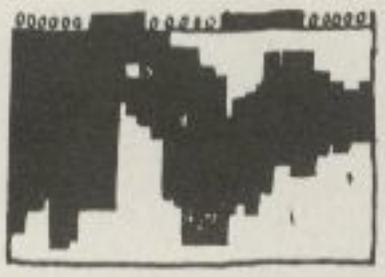
WHAT THEY SAID ABOUT CASSETTE 4

"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.
SNAKEBITE (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.
FUNGALOIDS (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.



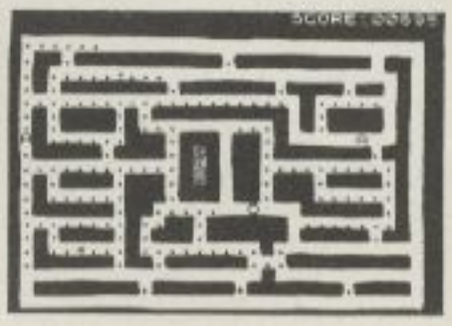
7 of the 8 games are in machine code because it is much faster than Basic. Some of these games were previously available from J. Steadman.

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

TI99/4A 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
Arcade Space Battle with Speech *

XXX NEW XXX
Speech Synth Required

We stock all items to expand your TI99/4A. 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
Meteroids	19.95
Ghost Attack	19.95
Cave Hunter	19.95
Starship Chameleon	19.95
Chess	24.95
Astroblaster	19.95
Calixo Island	7.95
Computa Voice	7.95
Graphic Animator	7.95
Quest	7.95
Madness/Mino	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
Mansion Adv	7.95
Alcatraz II	7.95
Racer Ball	7.95
Space Mono	7.95
Space War	7.95
Scarfman	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 Ardroid	7.95
Backgammon	7.95
Galactic Ambush	7.95
Program Packs 1 to 5 each	7.95
Light Pen	11.95
Joysticks (Pr)	19.95
Cassette Lead	2.70
Ed Assy Cass	10.95
Ed Assy ROM	Call

XXX NEW XXX

TELEWRITER Dragon 32 Word Pro, 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 Ptll	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
Genmon	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
Monopole	8.69
Adventure Pack	8.69

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 GP250X	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
Disk Drive	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
Centipede	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
Clowns & 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 Alp	5.95
Basic Comp Prog Home	9.70
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	6.95
Working Spectrum	5.95
60 Games Spectrum	4.95
Cver 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
Beg Guide Micro	3.95
Computing Is Easy	3.95
Intro Micro Prog	5.80
TRS 80 Basic	5.95
More TRS 80 Basic	
35 Progs Dragon	4.95
101 Colour Comp	5.95
Working Dragon	5.95
30 Hour Basic	5.95
35 Progs TI99/4A	5.95
Intro TI Basic	9.50
Prog TI Basic	16.95
Biling Into ZX81	4.95
6809 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 AYLMER 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 *ZX Printer now £39.95*
ZX81 was £49.95 *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 Sabateur 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.

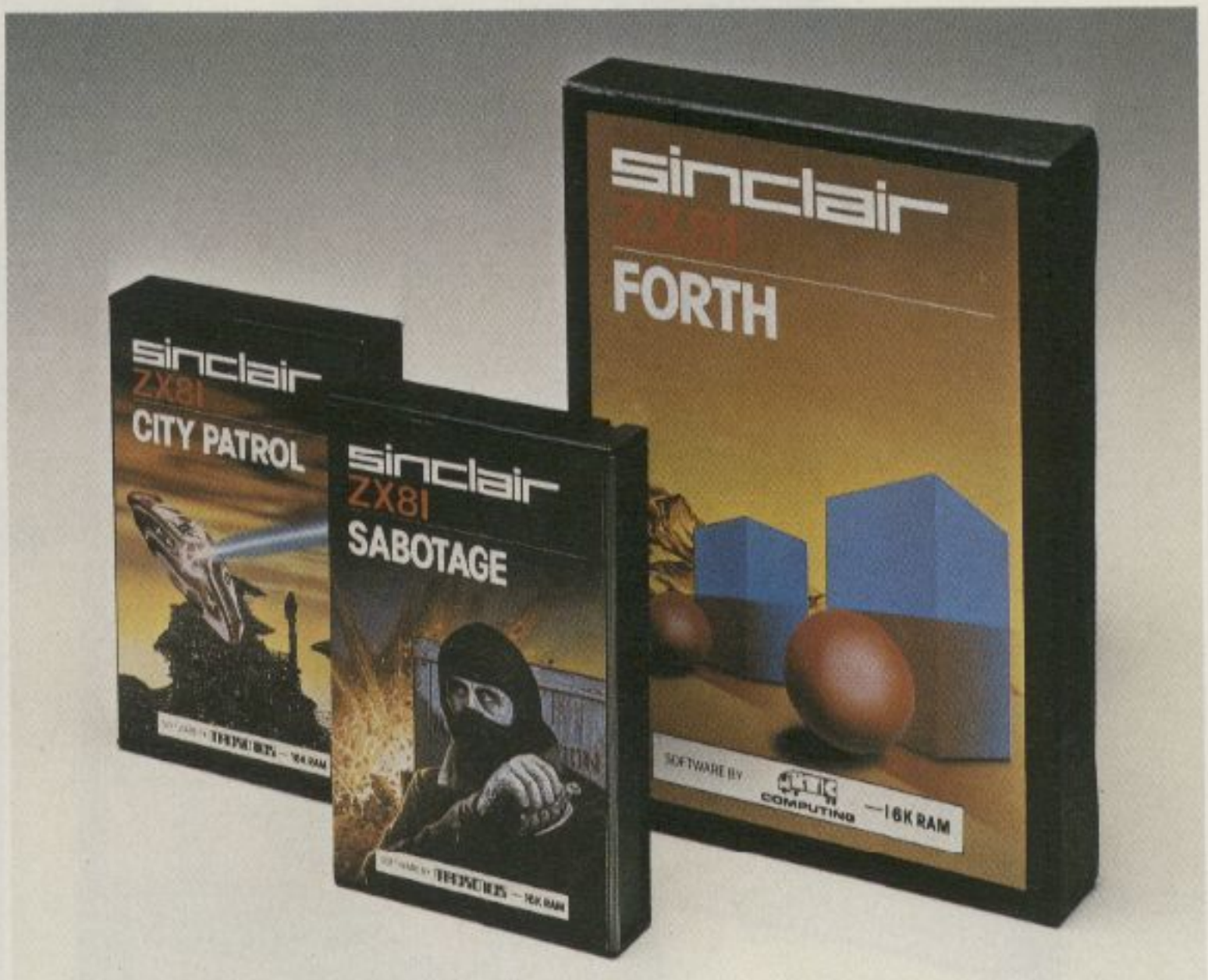
Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

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 – 48K	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

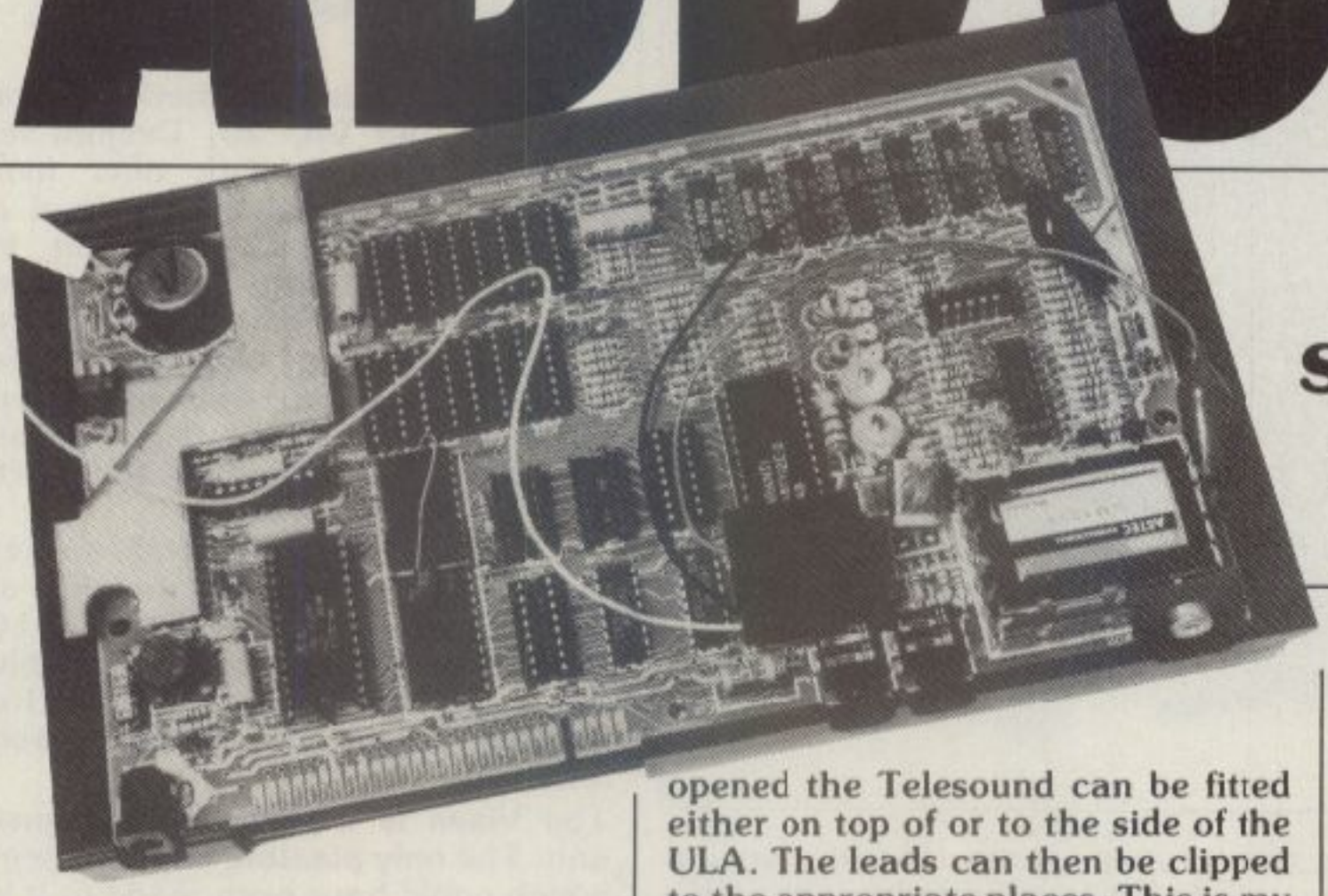
Mr/Mrs/Miss

Address

PCT 908

PERIPHERALS

ADD-ONS



Give your VIC, Spectrum and Ace peripheral power

Telesound 84

Anyone who has a Spectrum must now be tired of straining to hear the plaintive beeps that eminate 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 connecters 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.

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.

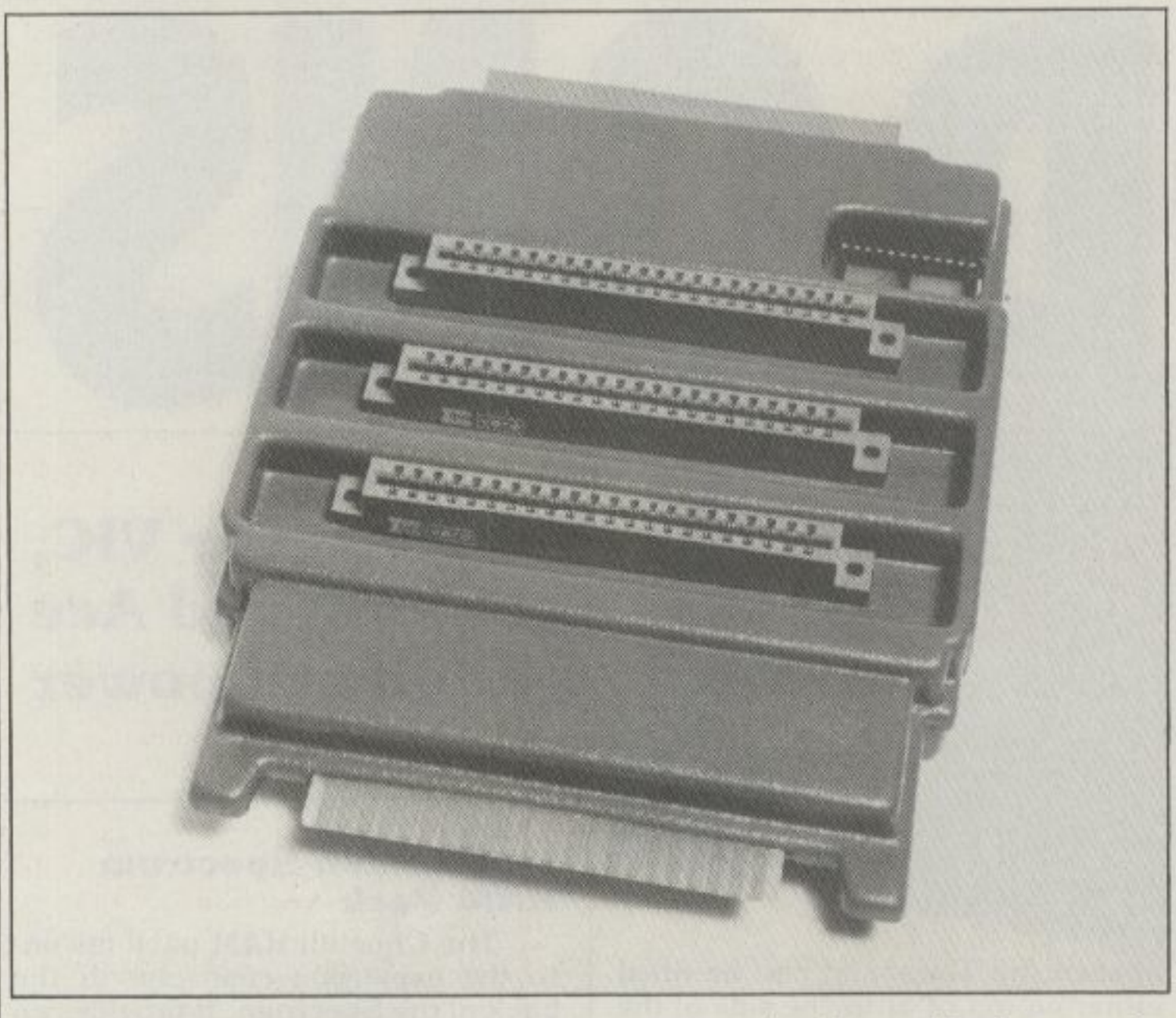
The unit is encased in a tough, black plastic moulded case which fits snugly onto the back of the Spectrum. It features a good quality edge connector which should stand up well to wear and tear. On the back of the pack is a repeat of the Spectrum's edge connector. This enables you to connect other peripherals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

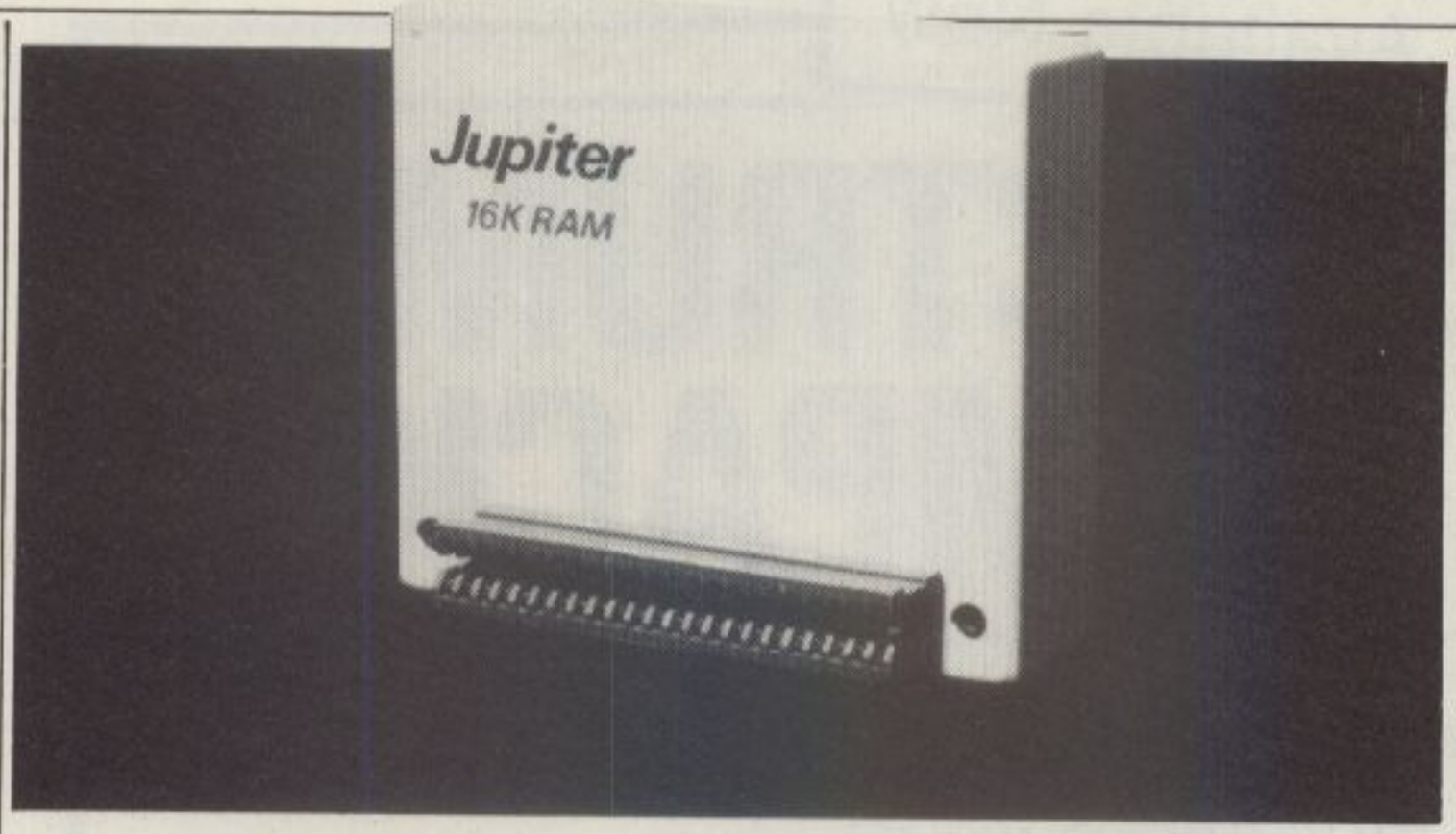
The Vixen is a motherboard for use with the VIC 20. Despite its name it does in fact offer four cartridge expansion sockets and a ROM chip socket. The unit is designed to fit into the cartridge expansion socket on the VIC. Three of the cartridge connectors are mounted in recessed wells on the top of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

Interpood 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 devive, 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 compatable 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 availalbe 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.

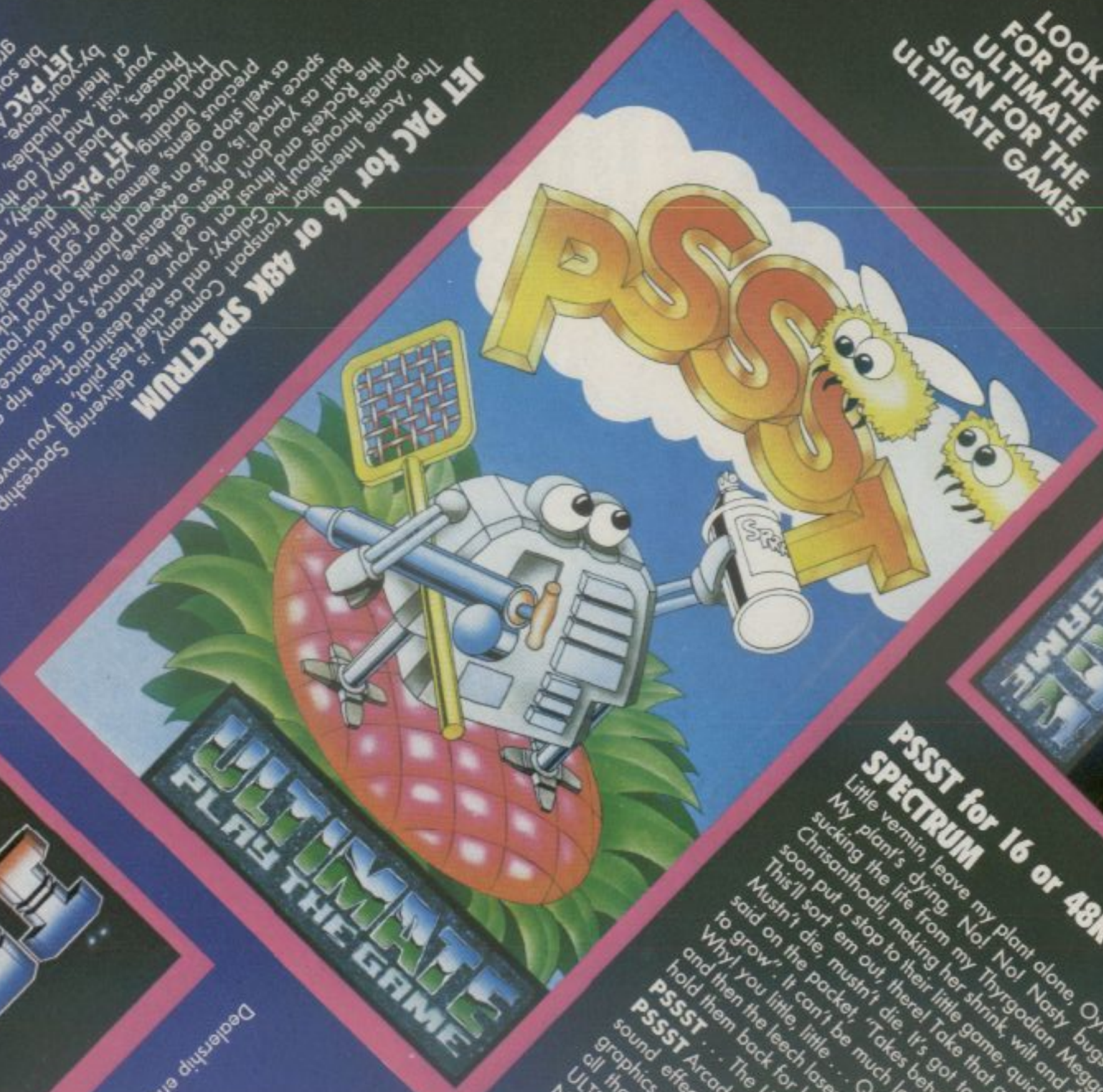
Send cheque/P.O. Payable to:—

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, Oy! My plant's dying. No! No! Nasty bugs sucking the life from my Thyrgodian Megga Chrisanthodil, making her shrink, wilt and die. I'll soon put a stop to their little game: quick Spray-O-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 to grow". It can't be much longer, won't be long now. Why! you little, little . . . Quickly, get the super space slug spray, and then the leech laser. Quick, Quick. They breed so fast, can't hold them back for long. Hurry! . . . Hurry! . . . Arrggg! . . .

PSSST . . . The ULTIMATE Challenge.

PSSST Arcade standard, 100% machine code, incredible sound effects, amazing smooth high resolution visual graphics, and that totally new addictive concept and all those features you come to expect from the ULTIMATE GAME people.

Now you know why 'ULTIMATE PLAY THE GAME'

PSSST . . . Go grow yourself a REAL game.

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 rocket and then get on to your next destination.

Upon landing, you will find yourself equipped with the very latest Photon Laser Rocket Boots, plus meggo powerful, Quad Photon Laser Guns, but be careful when you collect all the valuables, as they are very heavy and will slow you down.

Hydrovac to blast any nasty, mean, little aliens who might object to your visit. And valuables, such as gold, diamonds or precious gems, are worth lots of points.

Built as well as they are, the rocket ship is so expensive, now's your chance to get rich! You might just be the very first person to collect the odd sock of space travel is, oh so elements or several planets and take them back with you.

JET PAC, mean, little aliens get upset, when you collect all of their valuables, and do those dirty, nasty, things to your ship.

JET PAC Arcade standard, 100% machine code, incredible graphics, the features you expect from the ULTIMATE GAME people.

Now you know why 'ULTIMATE PLAY THE GAME'

JET PAC The game to play all the way.

Design: 'ULTIMATE PLAY THE GAME'

Post this coupon now, to **ULTIMATE PLAY THE GAME, The Green, Ashby de la Zouch, Leicestershire LE6 5JU**

Please send me the following: **PSSST** ☐ **JET PAC** ☐

I enclose PO/cheque for £ . . . . . KEMPSTON Joystick information ☐

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



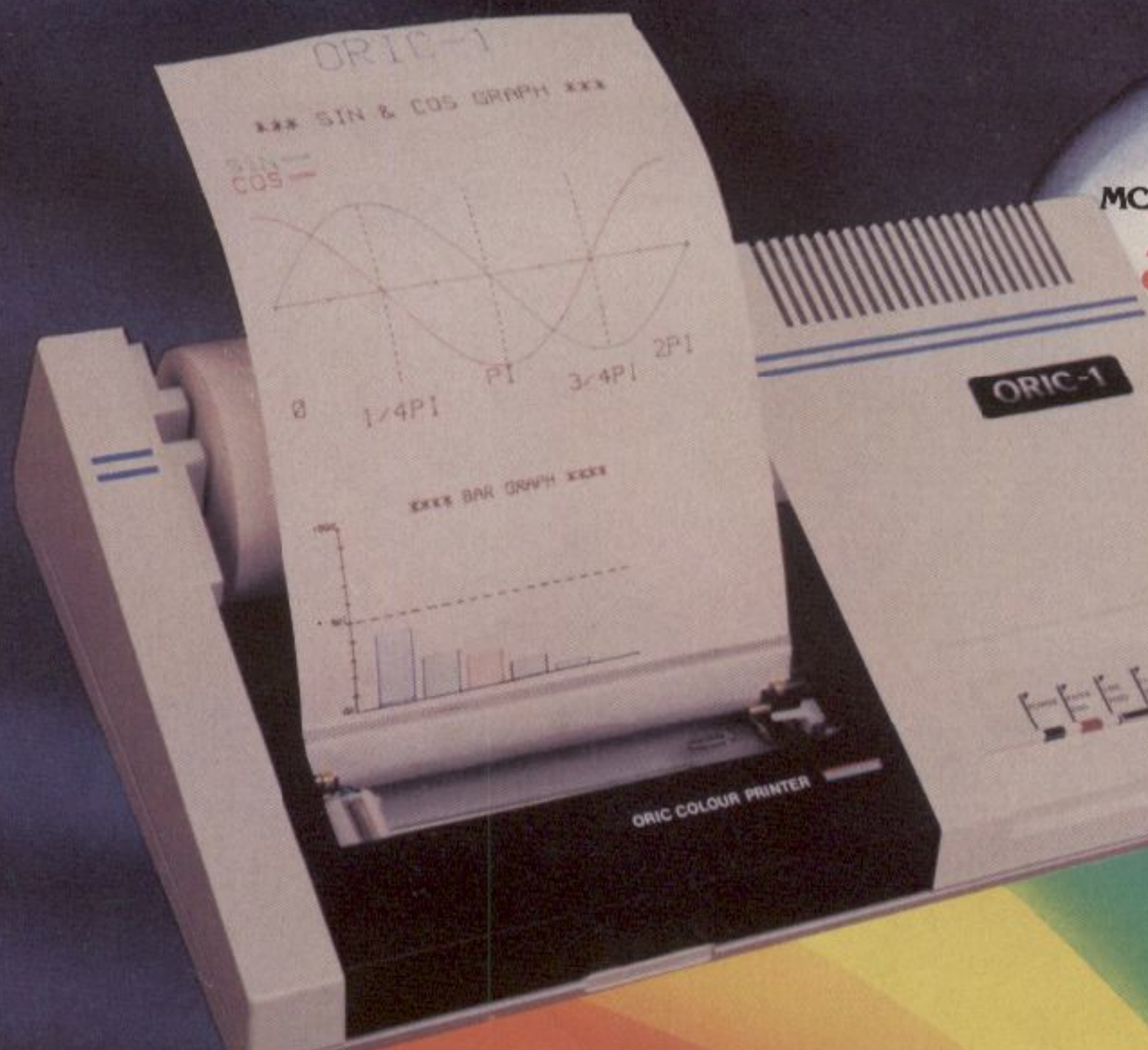
These games should be available from **W. H. SMITH, JOHN MENZIES, BOOTS,** other larger department stores and all major software retailers, alternatively send the coupon to ULTIMATE PLAY THE GAME for immediate dispatch. Subject to availability, you should receive your order within 3 days of posting.

£5.50 each
including VAT, first class postage and packing

Dealership enquiries welcome, phone (0530) 411485

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

ORIC MCP 40 COLOUR PRINTER



ORIC
MCP 40 COLOUR PRINTER
£169.95 incl.V.A.T.

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.V.A.T.
*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.V.A.T.
*TEACH YOURSELF BASIC
HOME FINANCE ORIC FLIGHT
MULTI-GAMES

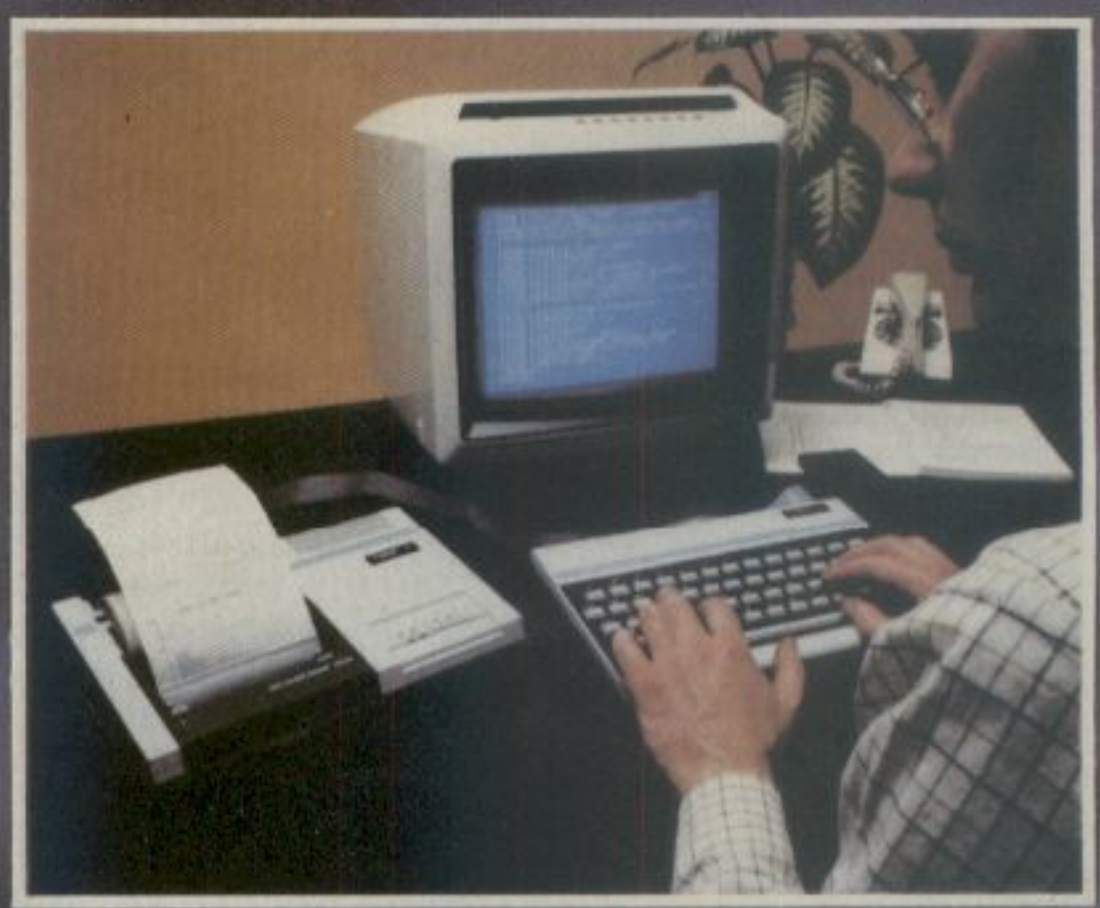
ORIC 1 16K & 48K Micros

- 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 Todays 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

HARDWARE REVIEW

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 forsee 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 verison 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!!!

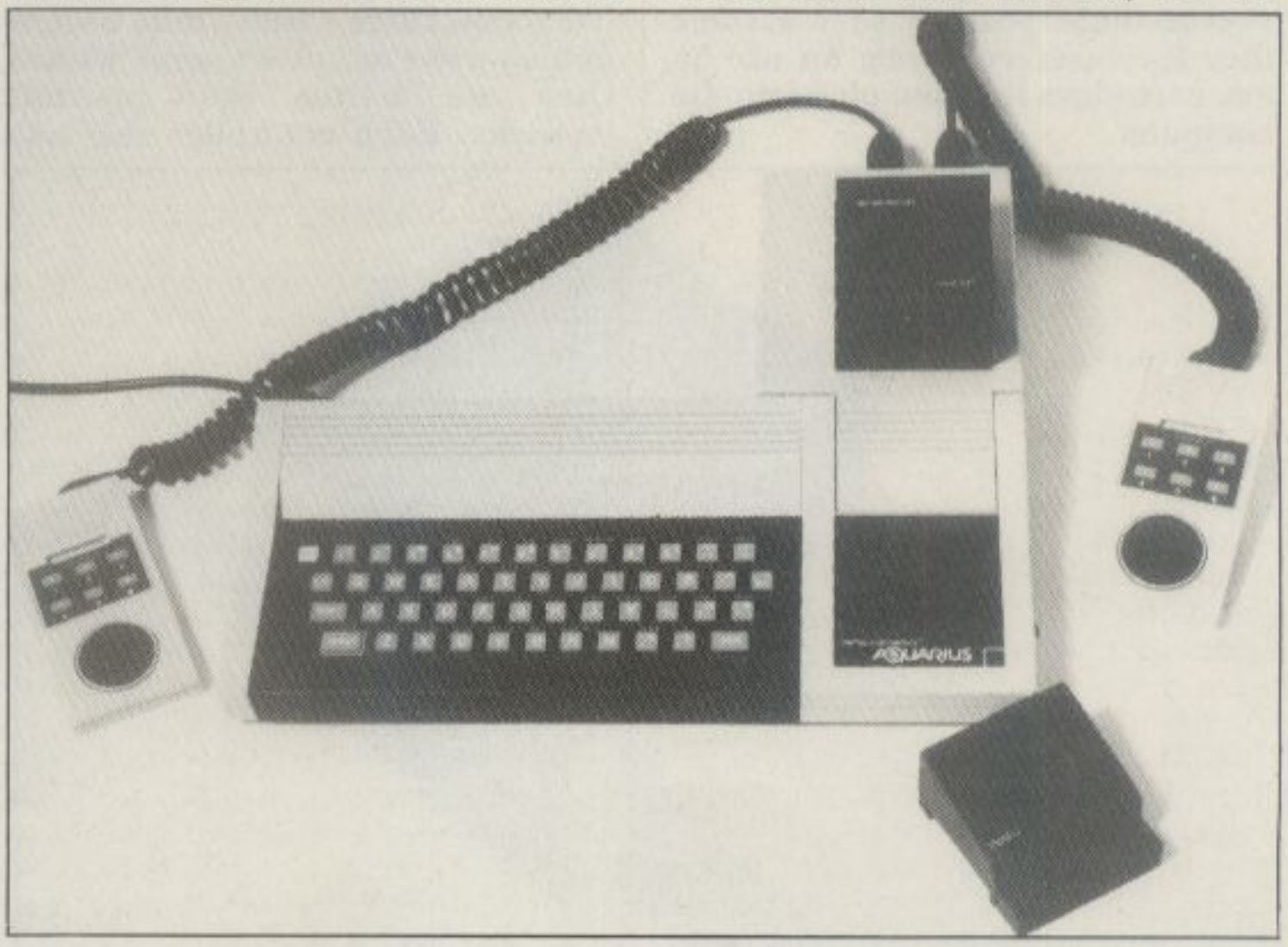
Graphics and Sound

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 predefined 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 × 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.

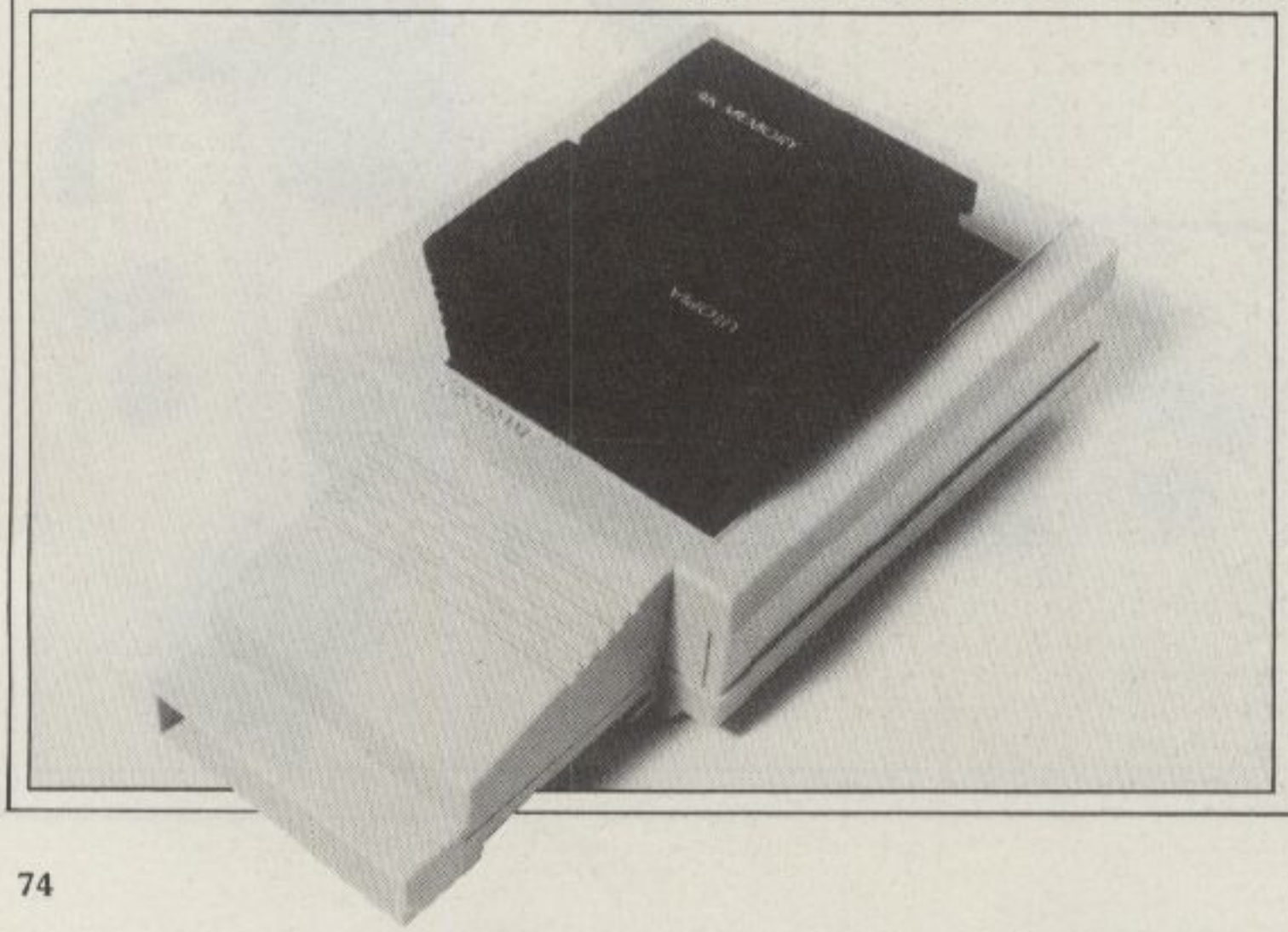
Other expansions that will be available for the Aquarius include a Data Recorder, a Modem cartridge for communications and a master expansion module which will allow the use of discs and the CP/M operating system. At the time of writing no prices had been set for any of these peripherals and all that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

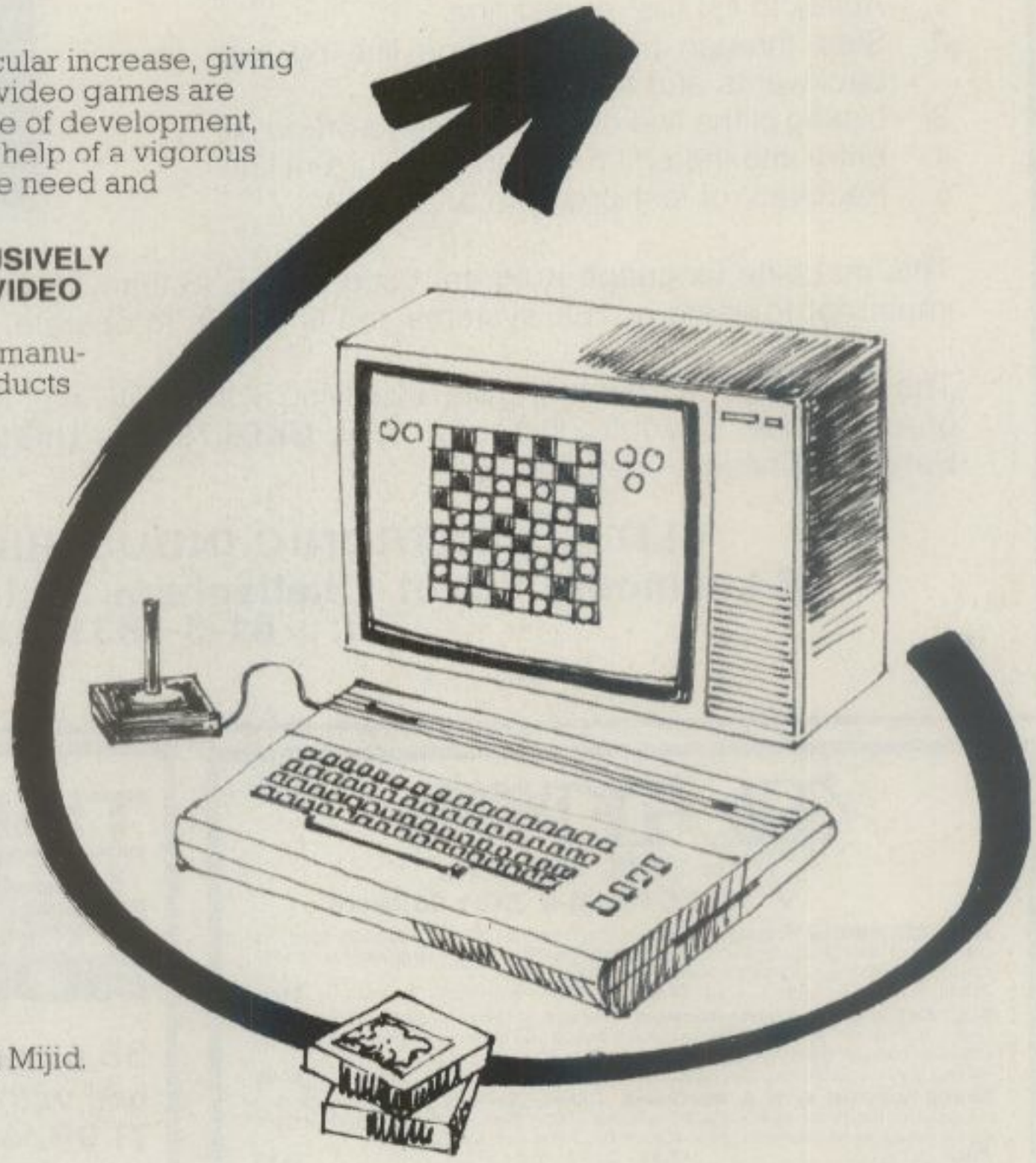
MIJID, BECAUSE YOUR PRODUCTS HAVE GROWN UP...

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 630547 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) 499.2317 – Télex 25230

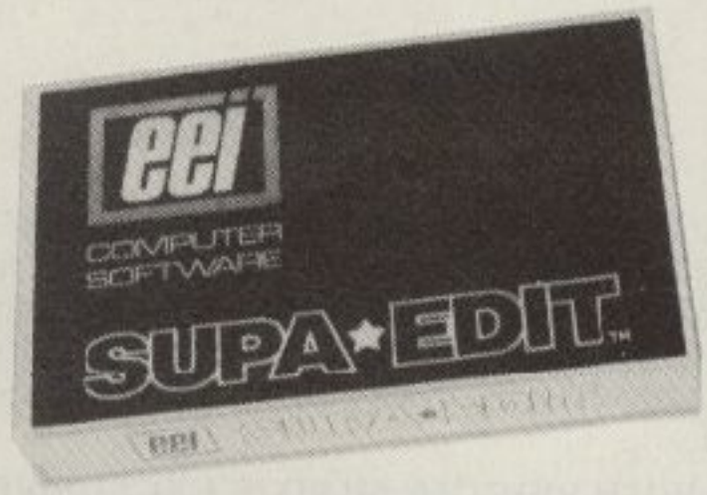
MIJID GB PCT

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 stiength 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 o' unpleasant surprises for those brave enough to try and seek out his riches!! Come face to face with Ghouls and Ghosts, Vampires and Trolls; 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

AT LAST

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.....



ORIC AND SINCLAIR COMPUTERS

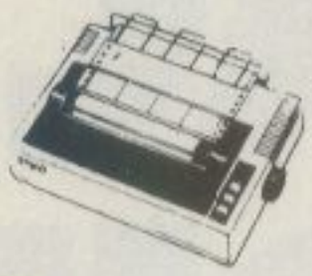
Oric 1 48K computer £147 (£158). Oric 1 16K n/a (n/a). Sinclair Spectrum 48K £113 (£133). Spectrum 16K £86.91 (£107). 32K memory upgrade kit for 16K Spectrum (Issue 2 only) £26.09 (£28). Fuller master unit for the Spectrum including speech synthesizer, sound synthesizer, amplifier and joystick ports £47.78 (£56). ZX microdrive r/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). Convertor 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). Atari 400 16K with basic £173 (£215).



PRINTERS

The Epson MX80FT/3 has been replaced by the almost identical CTI 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). Seikosha GP100A £199 (£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 6100 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.

SOFTWARE & MICROS NOW IN STOCK AT

CLWYD PERSONAL COMPUTERS

Unit 19, Daniel Owen Pricinct, Mold, CH7 1AP.
Telephone: Mold 56842

SPECTRUM 16K & 48K

ATARI® 400 & 800

Commodore 64

VIC 20 & ORIC 1

sinclair ZX81

Software by:

Quicksilver

BUG-BYTE

IMAGINE

Over 200 Software in Stock

DON'T MISS THIS INCREDIBLE OFFER!

50 GAMES



£9·95

YES, 50 GAMES! on cassette for all the following:

GALACTIC ATTACK	MAZE EATER	SUBMARINES
SPACE MISSION	ORBITTER	ROCKET LAUNCH
LUNAR LANDER	MOTORWAY	PLANETS
PLASMA-BOLT	FORCE FIELD	BLACK HOLE
STARTREK	NIM	DYNAMITE
RADAR LANDING	TUNNEL ESCAPE	DO YOUR SUMS
ATTACKER	BARREL JUMP	DERBY DASH
GALACTIC DOGFIGHT	CANNONBALL BATTLE	SPACE SEARCH
ZION ATTACK	OVERTAKE	UNIVERSE
IVASIVE ACTION	SITTING TARGET	RATS
OXO	SMASH THE WINDOWS	TANKER
BOGGLES	SPACE-SHIP	PARACHUTE
PONTOON	JET FLIGHT	JETMOBILE
SKI JUMP	PHASER	HIGH RISE
HANGMAN	INTRUDER	THE FORCE
OLD BONES	INFERNO	EXCHANGE
THIN ICE	GHOSTS	

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 698424

BBC

SOFTWARE

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 alredy 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 Gives green text
VDU131 Gives yellow text
VDU133 Gives magenta text
VDU136 Gives flashing text
VDU141 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 permissable in this mode. The colours used in this program are the logical colours 0 to 3 i.e. black, red, yellow 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:-

VDU5 and VDU4 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.

VDU7 Causes a short beep from the loudspeaker
VDU11 Moves the cursor to the start of the current line
VDU12 Clears the screen
VDU23 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
40	Load database
50-70	Set up screen display, present menu
80	Change order of program execution depending upon option selected
90-110	Executed for option 3; input the character string
120-250	Executed for option 1 and option 3 if the character is to be altered
130	Set cursor keys to produce ASCII codes
150	Plot crosshairs and character
160	Clear all internal buffers
170-230	Check for key pressed. Call appropriate procedures to fill or clear squares or to move crosshairs
240	Put character code into memory
250	Executed for option 2 and option 1 if the VDU string is required
260-290	Executed for option 4 to end the program
300-350	Plots 8x8 grid and small box under the grid to hold the character being worked on
360-410	Sets up the codes 224 to 255 together with any characters which may have already been defined
420-450	Displays the menu
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
600-640	Displays the character on the 8x8 grid
650-670	Plots or unplots the individual squres within the 8x8 grid
680-700	Prints the character in the small box under the 8x8 grid
710-760	Accepts the input of a VDU 23 string from the keyboard, displays the character on the grid and actual size
710-810	Called whenever a yes or no answer is required
820-840	Plots the crosshairs
850-900	Fills or clears an individual square of the grid, alters the code in memory and replots the crosshairs
910-940	POKES the new data into the relevant area of memory
950-1010	Alters the X and Y coordinates for the crosshairs if the cursor keys have been used
1020-1050	Outputs the VDU 23 string of a character
1060-1100	Delays program operation until the space bar is pressed (MODE 1)
1110-1150	Finishing procedure. Saves the new database
1160-1420	Prints instructions
1430-1460	Delays program operation until the space bar is pressed (MODE 7)
1470-1530	Program introduction
1540-1600	Loads data base

	code.
VDU24	Defines graphics window
VDU28	Defines a text window
VDU31,X,Y	This is identical to the usual TAB(X,Y) command
PLOT6,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
PLOT85,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
PLOT87,X,Y	As for PLOT85 but the colour used is the current graphics background colour i.e. it effectively 'unplots' a triangle
CLS	Clears the text window
CHR$(127)	Moves the text cursor back one character and deletes the character at that position
CHR$(11)	Same as VDU11
SPC(X)	Puts X spaces into the PRINT statement
TIME = 0	Sets the internal timer to zero. This increments in 1/100ths of a second
DIV	Integer division
MOD	Returns the remainder after integer division
?(expression) = X	POKES the value of variable X into the memory location given by the expression
X = ?(expression)	PEEKS the memory location given by the expression and returns its contents to the variable X
&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
*FX4,1	This enables the cursor keys to produce ASCII codes (136-139)
*FX4,0	Returns the cursor keys to their normal editing duties
*FX15,0	Flushes all internal buffers
*SAVE"name" C00 D00	Saves the area of memory between &C00 and D00 on cassette. The file is then called 'name'
LOAD"name" C00	Loads the file called 'name' back into memory beginning at location &C00
CHAIN"name"	Loads and runs the program called 'name'
Logical operators	These return the values TRUE or FALSE. These have the numeric values –1 and 0 respectively.

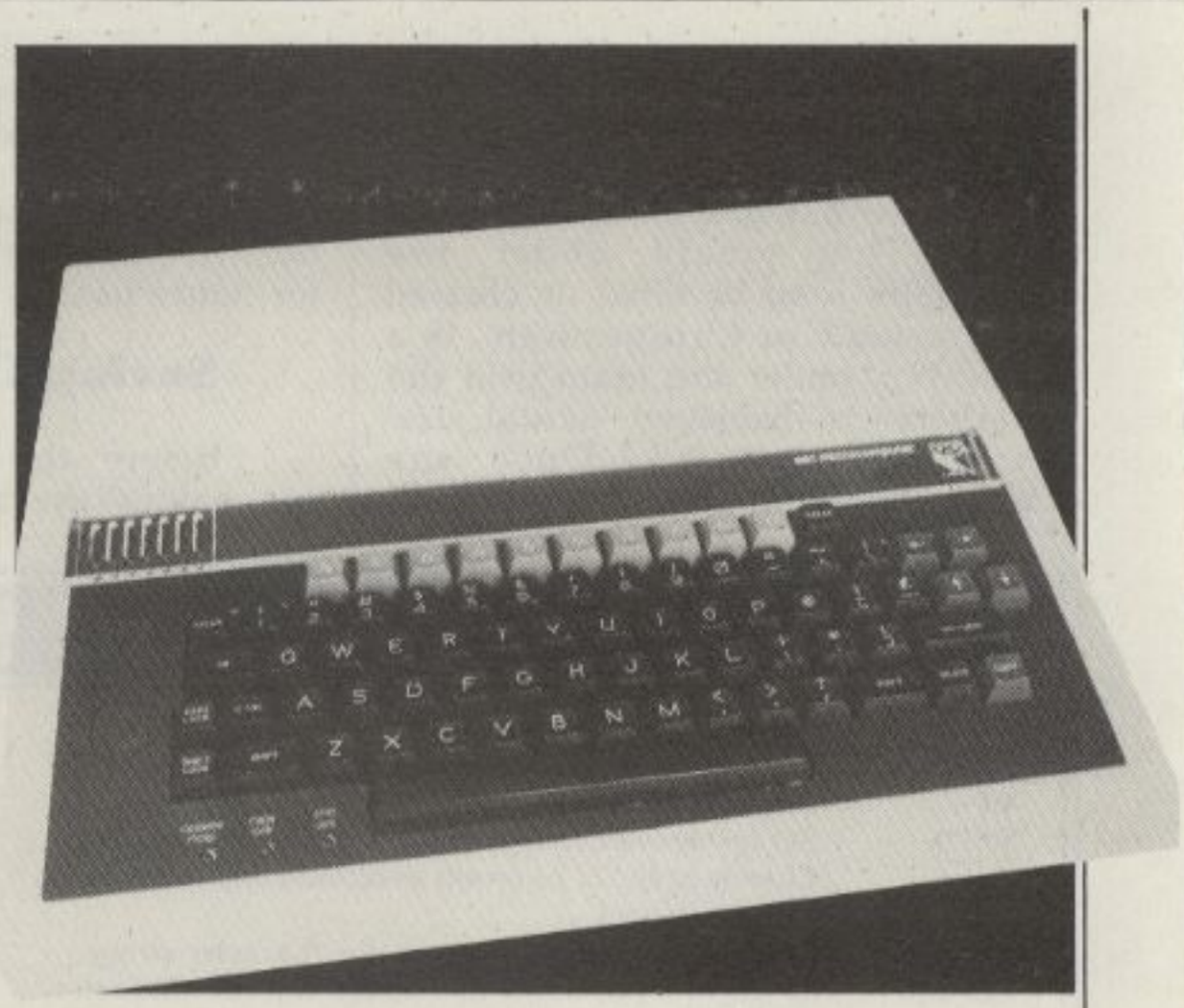
CHARACTER BUILDING

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 the data for the character chr
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 GOTO80 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$="No" THEN GOTO 70
  120X=108:Y=888
  130*FX4,1
  140REPEAT
  150PROC_xhair:PROC_look
  160*FX15,0
  170VDU7:PRINT"COMMAND ":REPEAT move=INKEY(0):UNTIL
move>0:VDU11
  180IF NOT((move<71 AND move>68) OR (move<103 AND mo
ve>100) OR (move<140 AND move>135) OR move=67 OR move
=99) THEN 160
  190IF move=70 OR move=102 THEN PROC_fill(85):ELSE I
F move<100 AND nove<>69 THEN PROC_fill(87)
  200PROC_move
  210UNTIL move=69 OR move=101
  220PRINTTAB(0,27);"Do you want the VDU23 string (Y/
N)":PROC_answer
  230IF ANS$="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:DRAW80,400
  350ENDPROC
  360DEFPROC_codes
  370GCOL0,3:VDU5
  380FORI=1TO16:MOVE544,960-I*32:PRINT(I+223);"  ";CH
R$127;CHR$(I+223);"    ";(I+239);"  ";CHR$127;CHR$(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$11
  490ENDPROC
  500DEFPROC_delay(period)
  510TIME=0:REPEAT UNTIL TIME >period
  520ENDPROC
  530DEFPROC_character
  540COLOUR3:REPEAT:PRINTTAB(0,30);"CHR$ (224-255)= "
;:VDU7
  550INPUT chr:check=chr:PROC_check(224,255):UNTIL C=
0:CLS
  560ENDPROC
  570DEFPROC_string(CHR)
  580CHR=(CHR-224)*8+&C00:FORI=0TO7:MEM(I+1)=?(CHR+I)
```

PROGRAM LISTING

```
:NEXT
  590ENDPROC
  600DEFPROC_display
  610FORI=8TO1 STEP-1:bit=MEM(9-I):FORJ=8TO1 STEP-1:G
RID(J,I)=bit MOD 2
  620IF GRID(J,I)=1 THEN PROC_plot(J,I,1):ELSE PROC_p
lot(J,I,0)
  630bit=bit DIV 2:NEXT:NEXT
  640ENDPROC
  650DEFPROC_plot(x,y,z)
  660GCOL0,3:MOVEx*60+24,y*60+384:MOVEx*60+76,y*60+38
4:PLOT85-2*(z=0),x*60+24,y*60+436:PLOT85-2*(z=0),x*60
+76,y*60+436
  670ENDPROC
  680DEFPROC_look
  690GCOL0,2:VDU5:MOVE96,384:PRINT" ";CHR$127:MOVE96,
384:PRINTCHR$(chr):MOVE400,384:PRINT"   ";CHR$127;CHR
$127;CHR$127;chr:VDU4
  700ENDPROC
  710DEFPROC_instring(CHAR)
  720COLOUR2:PRINTTAB(0,27);"Input the 8 VDU bytes on
e at a time"''
  730FORI=1TO8:VDU7:PRINT"Byte ";I;:REPEAT INPUT MEM(
I):check=MEM(I):PROC_check(0,255):UNTIL C=0:VDU11:PRI
NTSPC(12):VDU11:NEXT:CLS
  740CHAR=(CHAR-224)*8+&C00:FORI=0TO7:?(CHAR+I)=MEM(I
):NEXT
  750PROC_display:PROC_look
  760ENDPROC
  770DEFPROC_answer
  780VDU7:REPEAT ANS$=GET$:UNTIL ANS$="Y" OR ANS$="y"
 OR ANS$="N" OR ANS$="n"
  790IF ANS$="Y" OR ANS$="y" THEN ANS$="Yes' ELSE ANS
$="No"
  800PRINTANS$:PROC_delay(150):CLS
  810ENDPROC
  820DEFPROC_xhair
  830MOVE X-12,Y:PLOT6,X+12,Y:MOVEX,Y-12:PLOT6,X,Y+12
  840ENDPROC
  850DEFPROC_fill(factor)
  860GCOL0,3
  870MOVEX-24,Y-24:MOVEX+28,Y-24:PLOTfactor,X-24,Y+28
:PLOTfactor,X+28,Y+28
  880GRID(INT(((X-108)/60)+1),INT(((Y-468)/60)+1))=-1
*(factor=85)
  890PROC_memplace:PROC_xhair
  900ENDPROC
  910DEFPROC_memplace
  920M=0:I=INT(((Y-468)/60)+1):FORJ=8TO1 STEP-1:M=GRI
D(J,I)*(2^(8-J))+M:NEXT:I=8-I
  930?((chr-224)*8+&C00+I)=M:PROC_look
  940ENDPROC
  950DEFPROC_move
  960PROC_xhair
  970X=X+60*(move=136)-60*(move=137)
  980IF X<110 THEN X=110 ELSE IF X>530 THEN X=530
  990Y=Y+60*(move=138)-60*(move=139)
 1000IF Y<470 THEN Y=470 ELSE IF Y>890 THEN Y=890
 1010ENDPROC
 1020DEFPROC_outstring
 1030COLOUR2:PRINTTAB(0,27);"The VDU string is :_"':C
OLOUR1:PRINT"VDU23,";chr;
 1040FORI=1TO8:PRINT",";MEM(I);:NEXT:PRINT'':PROC_con
tinue
 1050ENDPROC
 1060DEFPROC_continue
 1070COLOUR2:VDU7
 1080PRINTTAB(0,30);"<PRESS SPACE BAR TO CONTINUE>"
 1090REPEAT UNTIL GET=32:CLS
 1100ENDPROC
 1110DEFPROC_finish
 1120COLOUR1:PRINTTAB(0,25);"Insert blank cassette in
to recorder in"'"order to save new database.":COLOUR2
:VDU7,7
 1130*SAVE"DATA_1" C00 D00
 1140COLOUR1:PRINTTAB(0,30);"Database recorded.":VDU7
,7:PROC_delay(200):VDU12
 1150ENDPROC
 1160DEFPROC_instruct
 1170VDU131:PRINT"This program will allow you to defi
ne"
 1180VDU131:PRINT"the characters 224 to 255 and save
the"
 1190VDU131:PRINT"results on tape."'
 1200VDU131:PRINT"When the program is loaded initiall
y"
 1210VDU131:PRINT"all the characters will be blank th
us"
 1220VDU131:PRINT"allowing you to build up a data bas
e"
 1230VDU131:PRINT"_ or data bases _ of useful defined
"
 1240VDU131:PRINT"characters."'
 1250VDU131:PRINT"Alternatively, a VDU23 string may b
e"
 1260VDU131:PRINT"input directly and the resulting"
 1270VDU131:PRINT"character will be displayed on the"
 1280VDU131:PRINT"screen.  This may then be altered o
r"
 1290VDU131:PRINT"saved as you wish."'
 1300VDU131:PRINT"For all options, whenever an input"
 1310VDU131:PRINT"is required, a short beep will be"
 1320VDU131:PRINT"heard from the loudspeaker."'
 1330PROC_cont
 1340VDU31,2,2,131:PRINT"In order to alter or define
the"
 1350VDU131:PRINT"character presented on the grid, us
e"
 1360VDU131:PRINT"the cursor keys to move the crossha
irs"
 1370VDU131:PRINT"to the correct position and then us
e"
 1380VDU131:PRINT"C....to clear the square"
 1390VDU131:PRINT"F....to fill the square or"
 1400VDU131:PRINT"E....to end"
 1410PROC_cont
 1420ENDPROC
 1430DEFPROC_cont
 1440VDU31,2,23,7,130:PRINT"<Press space bar to conti
nue>"
 1450REPEAT UNTIL GET=32:CLS
 1460ENDPROC
 1470DEFPROC_intro
 1480VDU31,5,10,141,130:PRINT"USER DEFINED GRAPHICS"
 1490VDU31,5,11,141,130:PRINT"USER DEFINED GRAPHICS"
 1500VDU31,2,15,136,133:PRINT"<Turn cassette recorder
 off>":VDU7,7
 1510PROC_cont
 1520PRINT"Do you want instructions (Y/N) ?":PROC_ans
wer:IF ANS$="Yes":PROC_instruct
 1530ENDPROC
 1540DEFPROC_load
 1550VDU31,0,14,133:PRINT"Turn cassette recorder on t
o load"
 1560VDU133:PRINT"database.":VDU7,7:PROC_cont
 1570*LOAD"DATA_1" C00
 1580VDU31,7,12,130:PRINT"Database is now loaded."
 1590VDU31,3,17,133:PRINT"<Turn cassette recorder off
>":VDU7,7,7:PROC_cont
 1600ENDPROC
>
```



AGF

PROGRAMMABLE JOYSTICK INTERFACE

for

sinclair ZX Spectrum 81

ONLY 32.95 +£1.00pp

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.

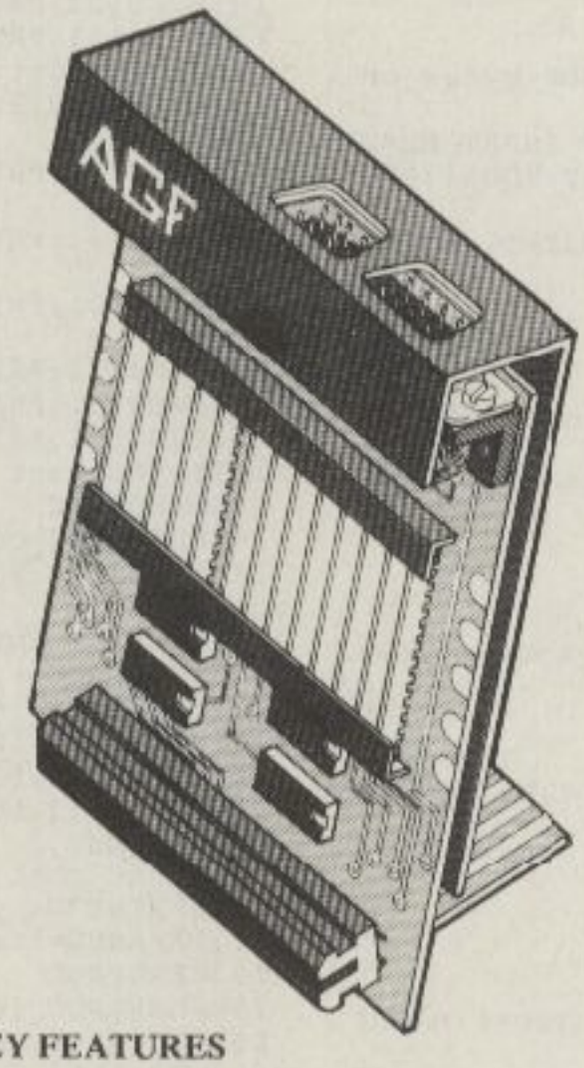
Quick clip-on connections, which are configured from a reference card supplied, allow you to define which of the forty keys are simulated by which action of the Joystick. A pack of ten Quick Reference Programming Cards makes setting for your favourite games even easier. These can be filled in to show 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	
		FINAL TOTAL	

ZX81 ☐ ZX SPECTRUM ☐ Please tick

DEALER ENQUIRIES WELCOME *EXPORT PRICES ON APPLICATION*

THE GAMES YOU'VE BEEN DYING TO SEE!

For the Unexpanded VIC-20

TVIC 3 Skramble!	**£7.95**
TVIC 4 Terminal Invaders	**£5.95**
TIVC 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 Oddessey: 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, cr 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

FACTFILE

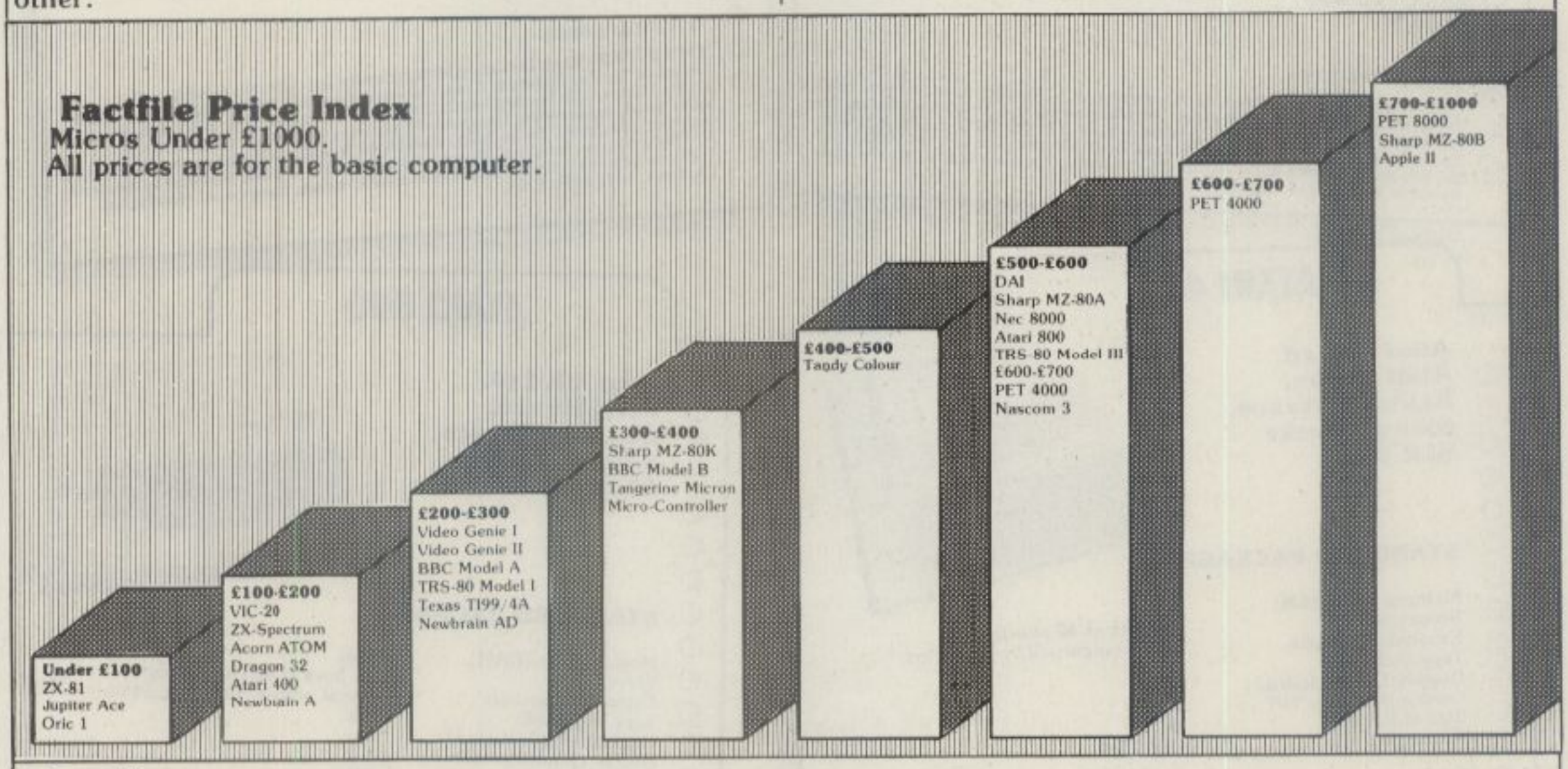
MICRO FACTFILE

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 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

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.

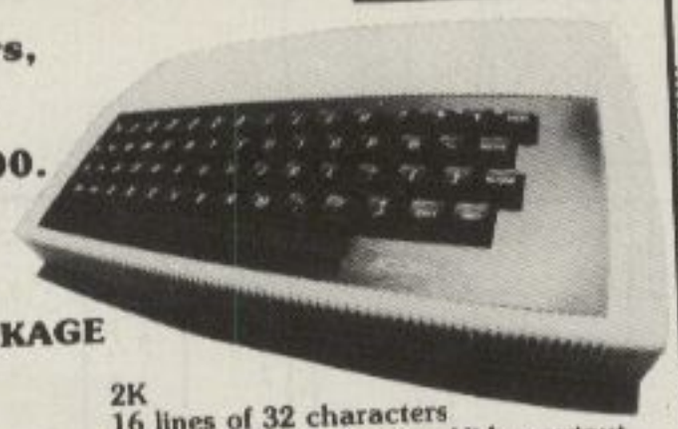
SERIAL/PARALLEL OUTPUT: This refers to the manner in which the micro transmits data to other units. If it puts out information in a long string, one bit after another, down a single wire or connector, it is a serial output. Parallel output is where pins or wires carry information simultaneously and are '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.

FACTFILE

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	£232
Monitor	No	—
Disc Drives	Yes	£299
Other Languages	Yes	£11.50
Multi-user Capabilities	Yes	—
BASIC extensions (Toolkits)	Yes, BBC BASIC	£50

OTHER ADD-ONS:

Centronics-type connector, Technomatic Ltd, 17 Burnley Road, London NW10, £8.50; **TMS 5100 Talking Board,** GM Microtronics Ltd, Unit 14, Godinton Way Industrial Estate, Godinton Road, Ashford, Kent, £82.95; **DUO-1 64K add-on,** Audio Computers, 87 Bournemouth Park Road, Southend-or-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 Capabilities	No	—
BASIC extensions (Toolkits)	Yes	£26

OTHER ADD-ONS:

TMS 5100 Talking Board, GM Microtonics Ltd, Unit 14, Godinton Way Industrial Estate, Godinton Road, Ashford, Kent, £82.95; **Multifunction Card,** Datex Micros, 193 Touring Road, Worthing, W. Sussex, £85; **5¼" 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

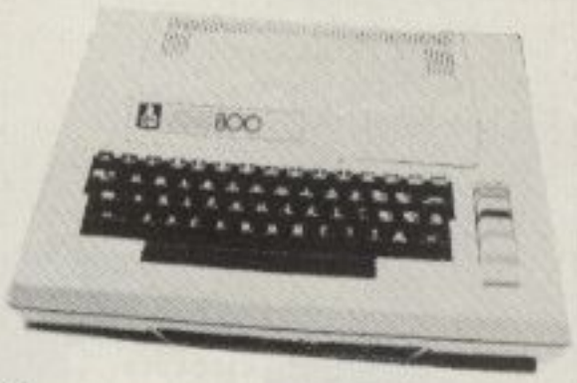
	DETAILS	PRICE
RAM	No	—
Printer	Yes	£199.90
Monitor	No	—
Disc Drives	Yes	£299.99
Other Languages	Yes	£39-79
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	Yes	TBA

OTHER ADD-ONS:

TMS 5100 Talking Board, GM Microctonics Ltd, Unit 14, Gcdinton Way Industrial Estate, Gcdinton 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

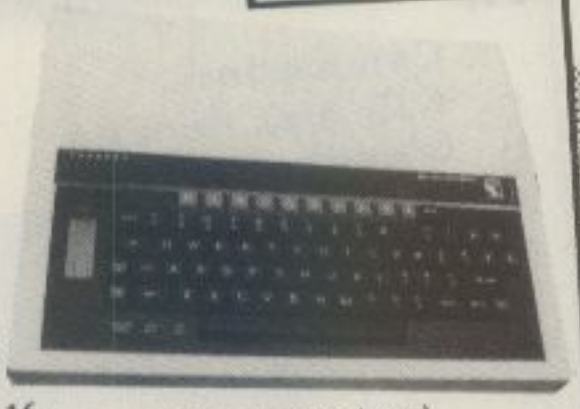
	DETAILS	PRICE
RAM	Yes	£199.99
Printer	No	—
Monitor	Yes	£299.99
Disc Drives	Yes	£39.79
Other Languages	No	—
Multi-user Capabilities	Yes	TBA
BASIC extensions (Toolkits)		

OTHER ADD-ONS:

TMS 5100 Talking Board, GM Microtonics 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	£200
Monitor	Yes	—
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,** Microage Electronics, 135 Hale Lane, Edgeware, 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,** Midwich Computer Co Ltd, Newitt House, Northgate Street, Bury St. Edmunds, Suffolk IP33 1HQ, £42.50; **Analogue Joystick, Light Pen,** Slack 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?	Yes
Size of BASIC	16K
Average Price	**£399**

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	TBA	TBA
Monitor	No	—
Disc Drives	TBA	TBA
Other Languages	TBA	TBA
Multi-user 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 503121, £199-799; **BBC Cassette recorder,** Microage Electronics, 135 Hale lane, Edgware, Middx, HA8 9QP, £28; **Colour Monitor,** Portatel Conversions Ltd, 25 Sunbury Cross Centre, Saires 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, £82.95; **64K DRC Module,** Audio Computers, 87 Bournemouth Park Road, Southend-on-sea SS5 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	—

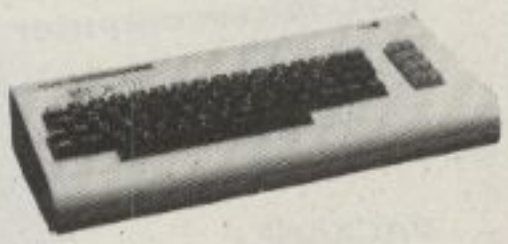
OTHER ADD-ONS:

Universal Interface, Technomatic Ltd, 17 Bunley Road, London NW10, £149; **TMS 5100 Talking Board,** GM Microtronics Ltd, Unit 14, Godinton Way industrial Easte, Godinton Road, Ashford, Kent, £82.95; **64K DRC Module** Audio Computers, 87 Bournemouth Park Road, Southend-on-sea SS5 2JJ, £70 kit, £80 built.

FACTFILE

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

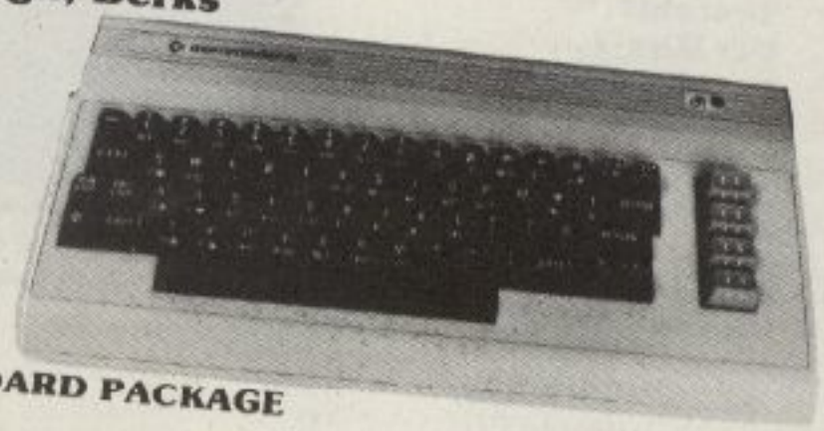
	DETAILS	PRICE
RAM	3K,8K,16K expansion options	£30,£45,£75
Printer	Yes	£270
Monitor	No	—
Disc Drives	Yes	£396
Other Languages	Yes	£38.95
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

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, Gibyn 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**

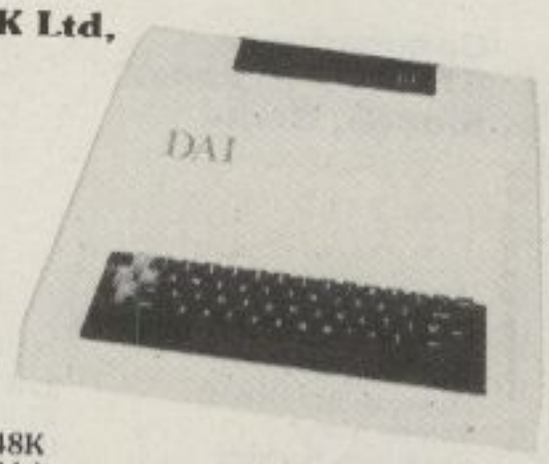
MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	Yes	£230-276
Monitor	No	—
Disc Drives	Yes	£299
Other Languages	Yes	—
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)	TBA	—
	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 Capabilities	No	—
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, Kiln Lane, Laugharne, Covnathen, 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 Capabilities	No	—
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	—
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:

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

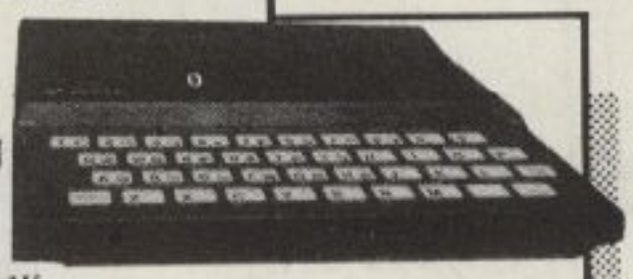
	DETAILS	PRICE
RAM	No	—
Printer	Yes	£450-800
Monitor	N/A	—
Disc Drives	Yes, dual	£600
Other Languages	Yes	£45 upwards
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

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, Ashtead, Surrey; £59.95; **Key Bleep Unit,** Microtronix, 3 Buxton Avenue, Coulton, Nottingham, NG4 3KK, £8.85 kit, £9.95 built; **Maximem 1.1,** East London Robotics, Finlandia House, 14 Darwell Close, East Ham, London, EB4 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, Ashtead, 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 RAN,** 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, Cumara 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; **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

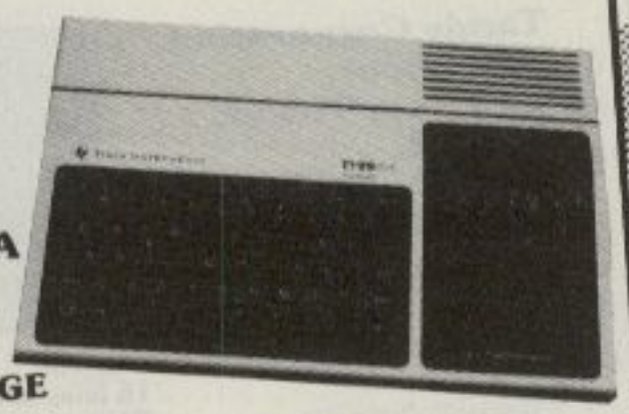
	DETAILS	PRICE
RAM	No	—
Printer	Yes various	£239-1200
Monitor	No	—
Disc Drives	Yes	£439
Other Languages	No	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Olivetti disc drives single and dual, Kram Electronics, Victoria House, 17 Highcross St., Leicester LE1 4PF, £179-349.

FACTFILE

TEXAS TI 99/4A



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**

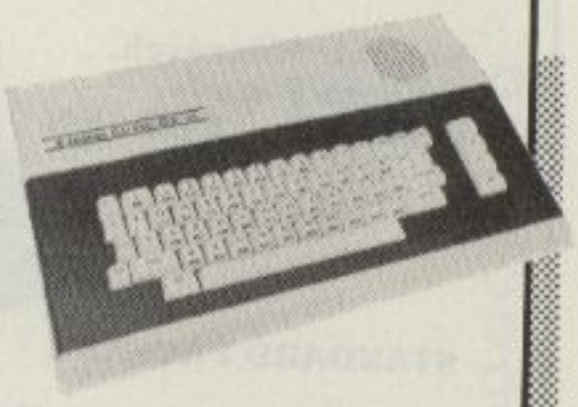
MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	up to 48K (max)	£300
Printer	Yes	£275
Monitor	No	—
Disc Drives	Yes	£300
Other Languages	Yes	£50-£100
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	Yes	£100

OTHER ADD-ONS:

Speech Synthesiser, Texas Instruments, £46.60; **Terminal Emulator II,** Texas Instruments, £37.80; **RS232 Interface,** Texas Instruments.

COLOUR GENIE



Lowe 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 Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

VIDEO GENIE I



Lowe 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**

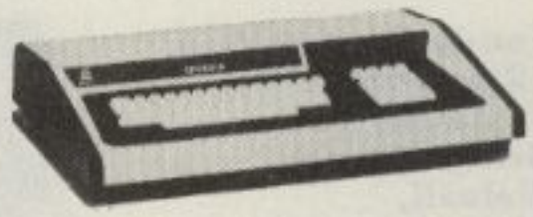
MANUFACTURER'S EXPANSIONS

	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 Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Disc drives, single and dual, Cumara Ltd, 35 Walnut Tree Close, Guildford, Surrey GU1 4UN, £199-799; **Olivetti disc drives single and dual,** Kram Electronics, Victoria House, 17 Highcross St, Leiscester 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, GNOMIC, 46 Middle Street, Blackhall, Martlepool, Cleveland, £70+VAT: **32K RAM Card** Audio Computer, 87 Bournmouth Park Road, Southend-on-sea, SS5 2JJ, £40 kit, £46 built.

VIDEO GENIE II



Lowe 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?	No
Usable Domestic TV?	Yes
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 Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Disc drives, single and dual, Cumana Ltd, 35, Walnut Tree Close, Guildford, Surrey, Gul 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, 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.

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

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

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 youstay 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.

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

FREE catalogue

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 on 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, Colnbrook, Slough, Berks, SL3 0QH.

They came suddenly — without warning — they attacked out 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 developec 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

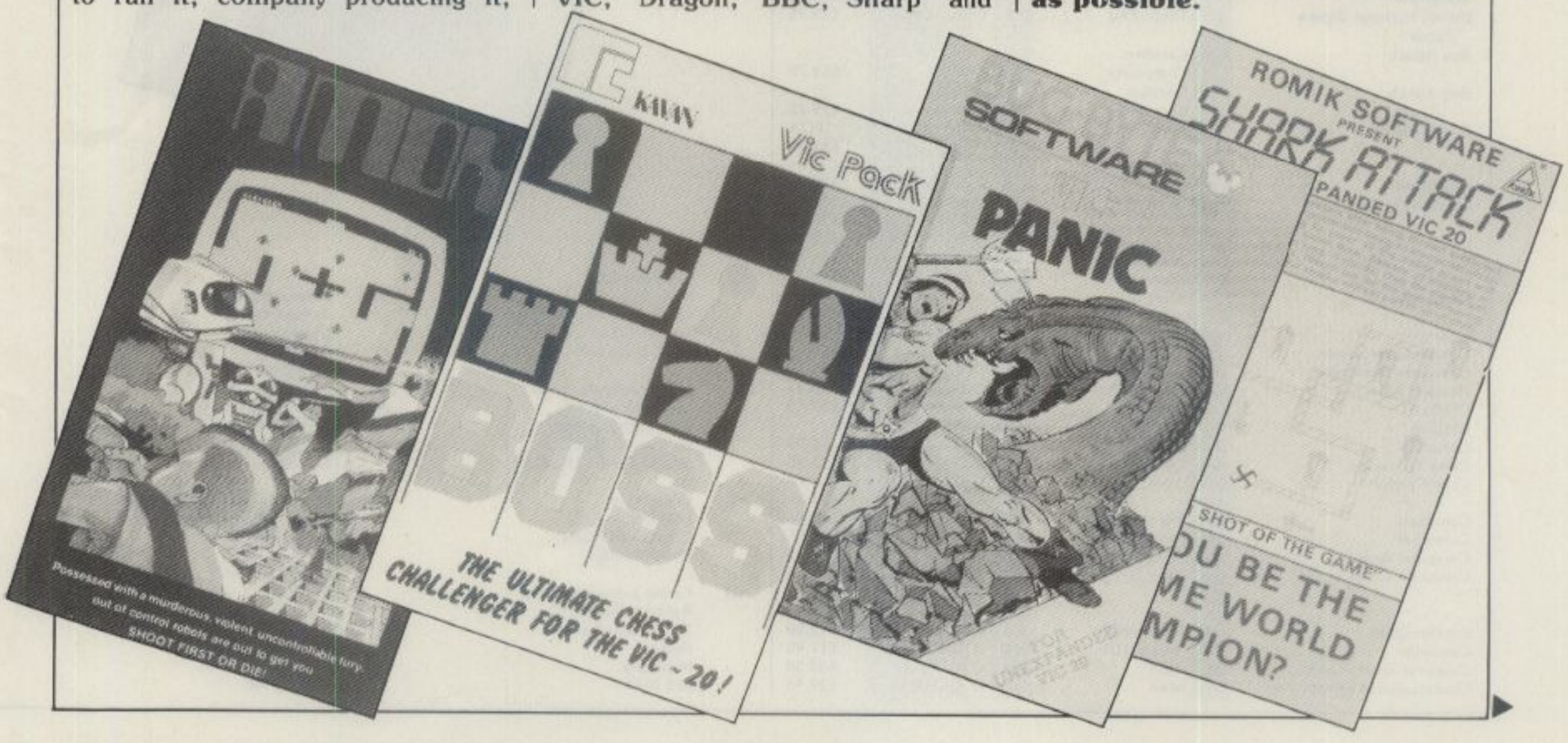
How Sold

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 LISTING

ATARI

Title	Program Type	Program Produced By	Memory Req'd	How Sold	Supplier Codes	Prices
Air Strike	Gm	English S/W	16K	C	CH,HM	£15.95
Ali Baba	Gm	Quality S/W	32K	D	HM	£22.95
Alien Hell	Gm	Syncro	24K	D	JR	£16.95
Alien Hell	Gm	Syncro	16K	C	JR	£13.95
Alpha Fighter	Gm	Dinacomp	24K	C	AB,IK	£11.99
Analog Adventure	Gm		32K	D	BC	£34.95
Angle Worms	Gm	Adventure Int.	8K	C	AB,IK	£12.50
Ants Hill	Gm	Atari	8K	C	GC	POA
					AB	£11.25
Armoured Patrol	Gm	Adventure Int.	16K	C	AB	£16.50
Arcade Baseball	Gm	Arcade Plus	16K	C	JR	£18.95
Arcade Baseball	Gm	Arcade Plus	16K	D	JR	£20.95
Assembler Editor	Ut	Atari		R	AB,HM	£39.95
Assembler	Ut	Quality S/W	16K	C	BC	£14.95
Assembler Editor	Ut	United S/W of America	16K	R	BC	£34.50
Asteroids	Gm	Atari	16K	R	AC, BC,CH, HM,IK	£29.95
					BC	£18.95
Atari Word Processor	Bs	Atari	32K	C	AB	£95.95
Atari Word Processor	Bs	Atari	32K	C	BC	£85.00
Atari Word Processor	Bs	Atari	32K	D	HM	£99.95
Atari World Graphics	Ut	United S/W of America	48K	D	BC	£43.95
Avalanche	Gm	Atari	16K	C	GC	POA
					CH	£13.95
					AB	£16.75
Babel	Gm	Atari	16K	C	GC	POA
					AB,IK	£16.75
Balrog Sampler	Gm	Adventure Int.	32K	C	AB	£24.95
Basic A Plus	Ut	OSS S/W	48K	D	BC	£52.50
Basic A Plus and Operating System A	Ut	OSS S/W	48K	D	BC	£99.50
Basic Program Compress.	Ut	Atari	32K	D	AB	£16.75
Basic Utility/Renumber	Ut	Atari	16K	C	AB	£16.75
Basics of Animation	Ed	Santa Cruz	24K	D	BC	£10.95
Basics of Animation	Ed	Atari	16K	C	BC	£9.95
Basics of Animation	Ed	Santa Cruz	16K	C	AB	£13.95
Basketball	Gm	Atari	16K	C	AC,HM,IK	£24.50
Basketball	Gm	Atari	16K	R	AB,BC,IK	£29.95
Beta Fighter	Gm	Allrian	16K	C	JS	£15.50
Beneath the Pyramids	Gm	Chrystal	48K	C	CH,AB,IK	£19.99
Beta Fighter	Gm	Artworx	16K	C	JR	£13.95
Beta Fighter	Gm	Artworx	16K	D	JR	£16.50
Black Jack	Gm	Atari	16K	C	GC	POA
					AC,BC	£8.95
					AB,HM,IK	£9.95
Black Jack Shooter	Ed	Atari	16K	C	AB	£16.75
Bob's Business	Bs	Santa Cruz	16K	C	AB	£9.95
Bridge 2.0	Gm	Allrian	24K	C	JS	£16.00
British Heritage Jigsaw Puzzle	Gm	Thorn EMI	16K	C	BC,HM,IK	£19.95
Bug Attack	Gm	Cavalier Computers	16K	C	JR	£19.25
Bug Attack	Gm	Cavalier Computers	16K	D	JR	£19.25
Bumper Pool	Gm	Atari	16K	C	GC,IK	POA
					AB	£11.25
Calculator	Bs	Atari	24K	D	BC,IK	£16.95
Canyon Climber	Gm	Datasoft	16K	D	HM	£20.00
				C	JR	£18.95
				D	JR	£19.25
Caverns of Mars	Gm	Atari	16K	C	BC,HM,IK	£24.50
Caverns of Mars	Gm	Atari	16K	C	BC,HM,IK	£24.50
Centipede	Gm	Atari	16K	R	GC	POA
					BC,HM,IK	£29.95
Champelo	Gm	Dinacomp	16K	C	AB,IK	£10.99
Character Generator	Ut	Data Soft	16K	C	BC	£9.97
Character Generator	Ut	Data Soft	16K	D	BC	£12.50
Checker Kim	Gm	Personal S/W	16K	C	BC	£15.95
Chicken	Gm	Synapse	16K	C	HM	£19.95
Chicken	Gm	Synapse	16K	D	£19.95	
Chrystals	Gm	Dinacomp	24K	C	AB,IK	£9.99
Close Encounter	Gm	Concom	16K	C	JR	£13.95
Code Cracker	Gm	Atari	8K	C	GC	POA
					AB	£11.25
Commbat	Gm	Adventure Int	24K	C	JR	£12.95
Commbat	Gm	Adventure Int	24K	D	JR	£16.95
Computer Acquire	Gm	Avalon Hill	16K	C	GB	£17.25
Computer Chess	Gm	Atari	16K	R	GC	POA
					CH,AC,HM	
					AB,BC	£24.95
Conflict 2500	Gm	Avalon Hill		C	GB,AB	£12.50
Controller	Gm	Avalon Hill	32K	D	BH	£17.95
Conversational French	Ed	Atari	16K	C	AC,BC,IK	£32.50
Conversational French	Ed	Atari	16K	R	AB,HM,IK	£39.95

SOFTWARE DEALERS

Supplier Code

AA Micro Centre Ltd
30 Dundas Street
Edinburgh EH3 6JN
031 556 7354

AB Micro and Video Palace
62-64 Kensington High Street
London W8
01 937 8587

AC Laskys
7-9 Queensway
London W23RX
01 200 0444

AD Datarite Terminals Ltd
Caldare House
144-146 High Street
Chadwell Heath
Essex RM6 6NT
01 590 1155

AI Microvalue
Computer Interfacing & Equipment Ltd
The Micro Spares Shop
19 Roseburn Terrace
Edinburgh EH12 5NG
(031) 337 5611

AJ Molimerx Ltd
A J Harding
1 Buckhurst Road
Town Hall Square
Bexhill-On-Sea
East Sussex
(0424) 220391/223636

AK GW Computers Ltd
55 Bedford Court Mansions
Bedford Avenue
London WC1
01 636 8210/631 4818



AE Vincelord Ltd
Suite 2
26 Charing Cross Road
London WC2
240 0213/0217

AF Micro Computer Land
Shropshire House
2-10 Capper Street
London WC1E 6JR
01 637 4078/948 6411

AG Comart Ltd
St Neots
Cambs PE19 3JG
(0480) 215005

AH Cream Computer Shop
Rabbit Software
380 Station Road
Harrow
Middlesex
863 0833

AL Acornsoft Ltd
4a Market Hill
Cambridge
CB23NJ
0223 316039

AM Acorn Computers
Fulbourne Road
Cherry Hinton
Cambridge

AN Microcomputer Products Int.
8 Cambridge House
Cambridge Road
Barking
Essex 1G11 8NT
591 6511

AO Xitan Systems
23 Cumberland Place
Southampton S01
0703 38740

Conversational German	Ed	Atari	16K	C	AC,BC,IK	£32.50
Conversational German	Ed	Atari	16K	R	AB,HM,IK	£39.95
Conversational Italian	Ed	Atari	16K	R	AB,HM,IK	£39.95
Conversational Italian	Ed	Atari	16K	C	AC,BC,IK	£32.50
Conversational Spanish	Ed	Atari	16K	R	AB,HM,IK	£39.95
Conversational Spanish	Ed	Atari	16K	C	AC,BC,IK	£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,IK	£15.50
Crush, Crumble, Chomp	Gm	Avalon Hill	16K	D	GB,IK	£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	Do	Atari	32K	D	AB	£20.50
Datestone of Ryn	Gm	Avalon Hill		D	GB,IK	£15.50
Datestone of Ryn	Gm	Avalon Hill		C	BC	£14.95
					GB,IK	£13.50
Deadline	Gm	Infocom	32K	C	JR	£34.50
Deflections	Gm	Adventure Int.	8K	C	AB,IK	£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
Empire of the Overmind	Gm	Avalon Hill		D	GB,AB	£24.95
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	£8.95
					AB,HM,IK	£9.95
European Scene Jigsaw Puzzle	Gm	Thorn EMI	16K	C	BC,HM,IK	£19.95
Extended WSNA	Ut	Atari	16K	C	AB	£19.00
Fantasy land 2041	Gm	Chrystal	48K	C	CH,AB,IK	£34.99
Fastgammon	Gm	Quality S/W	16K	C	BC	£9.95
Forest Fire	Gm	Dinacomp	24K	C	AB,IK	£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,IK	£16.50
Galactic Guest	Gm	Chrystal	48K	C	CH,AB,IK	£19.99
Galactic Trader	Gm	Adventure Int.	32K	C	AB,CH,IK	£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,IK	£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,IK	£11.95
					AB,HM	£13.95
Graphic Sound Demo	Gm	Atari	16K	D	GC	POA
					AB	£16.75
Graphics Machine	Ut	Santa Cruz	16K	C	AB	£13.50
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	£8.95
					AB,HM,IK	£9.95
Hickory Dickory Dock	Gm	Thorn EMI	16K	C	BC,HM,IK	£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,IK	£19.99
Humpty Dumpty/Jack & Jill	Gm	Thorn EMI	16K	C	BC,HM,IK	£19.95

SOFTWARE DEALERS

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
Wedgnock 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



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

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

BF Micro Technology
Royal Sussex Assembly Rooms
The Pantiles
Tunbridge Wells
Kent
0892 32116

BG Elcon Research Ltd
Viking Way
Banhill
Cambridge CB3 8EZ
0954 81825

BH Avalon Hill Games
650 High Sreet
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	GB,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 Prol. 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	POA
					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	Artsci 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	£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	Budgeco	32K	C	HN	£22.95
Rescue at Rigel	Gm		32K	C	BC,IK	£22.45
Reversi	Gm	Artsci 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	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 Billards	Gm	Thorn EMI	16K	C	BC,HM,IK	£19.95
Sound Editor	Gm	Atari	16K	C	GC	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 M,BC,IK	
Space Tilt	Gm	Dinacomp	16K	C	AB,IK	£29.95
Space Trap	Gm	Allrian	16K	C	JS	£15.50
Space Trap	Gm	Dinacomp	24K	C	AB,IK	£9.99
Space Trek	Gm	Atari	24K	C	CC	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	£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	£8.95
					AB,HM	£9.95
Statistics 1	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
Richmcnd
Surrey
940 5194

BJ Lifeboa: Associates
PO Box 125
London WC2H 9LU
836 9028

BK L & J Computers
192 Honey Pot Lane
Queensbury
Stanmcre
Middlesex HA7 1EE
204 7525

BL Peach Tree Software
International
MSA House
99 King Street
Maidenhead
Berks
0628 7:011

BM ACT (Microsoft) Ltd
Freepost
Birmingham B16 8BR
(David Low)
021 454 8585

BR IBR Microcomputers
Suttons Industrial Park
London Road
Earley
Reading
0734 664111

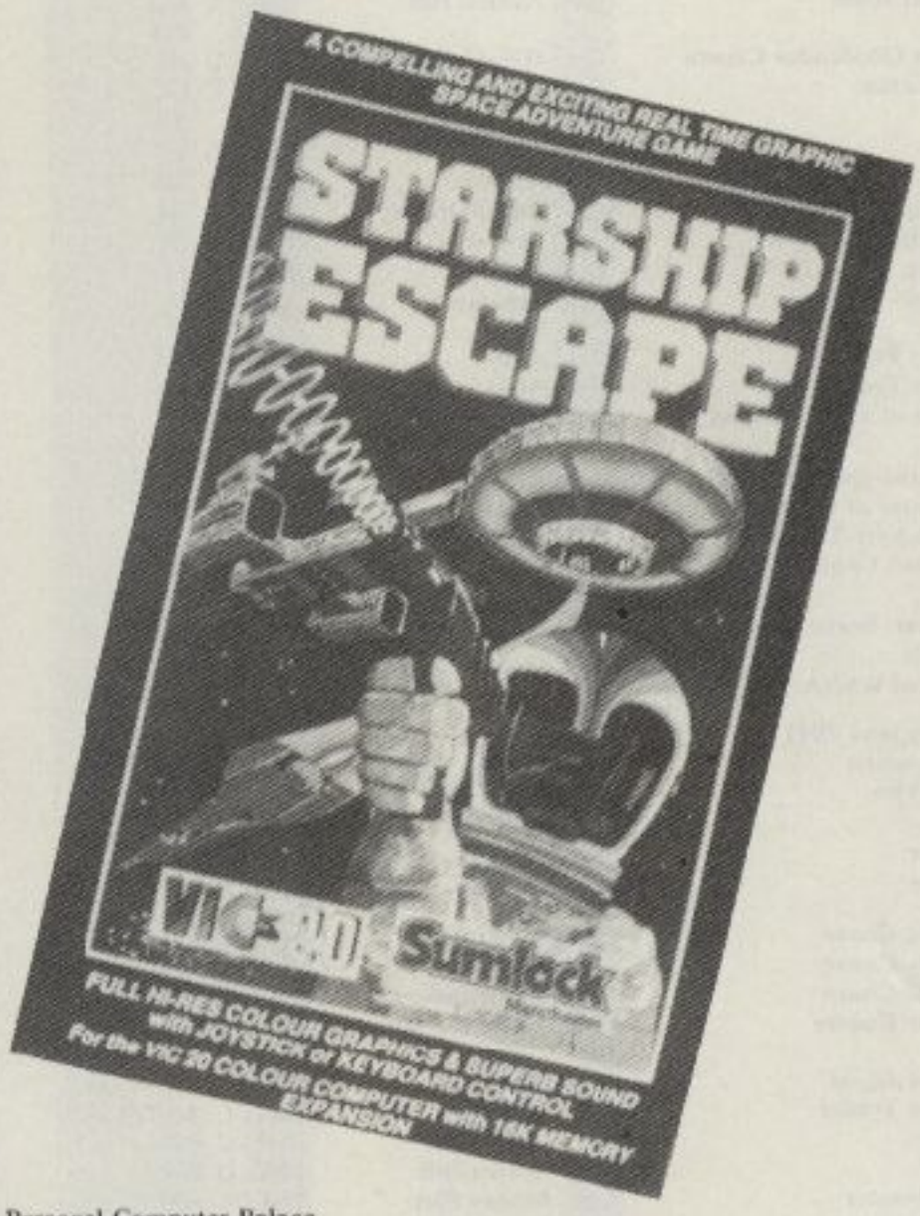
BS Computer Plus
47 Queens Road
Watford
Herts
WD1 2LH
0923 33927

BT The Essential Software Co.
(Visconti Ltd)
47 Brunswick Centre
London WC1
866 5445

BU Guestel
8-12 New Bridge Street
London EC4
583 2255

BV Lowe Electronics
Chesterfield 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

BO Sinclair Software
Sinclair Research Ltd
6 Kings Parade
Cambridge
CB2 1SN
0276 66104

BP Leicester Computer Centre Ltd
67 Regent Road
Leicester
LE16YF
0533 556268

BQ TABs Ltd
Sopers House
Chantry Way
Andover
Hants
SP10 12U
0264 58933

BX Abbey House
Bothwell Street
Gasgow
041-221-9372

BY Almarc Data Sytems Ltd
Great Freeman Street
Nottingham
NG3 1FR
0602 52457/8/9

BZ Interam Computer Systems Ltd
46 Balham High Road
London SW12
675 5325/6/7

CA Terodec Ltd
Unit 58
Suttons Park
Avenue
Earley
Reading
0734 664343/6

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,IK	£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,.K	£24.50
Super Breakout	Gm	Atari	16K	R	AB,IK	£35.95
T:A Text Display Device	Do	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
Tanktics	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,IK	£21.50
Tele Link	Ut	Atari	16K	R	AB,IK	£19.95
Telelink	Ut	Data Soft	16K	R	BC,IK	£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,IK	£24.95
Thunder Island	Gm	Analog S/W	16K	C	BC	£10.95
Touch Typing	Ed	Atari	16K	C	AC,BC,IK	£14.95
					AB,HM	£15.95
Tournament Pool and 8 Ball Pool	Gm	Thorn EMI	16K	C	CH,BC,HM IK	£19.95
Track Attack	Gm	Broada 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,IK	£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	Bs	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

SOFTWARE DEALERS

CB Poolsoft
17 Blatchington Road
Saford
East Sussex
0323 890604

CC Highlight Software
3 Nether Court
Halstead
Essex
0787 475714

CD Omega Plus
2c Graham Road
London E8 1B2

CE Southern Software
PO Box 39
Castleigh
Hants S05 5WQ

CF Sigma Systems
54 Park Place
Cardiff
Cardiff 21515/34869

CG Planet Software
10 Norton Drive
Eaton
Norwich

CH Brighton Gamer
24 Gloucester Road
Brighton
Sussex
0273 698424

CI Picturesque
6 Corkscrew Hill
West Wickham
Kent BR4 9BB

CJ 7 Lidgett Crescent
Roundhay
Leeds

CK Chrisalid
13 High Street
Berkanstad
Herts
74569

CL MED
1736 Church Hil Road
Thurmaston
Leicester
Leicester 704492

CM Simple Software
15 Havelock Road
Brighton
Sussex
0273 504879

CN Buffer Micro Shop
374A Streatham High Road
London SW16
769 2887

CO Pixel Productions
39 Ripley Gardens
London W1 48HF

CP Computics Microsoft
1 Bell Lane
Wheatley
Oxford
0X9 1XY

CQ KW Software
155 Ronginglow Road
Sheffield
S11 7PS

CR Sideline Freepost
Oxford 0X2 8BR

CS IQ Services
Canal House
Ardrigshaig
Argyll
Scotland
0546 3212

CT Willow Software
PO Box 6 Crediton
Devon
EX17 1DL

CU Level 9 Computing
229 Hughenden Road
High Wycombe
Bucks

CV J Perves
12 Stobhill Road
Gorebridge
Midlothian
EH23 4PL

CW Cambell Systems
Rous Road
Buckhurst Hill
Essex
IG9 6BL

CX Microdeal
Deal House
Bridges
Bodmin
Cornwall

CY Prof. F. H George
Bureau of Information Science
Commerce House
High Street
Chalfont St Giles
Bucks

CZ J Wolstencroft
Sagar Fold
Preston
Chipping (09956) 327

DA Ground Control
Alfreda Avenue
Hullbridge
Essex SS5 6LT
Southend (0702) 230324

DB Mick Bignell
01 953 8385

DC Giltrole Ltd
PO Box 50
Rugby
Warks CV21 4DH

DD Deep Thought Software
20 Chauntsinger
Alton
Hants

DE Silversoft
40 Empress Avenue
Ilford
Essex

DF Michael Orwin
26 Brownlow Road
Willesden
London NW10

DG Hisoft
60 Hallam Moor
Liden
Swindon
Wiltshire

DH The Soft Option
Bamberplan Ltd
PO Box 11
Cranbrook
Kent
058080 310

DJ Microcomputer Spacedrome
3 Westholm
London NW11
01 458 5845

DK Spider Software
98 Avondale Road
Wouth Croydon
Surrey
01 680 0267

DL Xavier Business Systems
7 North Lane
Clayton
Scarborough
Yorkshire
(0723) 583509

DM Camden Electronics
(Systems Division)
462 Coventry Road
Small Heath
Birmingham
021 773 8240/021 772 5718

DN Sumlock Electronic Services
Royal London House
198 Deansgate
Manchester
M3 3NE

DO Microstyle
29 Belvedere
Landsowne Road
Bath (0225) 334569

DP Small Systems Engineering Ltd
2-4Canfield Place
London NW6
01 328 7145

DQ Woodland Software
103 Oxford Gardens
W10 6NF
01 960 4877

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 Satelite	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	LC	£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	LC	£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 Telesytems Ltd
PO Box 12
Great Missenden
Bucks
HP16 9DD

DS Macronics
26 Spiers Close
Knowle
Solihull
West Midlands
B93 9ES

DT Hewson Consultants
7 Graham Close
Blewbury
Oxon
(0235) 850075

DU Silicon Office Servies
240 Durants Road
Enfield
Middx EN3 7AZ
01 805 0903

DV Sirton Computer Systems
Unit 14
29 Willow Lane
Mitcham
Surrey
01 640 6931

DW Psion Ltd
2 Huntsowrth Mews
Gloucester Place
NW1 6DD

DX JRS Software
19 Wayside Avenue
Worthing 65691 (evening and weekends only)

DY Calisto Computers Ltd
119 John Bright Street
Birmingham B1 1BE
021 632 6458

DZ Micro Gen
24 Agar Crescent
Bracknell
Berks
0344 27317

EA Anglia Computer Centre
88 St. Benedicts Street
Norwich
NR2 4AB
0603 25002

EB SBD Software
15 Jocelyn Road
Richmond TW9 2TJ
01 948 0461

EC Abacus Software
PO Box 7211
Grand Rapids
Michigan USA 49510

ED Qdos Business Software
9 Tintern Close
Streetly
Birmingham
021 353 0058

EE dK'tronics
23 Sussex Road
Gorleston
Great Yarmouth
Norfolk
(0493) 602453

EF Computech Systems
168 Finchley Road
London NW3 6HP
01 794 0202

EG Electronics Experts
Avondale Workshops
Woodland Way
Kingswood
Bristol
BS15 1QH

EH Artic Computing
396 James Reckitt Avenue
Hull HU8 0JA

EI Knights TV & Computers
108 Rosemount Place
Aberdeen
0224 630526

EJ Microage Electronics
135 Hale Lane
Edgware
Middx
01 959 7119

EK Holly Products
Blackthorn House
Dukes Lane
Gerrards Cross
Bucks

EL I O Systems
6 Laleham Avenue
Mil Hill
London NW7
01 959 0106

EM Merton Electronics
85/87 Station Road
W Croydon
680 8606

EN DaVinci Computer Shop
65 High Street
Edgware
Middlesex

EO Calco Software
Lakeside House
Kingstone Hill
Surrey
01 546 7256

EP Richard Francis
22 Foxhollow
Barhill
Cambridge

EQ Microtek Ltd
15 Lower Brook Street
Ipswich
Suffolk
(0473) 50512 or 52466

ER Diskwise Ltd
25 Fore Street
Callington
Cornwall
05793 3780

ES Control Technology
39 Gloucester Road
Gee Cross
Hyde
Cheshire
SK14 5JG
061 368 7558

ET Comp Shop
311 Edgware Road
London W2
01 262 0387

EU Micro Computer Products
Cambridge House
Cambridge Road
Barking
Essex IG11 8NT
01 591 6511

EV GW Computers
55 Bedford Court Mansions
Bedford Avenue
London WC1
01 636 8210

EW C/WP Computers
108 Rochester Row
London SW1P 1JP
01 828 3127

EX Metrotech Mail Order
Waterloo Road
Uxbridge
Middx
0895 588111 x 274/269

EY Microsystems Ltd
Summerfield House
Vale
Guernsey
0481 473377

EZ Superior Systems Ltd
178 West Street
S14ET
0742 755005

FA Control Universal Ltd
Unit 2
Andersons Court
Newnham Road
Cambridge
0223 358757

FB Pete & Pam Computers
98 Moyser Road
London SW16
01 677 2052/7341

FC Zenith Data Systems
Bristol Road
Gloucester
0452 29451

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

SOFTWARE DEALERS

FD Commodore Information
675 Ajax Avenue
Slough
Berks
Slough 79292

FE Logic Computers
31 Palmer Street
London SW1H OPR
01 222 1122/5492

FF Overseas Computer Systems Cons.
182a Queens Road
Watford
Watford 48580

FG Blyth Computers
Wenhaston
Halesworth
Suffolk
050 270 565

FH Taurus Computer Design
47 High Street
Baldock
Herts
SG7 6BG

FI HITEC
Zollergasse 15
A-1070
Vienna
Austria
01043 222 934331

FJ Graffcom Systems
102 Portland Road
Holland Park
London W11
01 727 5561

FK Electronic Aids
Mythe Crest
The Mythe
Twekesbury
Glos GL20 6EB
0386 831020

FL BUG-BYTE
98-100 The Albany
Old Hall Street
Liverpool

FM Learning Computer Systems
37 St Andrews Drive
Seaford
Sussex
BN25 2SB

FN Jentech Services Ltd
Nordley
Bridgenorth
Shropshire
WV16 4SU
07462 5287

FO Work Force
140 Wilsden Avenue
Luton
Beds
LU1 5HR

FP Twickenham Computer Centre
72 Heath Road
Twickenham
Middx
892 7896 or 891 1612

FQ Sbd Software
15 Jocelyn Road
Richmond
948 0461

FR Beebug
PO Box 50
St Albans
Herts
(Independent User Group for BBC Micro)

FS RAM Computer Services Ltd
15-17 North Parade
Bradford
0274 39116

FT Ozwise Computers
28 Crofts Road
Harrow
Middx HA1 2PH
01 863 2309

FU Compusense
PO Box 169
Palmers Green
London N13 4HT
01 882 0681

FV The Avery Computer Company
13 The Mall
Bar Hill
Cambridge
(Crafts Hill 80991)

FW Hilderbrey Ltd
8/10 Parkway
Regents Park
London NW1
01 485 1059

FX Micromedia
Vine Cottage
Tentelow Lane
Norwood Green
Middx
01843 9457

FY Wida Software
2 Nicholas Gardens
London W5 5HY
01 567 6941

FZ Superior Systems Ltd
178 West Street
Sheffield
0742 755005

GA Eltec Services Limited
231 Manningham Lane
Bradford
BD8 7HH
(0274) 491372

GB Anglo American Software
138a Stratford Court
Sparkhill
Birmingham
021 771 2995

GC Castle Electronics
15 Castle Street
Hastings
East Sussex
0424 437375

GD Quicksilva
95 Upper Brownhill Road
Maybush
Southampton
Hants
0703 771248

GE A&F Software
10 Wilpshire Avenue
Longsight
Manchester
061 320 5482

GF SRS Microsystems
161 Bramley Road
Oakwood
London N14 4XA
01 363 8060

GG Stirling Microsystems
241 Baker Street
NW1
01 486 7671

GH Microtanic Software
234 Dulwich Road
London OBD
01693 7659

GI Lander Microsystems
32 Clokchouse Lane
Collier Row
Romford Essex
Romford 26325

GJ Computer Concepts
16 Wayside
Chipperfield
Herts
09277 62955

GK Program Power
5 Wensley Road
Leeds LS7 2LX
0532 683186

GL Syrtis Sofware
23 Quantock Road
Bridgewater
Somerset

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	JT	£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	JT	£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	IM	£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/Disasembler	Ur	Hewson	16/48K	C	DT	£8.95
Associateive Database System	Do	Docimodus	16K	C	HE	£15.00
Asteroids	Gm	Abbex 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

GP C C Soft
83 Longfield Street
Soutfields
London SW18

GQ Microx
52 The Strand
Worthing
Sussex
Worthing 49584

GR Pro Software
121 Tyn-Y-Twr
Baglan
Port Talbot
West Glamorgan
SA12 8YE

GS Sussex Software
Wallsend House
Pevense; Bay
East Sussex

GT Rose Cassettes
148 Widney Lane
Solihull
West Midlands
B91 3LH

GU Axis
71 Brockfield Avenue
Loughborough
Leics
LE11 3LN

GV PR Software
28 The Fairway
South Ruislip
Middx
HA4 0RY

GW Bridge Software
36 Fernwood
Marple Bridge
Stockport
Cheshire
SK6 SBE

GX Video Software Limited
Stone Lane
Kinver
Stourbridge
West Midlands
Kinver 2462

GY J M Steadman
6 Carros Close
Leightor Buzzard
Beds LU7 7XB

GZ Transform Ltd
41 Keats House
Porchester Mead
Beckenham
Kent
01 658 1661

HA Baust Computing Consultants
31 Peak Lane
Fareham
Hants PO14 1RX
0329 281480

HB University Computers
5 St Barnabas Road
Cambridge CB1 2BU

HC Educare
139a Sloane Street
London SW1X 9AY

HD Simon Software
Freepost
New End
Redditch

HE Docimodus
161 Walmersley Road
Bury
Lancashire
BL9 5DE

HF M C Associates
4 Granby Road
Cheadle Hulme
Cheshire SK8 6LS

HG Addictive Games
PO Box 278
Conniburrow
Milton Keynes
MK14 7NE

HH J K Greye Software
16 Park Street
Bath
Avon
BA1 2TE

HI John Prince
29 Brook Avenue
Levenshire
Manchester M19

HJ Titan Programs
83 Ashwood Road
Rudloe
Corsham
Wiltshire
SN13 0LG
(0225) 810132

HK Micro Computer Softare
Unit D6
Pear Industrial Estate
Stockport Road
Lower Bredbury
Stockport
SK6 2BP
061 494 2441

HL Phipps Associates
99 East Street
Epsom
Surrey
KT17 1EA

HM Gemini Electronics
50 Newton Street
Manchester M1
061 236 3083

HN The Vic Centre
154 Victoria Road
Acton
London
W3 6UL
01-992-9904

HP R & R Software
34 Bourton Road
Gloucester
GL4 OLE
0452-502819

HQ Town Book & Toys
15 Eastgate Street
Gloucester
Glcs

HR Screen Scene
144 St Georges Road
Cheltenham
Glcs

HS Software Masters Ltd
30 Lincoln Road
Olton
Birmingham

HT John Prince Software
29 Brook Avenue
Levenshulme
Manchester M19

HU Nick Godwin
4 Hurkur Crescent
Eyemouth
Berwickshire
TD14 5AP

HV A Parsons
23 Coxhill Gardens
River
Dozer
Kent

HW Bryants (Educational) Software
1 The Hollies
Chalcroft Lane
North Berstead
Bognor Regis
West Sussex
PO21 55X

HX Abersoft
7 Maes Afallen
Bow Street
Dyfed
SY24 5BA

HY D.C. Roberts
107a Royal George Road
Burgess Hill
Sussex

HZ Hard & Soft
85 Snowdown Avenue
Hillingdon
Middx
UB10 0SE

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 48K	C	OV	£6.50
Bomber	Gm	Llamasoft	16K	C	KG	£2.95
Business Bank Account	Bg	Transform	16K 48K	C	GZ	£8.75
Business Model Modeller X	Bg	Cases Computer Simulations	16K	C	KZ	£8.00
Business Pack	Bg	Transform	16K 48K	C	GZ	£25.00
Breaker	Gm	Wizard	48K	C	PA	£3.50
Cabman	Gm	Micro Power	16K	C	OZ	£3.95
Centipede	Gm	dK'tronics	16/48K	C	EE	£4.95
Chess	Gm	Artic	48K	C	EH	£9.45
City	Gm	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	Gm	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	Gm	Martech Games	48K	C	PE	£9.50
Cosmos	Gm	Abbex Electronics	16K	C	OT	£4.95
Count-down	Ed	AVC Software	16K	C	IM	£3.00
Crevasse/Hotfoot	Gm	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	Gm	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	Abbex 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	Abbex 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	Gm	Artic	16K	C	EH	£3.95
Galaxy Conflict	Gm	Martech Games	48K	C	PE	£9.50
Galleons	Gm	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
Gobbleman	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
Greph	Ut	Spectre Soft	16K	C	JJ	£4.95
Graphics Creator	Ut	Llamasoft	16K	C	KG	£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	Abbex Electronics	16K	C	OT	£5.95
Headbanger	Gm	Llamasoft	48K	C	KG	£4.95
High Noon	Gm	Abbex 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 Skiing	Gm	Psion	16/48K	C	DW	£5.95
Hungry Horace	Gm	Psion	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	Abbex Electronics	16K	C	OT	£5.95
Inventions 1	Ed	ICL	16K	C	OX	£6.95

SOFTWARE DEALERS

1A Microdeal
Deal House
Luxulyan
Bodmin
Cornwall
PL30 5E
0726-850-821

1B Aztec Software
25 St Mark Road
Deepcar
Sheffield
S30 5TS

1C Orgre Games & Software
Fantasy Department
47 Chislehurst Avenue
Liverpool 25
Merseyside

1D Tridata Micro's Ltd
Smithfield House
Digbeth
Birmingham
B5 6BS
021-662 6085/6

1E Plympton Computer Services
5 Turnbill Gardens
Plympton
Plymouth
Devon
PL7 3XF
0752-330176

1F Electronics Applied
4 Dromore Road
Carrickfergus
Co Antrim
BT38 7PJ

1G Emjay
17 Langbank Avenue
Rise Park
Nottingham
NG5 5BU

1H Kansas City Systems
Unit 3
Sutton Springs Wood
Chesterfield
0246-850357

1I Serious Software
7 Woodside Road
Bickley
Bromley
Kent
BR1 2ES

1J Computercat
224 Chapel Street
Leigh
Lancashire
WN7 2DW
0942-605730

1K Silica Shop
1-4 The Mews
Hatherly Road
Sidcup
Kent DA14 4DX

1L V & H Computer Services
182c Kingston Road
Staines
Middx

1M AVC Software
PO Box 415
Harborne
Birmingham
B17 9TT

1N Computator
3 Thalia Close
Greenwich
SE10 4NA

1O Omega Electronics
37 Chichester Square
Carrickfergus
Co Antrim
BT38 8JU

1P A.V.O. Software Distribution
131 Lord Street
Hoddesdon
Hertfordshire
EN11 8NG

1Q Big Softie
5 Aston Park
Finaghy
Belfast
BT10 0JQ

1R Adamsoft
18 Norwich Avenue
Rochdale
Lancs OL11 5JZ

1S Microcomputer Applications
41 Queens Road
Blandford Forum
Dorset
DT11 7LA

1T I.J.K. Software
55 Fitzroy Road
Bisphan
Blackpool
Lancs

1U Aardvark Software
15 Queensbury Avenue
Hartlepool
Cleveland
TS26 9NW

1V James Hager
7 Basset Street
Cambourne
Cornwall

1W Simon Hessel Software
15 Lytham Court
Cardwell Crescent
Sunninghill
Berkshire

1X Mayday Software
181 Portland Crescent
Stanmore Middx
HA7 1LR

1Y Persoft
Freepost
Baildon
Shipley
West-Yorkshire
BD17 6EQ

1Z Micro-Aid
25 Fore Street
Praze-An-Beeble
Cambourne
Cornwal
TR14 0JX

JA Hexagon Software
17 Cambridge Green
Otley

JB N. Darwood Ltd
Halfacres
Stroud
Petersfield
Hampshire

JC Futura Software
63 Lady Lane
Chelmsford
Essex
CM2 0TQ

JD

JE Ultra-Tech Services
30a Billing Road
Northampton
NN1 5AZ

JF 9 Franklin Road
Saltcoats
Ayrshire
KA 21 5AT

JG Gary Smith
'Brynllwyd'
Capel Seion
Aberystwyth
Dyfed

JH Aquarius Software
53 Towncourt Crescent
Petts Wood
Kent
BR5 1PH

JI Precision Software Engineering
20 Shelton Avenue
Newark
Notts
NG24 4NX

JJ Spectre Soft
Dunelm Cottage
Maltmans Lane
Gerrards Cross
SL9 8RS

JK Cornhill Services
2 Penrith Way
Aylesbury
Bucks
HP21 7JZ

JM Morris Associates (Computing)
37 St Catherines Road
Baglan
Port Talbot
SA12 8AT

REFERENCE

SOFTWARE LISTING

ZX SPECTRUM

Title	Program Type	Program Produced By	Memory Req'd	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 Disassembler	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
Pharoah'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
Renumber 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	Llamesoft	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

JO Mossoft Microcomputer Software
10 Garden Street
Norwich
Norfolk
NR1 1QX

JP Romik
24 Church Street
Slough
SL1 1PP

JQ David Computer Software
38 South Parade
Bramhall
Stockport
SK7 3BJ

JR Creative Software
48 Hartlip Hill
Newington
Sittingbourne
Kent
ME9 7NZ

JS Allrian Data Services
100a Uxbridge Road
Hayes
Middx
UB4 ORL

JT Apex Trading Ltd
115 Crescent Drive South
Brighton
BN2 6SB

JU TX Software
109 Abbotsweld
Harlow
Essex
CM18 6TQ

JV Hopesoft
Hope Cottage
Winterbourne
Newbury
Berks
RG16 8BB

JW GT Software
8 Bull Street
Potton
Sandy
Bedfordshire
SG19 2NR

JX Garland Computing
35 Dean Hill
Plymouth
PL9 9AF

JY Corona Software
Corona House
21 Tennyson Avenue
London
E11 2QN

JZ MP Software & Services
165 Spital road
Bromborough
Merseyside
L62 2AE

KA Ludinski Computer-Assisted Learning
26 Avondale Avenue
Staines
Middlesex
0784-58771

KB B.B.C. Publications
The British Broadcasting Corporation
35 Marylebone High Street
London
W1M 4AA

KC Miking Software
28 New Road
Northbourne
Bournemouth
Dorset
BH10 7DS

KD Inverse
'Orchard View'
Droitwich Road
Fernhill Heath
Worcester
WR3 7TZ

KE Alan Turnbull
65 Vicarage Road
Cale Green
Stockport
Cheshire

KF Chromasoft

KH Llamasoft Computer Software
49 Mount Pleasant
Tadley
Hants
07356-4478

KH Superior Software
69 Leeds Road
Bramhope
Leeds
0532-842714

KI Earthshock Software
15 Eden Avenue
Wakefield
WF2 9DJ

KJ Bridge Software
36 Fernwood
Marple Bridge
Stockport
Cheshire
SK6 5BE

KK ME & P Micro Products
The Old Oast House
Malting Lane
Cambridge
CB3 9HF

KL Calpac Computer Software
108 Hermitage Woods Crescent
St Johns
Woking
Surrey
GU21 1UF

KM KCET Software
17 Torry Drive
Alve
0259 60840

KN Soltare for All
72 North Street
Romford
0708-60725

KO Rucksoft
10 The Moorlands
Hanley Road
Malvern Wells
Worcestershire
WR14 4PS

KP Liverpool Computer Centre

KQ W. E. Hunt

KR ABC Software

KS Rainbow Software

KT Chalksoft
Lowmoor Cottage
Toaedale Wellington
Somerset TA2 OAL

KU Wizard Software

KV Data Brain Software

KW NCG Ltd,
Letlergesh
Renvyle,
Co Galway
Republic of Ireland

KX Broadwater Economic Simulations
24 Hill Barn Lane
Worthing
West Sussex

KY Kent Computer Company
Alders of Bromley
High Street
Bromley
Kent

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

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
Spectsound	Do	PDQ Software	16K	C	QG	£5.95
Spookyman	Gm	Abbex 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
Statistics	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	Llamasoft	48K	C	KG	£4.95
Super Glooper/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	Bg	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 Greye	16K	C	CN	£4.95
Adventure	Gm	Anglo American	16K	C	GB	£6.00
Adventure A	Gm	Artic	16K	C	EH,BT,CN AB	£6.00 £8.00
Adventure B	Gm	Artic	16K	C	EH,BT,CN AB	£7.00 £8.00
Adventure C	Gm	Artic	16K	C	AB,CH,BT,EH	£8.00
Adventure I	Gm	Abbersoft	16K	C	CN	£9.95
Angle	Ed	AVC Software	16K	C	IM	£3.00
Adventure	Gm	Abersoft	16K	C	CN,HX	£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

SOFTWARE DEALERS

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
Llanelli
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 7RQ

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
Beverly
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

PT Oxford Computer Publishing
PO Box 99
Oxford

PQ Mikro Gen
24 Agar Crescent
Bracknel
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 0BW

PX Melbourae 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
Cheadle Hume
Cheadle
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	Prices
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-Scaramble						
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						
Sorceror'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						
Silvelte						
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						
Cassette G9	Gm	Psion	15K	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	15K	C	HW	£1.87
Centipede	Gm	dK'tronics	15K	C	EE,CN	£4.95
Centipede (Graphics)	Gm	dK'tronics	15K	C	EE	£4.95
Champions Quiz	Ed	Rose Cassettes	16K	C	CN	£4.50
Character Predictor	Do	Hard & Soft	1K 3K	C	HZ	£3.95
Chess	Gm	Micro Gen	16K	C	DZ	£6.50
Chess Board	Gm	Hard & Soft	1K	C	HZ	£3.95
Chess 1.4	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	Pizzel	16K	C	CN	£5.50
Critical Path Analysis	Bs	Hilderbay	16K	C	FW	£15.00
Crystal Ball	Do	Hard & Soft	1K 3K	C	HZ	£3.95
Cursor Input	Ut	Serious S/W	1K 16K	C	II	£2.95
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 S/W	Do	Micro Computer	16K	C	HK	£4.99
Diggles Kitchen Vol 1 S/W	Do	Micro Computer	16K	C	HK	£4.99
Diggles Kitchen Vol 2 S/W	Do	Micro Computer	16K	C	HK	£4.99
Diggles Kitchen Vol S/W	Do	Micro Computer	16K	C	HK	£4.99
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 1	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

SOFTWARE DEALERS

QH Fuller Micro Systems
The ZX Centre
Sweeting Street
Liverpool 2

QI Video Software
Stone Lane
Kinver
Stourbridge
West Midlands

QJ Tasman
17 Harley Crescent
Leeds
LS6 2LL

QK Kricon Ltd
11 Medway
Hailsham
East Sussex
BN27 3HE
0323 846110

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.

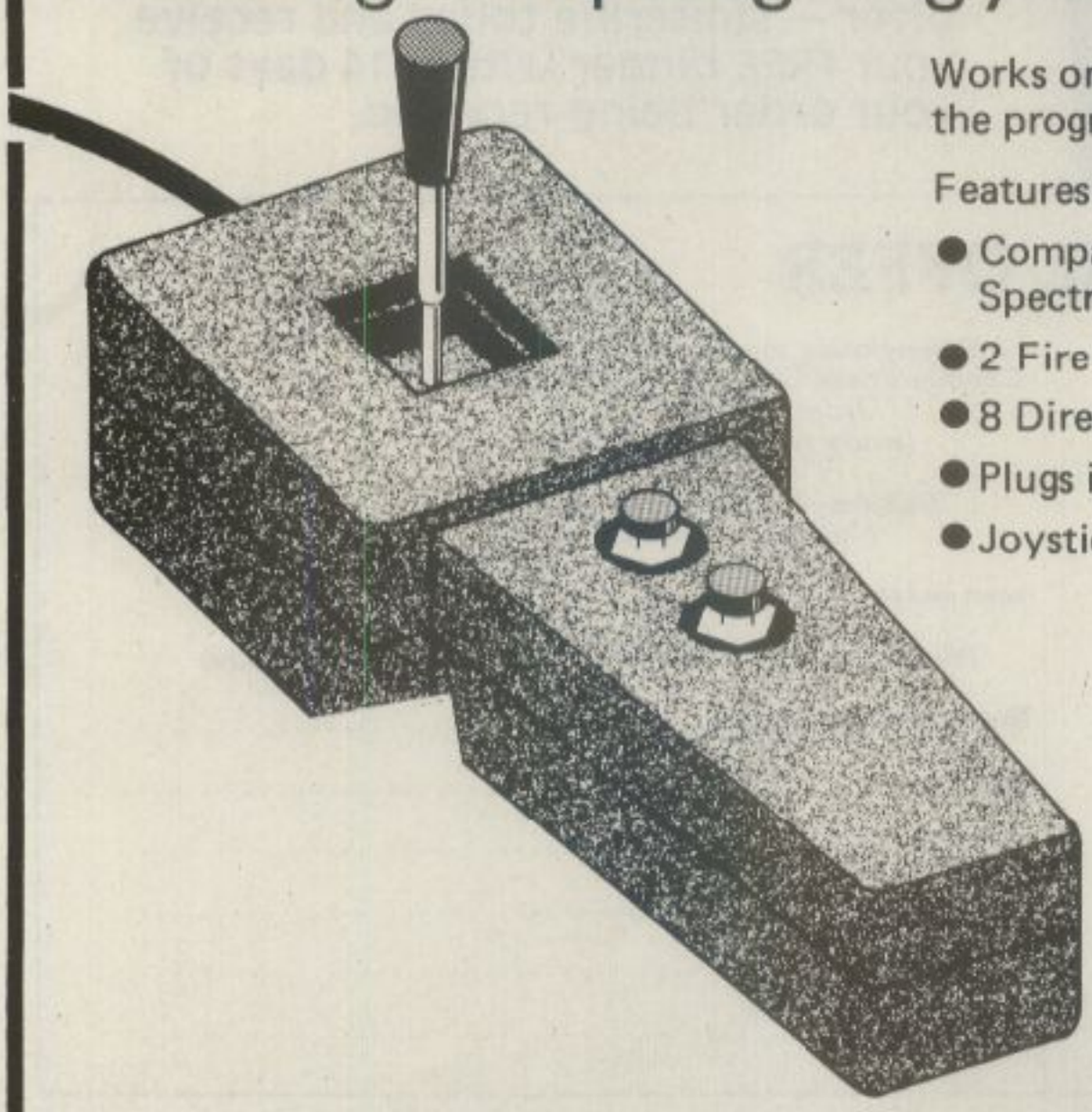
We'd like you to help us keep advertising up to standard.

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 .....

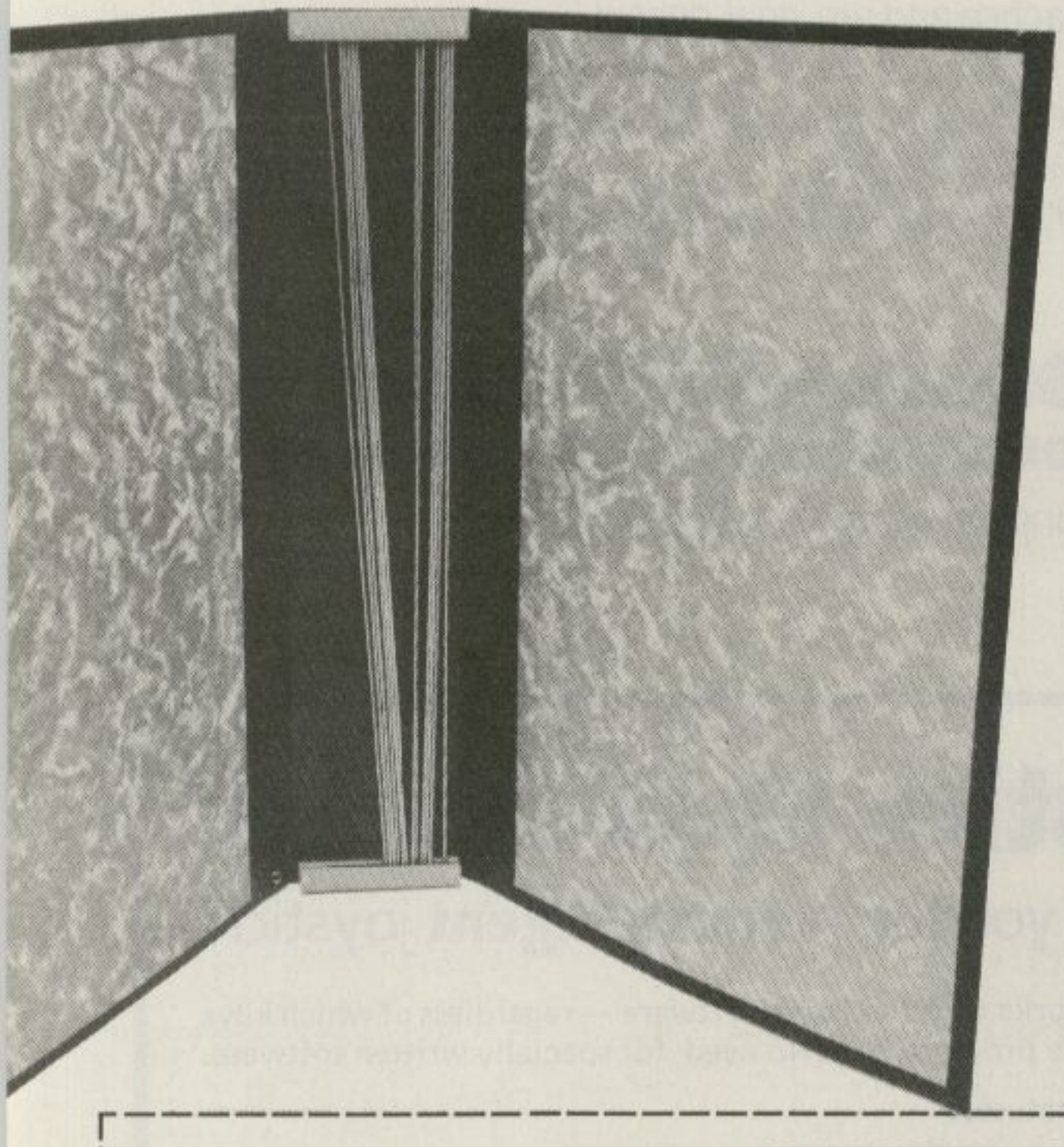
.....

Please send me.....joysticks @ £26.00 for the Spectrum ☐ ZX81 ☐ Jupiter Ice ☐

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

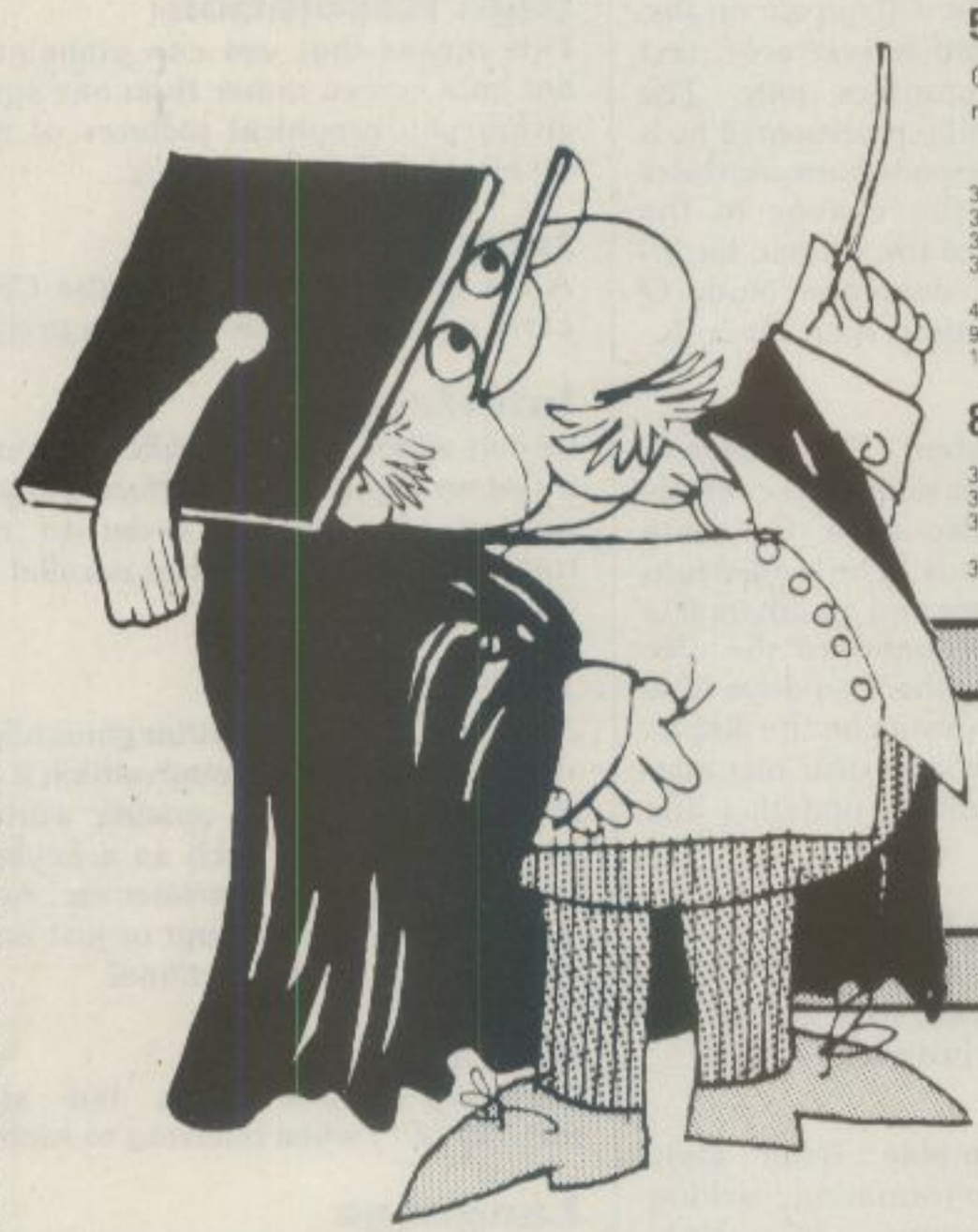
EDUCATIONAL SALES DEPARTMENT
Liphook, hants, GU30 7EJ, U.K.
TEL (0428) 722563 TELEX 849131 G

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.



5¼" 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 efficent 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 O 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 for1024 (2^{10}) 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 *microprocessor* 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 independantly of any other programs and adds commands to the machines 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 acvertisement 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
Freepost, 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 instructions allowing you to be back in action in seconds. Send £2.50 pair 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
DEPTPCT50 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, Stourbridge, West Midlands DY8 1QG. Tel: (03843) 5333/2545

SERVICES

COMPUTER & PERIPHERAL SERVICES, ASHTEAD 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 Worcestershires finest Hotels and learn "Basic" on Commodore 64's. All rooms have bath, colour T.V. 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 PRICES

WE WILL PURCHASE AND PUBLISH YOUR PROGRAMS Call Steve Rhodes for details

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

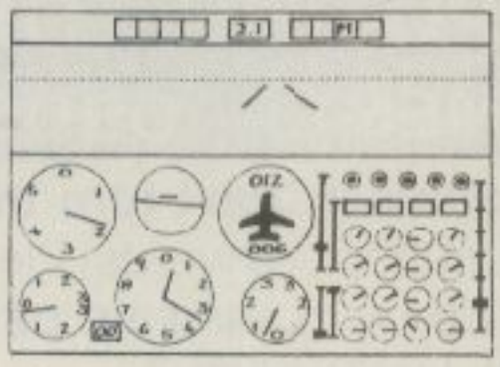
PROGRAMMERS
SOFTWARE AND HARDWARE PRODUCERS U.S. MARKET

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 professional marketing strategy.
Send information, proposals, and samples to:

IC 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 instrumentation 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 see 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			PRICE
	ADVENTURES		
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
	GAMES		
2001	STAR TREK Find the enemy and distroy him	16K	7.00
2002	A-MAZE-IN Seek and destroy the monsters in the maze as quickly as you can could take you hours	16K	10.00
2004	OWNERSHIP Similar to MONOPOLY	32K	10.00
2006	GAMES PACK 1 5 Different games	4K	5.00
2007	GAMES PACK 2 5 Different games	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, Cheadle 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, Peltcn, 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 challanging 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 gull 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 **£25.00**, 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, Rhosleigh Ave, Sharples 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, Ingleton, 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, Ayestone, 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/Interrational Money Order for: (delete as necessary) £. . . . (Made payable to A.S.P. Ltd)

VISA OR Debit my Access/Barclaycard (Delete as necessary) We welcome Access

All classified advertisements must be paid for in advance.

Please use BLOCK CAPITALS and include post codes.

Name (Mr/Mrs/Miss/Ms) ..... (delete accordingly)

Address .....

.....

.....

Signature ..... **Date** .....

Daytime Tel. No. .....

PLEASE MENTION PERSONAL COMPUTING TODAY WHEN REPLYING TO ADVERTISERS

ACORN SOFT 33
ANIROG COMPUTERS 14
A B & C COMPUTING 60
AKHTER INSTRUMENTS 25
ARCADIA SOFTWARE 46
ACORN PERIPHERALS 69
BAMBY SOFTWARE 83
BI-PAK 6
BUFFER MICRO SHOP 11
BYTEWELL 94
CHEETAH MARKETING LTD 68
COMPUSOUND 93
COMPUTER HOUSE 53
CASCADE 52
CANDLEFORD 94
CRL 42
CARNELL SOFTWARE 13
CASTLE ELECTRONICS ..... IBC
CAMEL MICROS 6
CLWYD TECHNICS 11
CLWYD PERSONAL COMPUTERS 77
CLARES 83
CAMBRIDGE COMPUTERS 107
DISKING 109
DA COMPUTERS LTD 6
ELITE ELECTRONICS 76
FROST SUPPLIES 83
FOILKADE LTD 20
GEM SOFTWARE 76
GAMER 77
GENERAL NORTHERN 20
JRS SOFTWARE 93
JCB MICROSYSTEMS 11
LASERBUG 94
LEVEL 9 COMPUTING 15
MICRO MANIA 28
MR CHIP SOFTWARE 93
MARKETING MICRO SOFTWARE 21
MEMOTECH ..... 34 & 35
MICRO-DEAL 27
MICRO-CELL COMPUTER SYSTEMS 29
M. P. SOFTWARE 46
MIJID 75
NAMAL 15
ORWIN SOFTWARE 46
ORIC PRODUCTS ..... 70 & 71
PRO SOFTWARE 46
PHEONIX PUBLISHING 76
PLUS 80 56
QUEST MICRO SOFTWARE 45
RICHARD SHEPHERD 47
REDSHIFT LTD 10
REDDITCH ELECTRONICS 93
READOUT/NEWTECH 7
ROBERT CLEARY 94
SPARTAN SOFTWARE 52
STACK 11, 13, 15
SIR COMPUTERS 19
SOLAR SOFTWARE 18
SWANLEY ELECTRONICS 77
SOFT JOES ..... HFC
SILICA SHOP ..... OBC
SINCLAIR RESEARCH 61, 62, 63, 64
THE DRAGON DUNGEON 28
THORN EMI ..... 54 & 55
TERMINAL SOFTWARE 83
THE SOFTWARE FARM 24
3D COMPUTERS 24
UTS 77
ULTIMATE PLAY THE GAME 41
VELTOMAX 18
WINDRUSH 107

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

SPECIAL VALUE LIMITED OFFER

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, Casstte Unit C2N - £44.95, Also available - extra RAM, hi-res cartridge Joysticks, Paddles.

ALL PRICES INCLUDE VAT

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

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

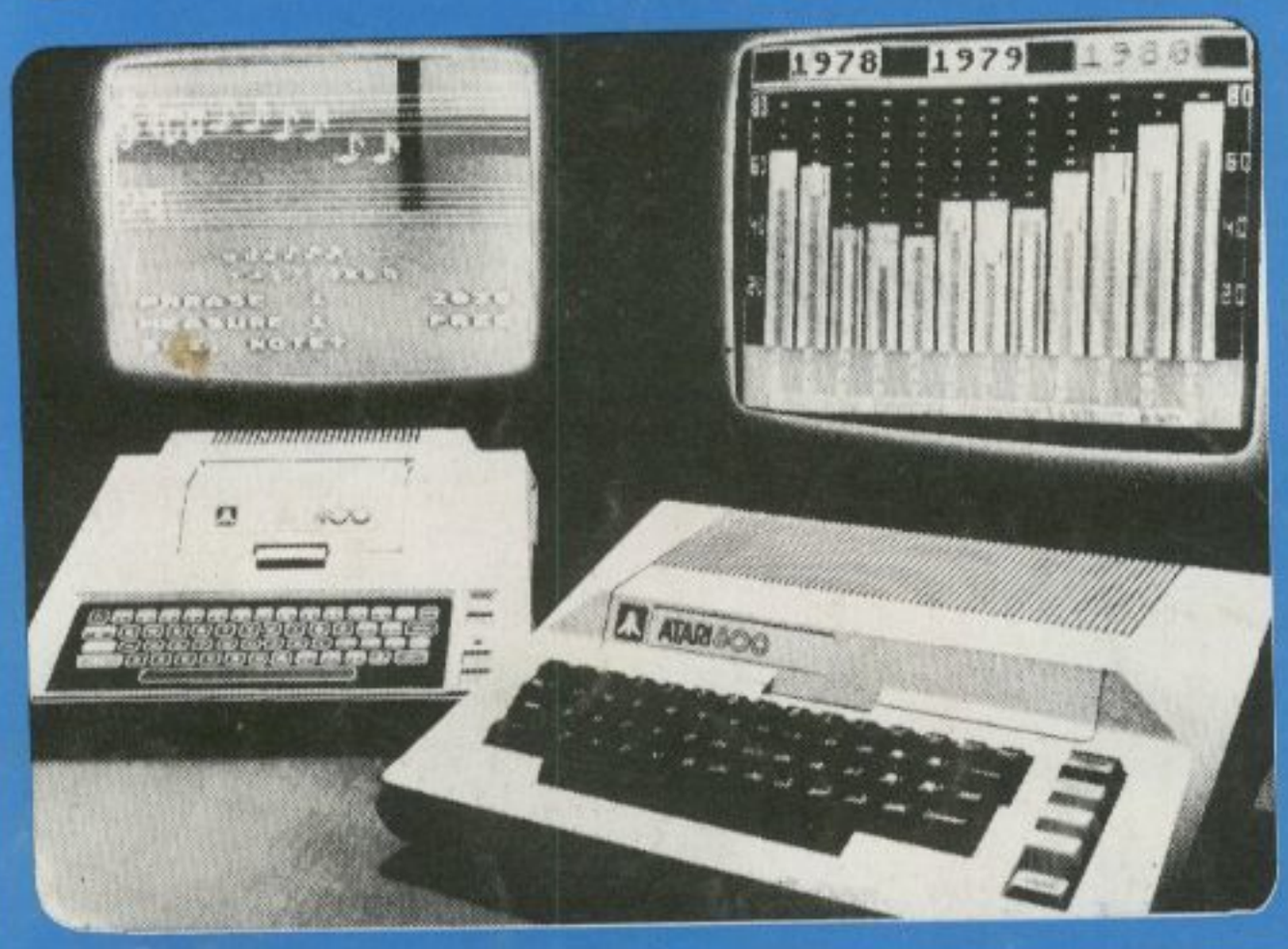
(0424) 437875

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



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:

ACCESSORIES
Cables
Cassettes
Diskettes
Joysticks
Le Stick - Joystick
Misc Supplies
Paddles

ADVENTURE INT
Scott Adams Adv
No 1 Adventureind
No 2 Pirate Adv
No 3 Mission Imp
No 4 Voodoo Cast
No 5 The Count
No 6 Strange Odyr
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
Mountain Shoot
Rearguard
Star Flite
Sunday Golf

AUTOMATED SIMULATIONS
Crush Crumble Cmp
Datestones of Ryn
Dragons Eye
Invasion Orion
Rescue at Rigel
Ricochet
Star Warrior
Temple of Apshai
Upper Reaches Aps

BOOKS
Basic Ref Manual
Compute Atari DOS
Compute Bk Atari
Compute Magazine
De Re Atari
DOS Utilities List
DOS2 Manual
Misc Atari Books
Op System Listing
Wiley Manual

BUSINESS
Calculator
Database Managemt
Decision Maker
Graph-It
Invoicing
Librarian
Mort & Loan Anal
Nominal Ledger
Payroll
Personal Finl Mgmt
Purchase Ledger
Sales Ledger
Statistics 1
Stock Control
Telelink 1
Visicalc
Weekly Planner
Word Processor

CRYSTALWARE
Beneath The Pyram
Fantasyland 2041
Galactic Quest
House Of Usher
Sands Of Mars
Waterloo
World War III

DYNACOMP
Alpha Fighter
Chompelo
Crystals
Forest Fire
Intruder Alert
Monarch
Moonprobe
Moving Maze
Nominoes Jigsaw
Rings of The Emp
Space Tilt
Space Trap
Stud Poker
Triple Blockade

EDUCATION from APX
Algicalc
Atlas of Canada
Cubbyholes
Elementary Biology
Frogmaster
Hickory Dickory
Inst Comptg Dem
Lemonade
Letterman
Mapware
Maths-Tac-Toe
Metric & Prob Solvg
Mugwump
Music Terms/Notatn
Musical Computer
My First Alphabet
Number Blast
Polycalc
Presidents Of U.S.
Quiz Master
Starware
Stereo 3D Graphics
Three R Math Sys
Video Math Flash
Wordmaker

EDUCATION from ATARI
Conv French
Conv German
Conv Italian
Conv Spanish
Energy Czar
European C & Caps
Hangman
Invit To Prog 1/2/3
Kingdom
Music Composer
Scram
States & Capitals
Touch Typing

EMI SOFTWARE
British Heritage
Cribbage/Dominoes
Darts
European Scene Jig
Hickory Dickory
Humpty Dumpty
Jumbo Jet Lander
Snooker & Billiards
Submarine Commdr
Super Cubes & Til
Tournament Pool

ENTERTAINMENT from APX
Alien Egg
Anthill
Attank
Avalanche
Babel
Blackjack Casino
Block Buster
Block 'Em
Bumper Pool
Castle
Centurion
Checker King
Chinese Puzzle
Codecracker
Comedy Diskette
Dice Poker
Dog Daze
Domination
Downhill
Eastern Front
Galahad & Holy Grl
Graphics/Sound
Jax-O
Jukebox
Lookahead
Memory Match
Midas Touch
Minotaur
Outlaw/Howitzer
Preschool Games
Pro Bowling
Pushover
Rabbotz
Reversi II
Salmon Run
747 Landing Simul
Seven Card Stud
Sleazy Adventure
Solitaire
Space Chase
Space Trek
Sultans Palace
Tact Trek
Terry
Wizards Gold
Wizards Revenge

ENTERTAINMENT from ATARI
Asteroids
Basketball
Blackjack
Centipede
Chess
Entertainment Kit
Missile Command
Pac Man
Space Invaders
Star Raiders
Super Breakout
Video Easel

ON LINE SYSTEMS
Crossfire
Frogger
Jawbreaker
Mission Asteroid
Mouskattack
Threshold
Ulysses/Golden Fl
Wizard & Princess

PERIPHERALS
Centronics Printers
Disk Drive
Epson Printers
Program Recorder
RS232 Interface
Thermal Printer
16K Memory RAM
32K Memory RAM

PERSONAL INT from APX
Adv Music System
Banner Generator
Blackjack Tutor
Going To The Dogs
Keyboard Organ
Morse Code Tutor
Personal Fitness Prg
Player Piano
Sketchpad

PROGRAMMING AIDS from Atari
Assembler Editor
Dsembler (APX)
Microsoft Basic
Pascal (APX)
Pilot (Consumer)
Pilot (Educator)
Programming Kit

SANTA CRUZ
Basics of Animation
Bobs Business
Display Lists
Graphics Machine
Kids 1 & 2
Horizontal Scrolling
Master Memory Map
Mini Word Processor
Page Flipping
Player Missile Gr
Player Piano
Sounds
Vertical Scrolling

SILICA CLUB
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**—

Silica Shop

For free brochure and reviews on our range of electronic products, please telephone 01-301 1111. To order by telephone, just quote your name, address, credit card number, and order requirements and leave the rest to us. Post and packing is FREE OF CHARGE in the UK. Express 24 hour delivery available at an additional charge.

- SHOP DEMONSTRATION FACILITIES – we provide full business at our shop in Sidcup, Monday to Saturday 9am to 5.30pm (closing Thursday 1pm, Friday 6pm).
- MAIL ORDER – we are a specialist mail order company and are able to supply goods direct to your door.
- MONEY BACK UNDERTAKING – if you are totally unsatisfied with your purchase you may return it to us within 15 days. On receipt of the goods in satisfactory condition we will give you a full refund.
- PART EXCHANGE SECOND HAND MACHINES – we offer a part exchange scheme to trade in many makes of T.V. games for personal computers.
- COMPETITIVE PRICES – our prices, offers and service are very competitive. We are never knowingly undersold, and will normally match any lower price quoted by our competitors.
- HELPFUL ADVICE – available on the suitability of various computers.
- AFTER SALES SERVICE – available on all computers out of guarantee.
- VAT – all prices quoted above include VAT at 15%.
- CREDIT FACILITIES – we offer 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